

THEATRE

The needle in Newton's eye

A play about Isaac Newton's self-experimentation illuminates scientific rivalry, finds **Alla Katsnelson**.

Non-biodegradable products, such as glass bottles and television sets, can be recycled in safe, perpetual cycles, eliminating the need to use anything but recyclable raw materials. These metals, rare elements and approved synthetic materials do not physically degrade, and because they are not discarded will not come into direct contact with the environment.

Leasing and take-back systems (in which the manufacturer recycles the used product) are another way of making upcycling work, partly because they allow the use of higher-quality recyclable material that can take more wear. Companies already lease cars, but carpets — traditionally laden with chemicals such as chlorinated pigments, which persist in the environment and are often toxic — can also have many incarnations. The Dutch carpet manufacturer Desso, based in Waalwijk, makes polyvinyl chloride (PVC)-free carpets that improve air quality, because the patented fibres capture particulate matter from the atmosphere. Desso's take-back system even extends to PVC-free carpets that have been produced by other companies. In recycling, the carpet backing is reused and the yarn is rewoven into new carpets.

Raw materials and energy supplier Van Gansewinkel, headquartered in Eindhoven, the Netherlands, goes one step further. The company helped the Dutch mattress manufacturer Auping to design a take-back system for traditional mattresses as well as their own recyclable products. The steel in the mattresses is melted and reused; the foam is recycled as judo mats. Van Gansewinkel has also developed a continuous loop of high-quality recycling for office paper. It collects used paper from customers, sends it to the paper company Steinbeis in Stuttgart, Germany, for sustainable recycling, and with its partner Océ, based in Venlo, the Netherlands, supplies customers with the 100% recycled paper.

Nature does not respond to interdependence by seeking to minimize itself out of existence, but by growing and flourishing. Similarly, the key to generating a productive and sustainable economy is not through strategies of damage control and minimization, but through nourishing the industrial metabolism. ■

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Scientists occasionally conduct experiments on themselves. Among the most famous was Isaac Newton's extraordinary method for probing the nature of colour. He stuck a bodkin, a long sewing needle with a blunt point, into his eye socket, between eye and bone, and recorded seeing coloured circles and other visual phenomena. In his new play, *Isaac's Eye*, Lucas Hnath uses this bizarre experiment to explore scientific rivalry, the nature of truth and knowledge, and how the narratives of science and life congeal.

Isaac's Eye headlines the fifteenth annual First Light festival, a collaboration between the Alfred P. Sloan Foundation and the Ensemble Studio Theatre in New York to fund drama that explores scientific concepts and personalities. Hnath has looked to science for creative fodder since his undergraduate days at New York University. His first such work, which won a Sloan-sponsored writing competition, was a screenplay whose protagonist, computer scientist Adan Turner, finds himself imitating Alan Turing.

"I tend to write characters who try to push some kind of limit — who are trying to experience something that no one has ever before experienced," he says. "Inevitably, you have to deal with science if you go in that direction."

In his new drama, Hnath plays with history, presenting a fictional backstory to the legendary conflict between Newton, when he was still unknown, and the well-respected physicist Robert Hooke. "There's a law named after me," Hooke brags repeatedly throughout the play. In 1665, when the play is set, the plague is ravaging England while an ambitious Newton is being eaten away by the desire to join the Royal Society. Newton writes repeatedly to Hooke — then-Curator of Experiments — demanding that he be considered for membership. Receiving no reply, he sends Hooke a package containing the sole copy of all his writings. When Hooke sees that much of Newton's research treads the same ground as his own, he decides to visit Newton and take him down a peg or three. The

fictional encounter shakes up the course of both men's lives, as well as that of Catherine Storer, an apothecary's daughter who may have been a youthful romantic interest of Newton's.

Isaac's Eye
ENSEMBLE STUDIO
THEATRE, NEW YORK
CITY
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The tension between the childish Newton, with his unpleasant moralistic streak allied to a tendency to fight dirty, and the callous, hedonistic Hooke, fuels the gripping narrative. Catherine, a realist, grounds the saga by trying to tempt both men to give up research for a mundane life. But perhaps the real story here is in how truth is told and perceived. Historians have criticized Newton for embellishing facts: his theory of gravity, for example, might not have been inspired by a falling apple. This tendency towards myth-making emerges early in the play, when Hooke accuses Newton of writing up experiments as though they were conducted in a single afternoon. Newton can't grasp the criticism. "It's clearer that way," he responds.

Sensing Hooke's reluctance to support him, Newton tells a lie. He claims that he has stabbed a bodkin under his eye to prove his own theory about the nature of light — and disprove Hooke's. Hooke calls his bluff, but when the scientists perform the experiment for real — first on a semi-willing subject, then on Newton — the truth is no clearer. The wincing in the audience during these highly realistic scenes was almost palpable, however.

"In some ways, this play is about how many liberties you decide to take when trying to convey something that's true," says Hnath. To help viewers sort fact from fiction, Hnath employed the conceit of a nameless narrator who uses cardboard signs and a chalkboard to wrangle known facts about the two scientists' lives into a list of bullet points. It's the seventeenth-century version of PowerPoint. But in the end, tweaking reality — as Hnath so skillfully does — might provide the clearer picture of the human truths in this scientific tug-of-war. ■

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