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## Pushing for power

Tales of brilliant scientists and their heroic discoveries can overshadow the true nature of scientific communities, which are often dominated by battles for power and success.

### Ad Lagendijk

Every branch of science cherishes its heroes. And admiration for them extends well beyond each discipline; laymen share the fascination when they learn about the lives of these champions of science and their brilliant discoveries.

Knowledge about these icons typically comes in the form of short, idealized biographical sketches which are supposed to reveal the context of scientific discoveries. They can be found in textbooks, newspaper articles, science magazines and scientific presentations. But the historical overviews of physicists and the physics community, seen through rose-tinted spectacles, strongly contrast with my daily experience as a professional physicist.

When I participate in a scientific conference I see a gathering of aggressive men (and yes, I mean men) fighting for their scientific claims to, at best, minuscule advancements. Territorial behaviour emerges all over the place, and yes, I too am guilty of it.

Successful scientists incessantly travel around the world performing their routines like circus clowns — forcefully backing up assertions over what are their contributions to the latest scientific priorities. Recently, there has been a call for physicists to focus more on biology. But surely there is no further need for this; physics 'red in tooth and claw' is already dominated by biology, of the kind studied by Charles Darwin.

A modest Japanese presenter does not stand a chance against a loud, American critic speaking in his, and modern science's, mother tongue. An offensive question asked at a conference by a streetwise, senior physicist of an overenthusiastic, junior Spanish scientist can be counted on to have the

desired effect: a high-tempered, ultra-fast, absolutely unintelligible reply. "Target neutralized" as they say in the military.

It is not just at conferences that predatory scientists participate in the power game. Other forums include harsh reports written by anonymous referees reviewing papers for high-impact journals; damning assessments of a lecturer's teaching skills; or dismissive reviews of applications to granting organizations.

Powerful programme-committee members regularly appoint themselves as invited speakers. Even in what has been traditionally small-scale science, we physicists cultivate the mushroom approach: there is a rampant rise in the number of scientists running larger and larger groups, collecting authorships, citations and invitations to talk at international conferences.

A new quantifier of scientific power — number of patents — is already creating a furore. Patents will soon be added as trophies to the collections of these 'operators'.

In the battle for tax-payers' money, criticizing other branches of natural science, or indeed neighbouring disciplines in physics, is already a popular activity. "My discipline is more fundamental than yours," is a frequently heard claim. Note that it is not size that matters, but fundamentality. This silly, 'fundamentalist' game — reminiscent of high-priests fighting over the exegesis of their holy scriptures — is a favourite pastime for high-energy theoretical physicists. But all physicists enjoy this sport when commenting on chemistry or biology.

Young, self-assured, male PhD students quickly learn the rules of the game. When confronted with a new research assignment, their response is not fascination or curiosity; rather their first question is

whether they will be first author on resulting publications.

I am sure that my observations extend to other branches of science as well. Surely their practitioners similarly try to uphold idealized fairy tales about their discipline and its heroes for the public.

The primitive value system — tallies of publications, citations and patents — now used in science is the cause of this obsession with power rather than with curiosity and scientific progress. But does this system give us, in the long term, the best value for money? I doubt it.

A cynic will be ready with a response to my criticism: "Existing in the physics community is part of life and life is tough. Expecting higher moral behaviour of scientists is naive. Just read Thomas Kuhn."

But I have a different opinion. Science has always been a man's world. The values and norms that control our disciplines were established by men. In physics there is an alarming lack of female participants; it would be tempting to claim that because of physicists' typically masculine power games the physics community is not an attractive option for female scientists.

I won't make this claim, as the widely recognized, severe under-representation of women in physics has been analysed thoroughly, and from many angles, and nobody has found an easy solution. But I will say that to bolster true scientific progress, we should change our norms and values in physics. We should become emancipated. ■

Ad Lagendijk is group leader at the FOM-Institute for Atomic and Molecular Physics, Amsterdam, university professor at the University of Amsterdam, and professor of physics at the University of Twente, all in the Netherlands.