editorial

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Managing freedom: Managing researchers as if they were warriors☆

We already know where to go. We know how to do our job. We need to be assisted, not led.

Brian Marick, software consultant

The productivity decline of the pharmaceutical industry is an important issue, not only for the industry, but also for society as a whole [1,2]. Although its causes remain obscure so far, a remedy will probably need to address all aspects of drug discovery. One still under-discussed topic is the optimal way of managing research. It might be under-discussed because the cultures of research and management do not mix very well. Scientists have written vigorously against modern management [2–5]. On the other hand, management theory, coming from an industrial background, struggles with the difference between research and regular production activities. Nevertheless, interesting analyses have been published on managing creativity that are immediately applicable to big Pharma research [6–8] and in which many scientists would feel themselves wholeheartedly understood. For 12 years, I have experienced this divide, as a scientific researcher and a husband to a senior management consultant. In order to bring management and research cultures together, I would like to review here the main ideas in innovation management literature and illustrate them using the popular metaphor of researchers as warriors.

What does modern management theory say about research? One core theme is that creative people need a degree of independence. This is something that most researchers would agree with. For this, management theory proposes non-hierarchical forms of leadership for use in research, such as coaching style and 'covert' leadership [9]. To paraphrase a recent book: 'managing researchers is about not managing them' [10]. At the same time, the theories point out at that researchers are dependent on the organization to provide resources and context for their research [8]. Moreover, scientists also crave for good supervision [11]. So, the real challenge in managing research is to provide independence in the proper context, to give freedom, but also to help people deal with it. This requires a good understanding of researchers and what motivates them.

The call of management theory for the independence of researchers is based on two arguments. The first is that, as specialists, they are, by definition, hard to challenge technically [6]. A more important second point is that it is the nature of research to be 'in search' of something. The best approach, as in any hunt, is to split up into small groups, to create diversity [8]. So the most efficient research organization is divided into small hierarchical groups or teams. This is traditional in academia. Because nobody knows the path to discovery, nobody can tell these research groups which path to follow. It is their job to find out. This is illustrated by river beds in Figure 1. The research groups thus enjoy much operational independence, but little hierarchical power. They

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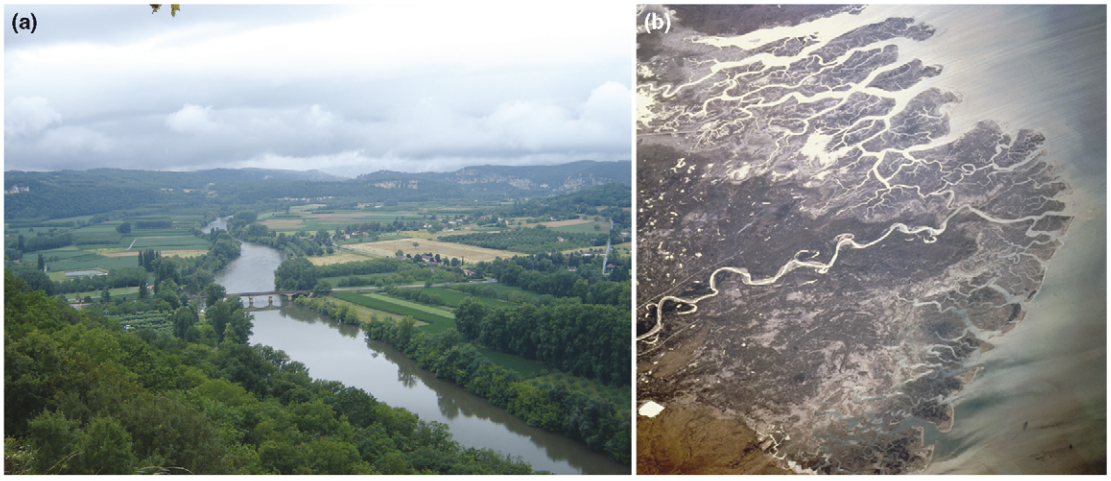

FIGURE 1

Two river beds that symbolize two organizational extremes. **(a)** (left panel) In a production organization the way forwards is obvious, as illustrated by all the water in the river following the same bedding (author picture of the Dordogne river). **(b)** (right panel) in a research organization the way forwards is obscure, as illustrated by the river water taking many directions in search for the sea (picture of the Indus river delta, source Wikipedia). Further finesse can be found in the tributaries having different sizes. The large tributaries take the most likely paths towards the sea, and the smaller ones take the more unlikely paths. Thus, in an efficient research organization, larger teams would follow more likely leads and smaller teams make more adventurous plans. Note that in both cases, and despite the apparent disorganization of panel (b), the water reaches the sea with the highest efficiency and speed allowed by the geography of the landscape.

can be viewed as 'leaders of themselves'. This structure for efficient discovery is quite different to the large, hierarchically led structure that is needed for efficient production [9]. Therefore, a research organization also has a different management challenge, which is supporting and directing a collective of 'leaders of themselves'.

This challenge of having autonomous specialists give their best together is an age-old problem. The same problem arises in other professions, such as software development [8]. Moreover, the same problem also existed in the old days when our ancestors were still warriors. Just as researchers, warriors were specialists (with weapons). The independent spirit of warriors is legendary ('I am my own man'). Thus, they are also 'leaders of themselves'. A few of us will be familiar with warrior stories such as the 'Seven Samurai' [12], about how seven individualistic specialists are convinced by villagers to team up and help them. Similarly, the stories of King Arthur portray him managing the wayward Knights of the Round Table in search of the Holy Grail. Research management can learn a great deal from these stories. In fact, the parallel between researchers and warriors is often used rhetorically [13], most famously in Nixon's 1971 call for a 'War on Cancer'. Googling 'fighting malaria' or 'combating AIDS' also results in millions of hits.

Categorising warriors and scientists as 'leaders of themselves', indicates that both these professionals require leadership qualities, only not in a hierarchical context. In a popular interpretation of leadership theories [14], every good leader is attributed the four characteristics of a *vision* of the way forward, the *discipline* to achieve it, the *passion* to invest the energy, and the *spirit* (or the conscience) to choose a direction that is meaningful for employees and society.

Because warriors are a particular subset of leaders, we can expect their historic values to parallel the leadership values. In this, we are helped by the fact that all warrior (hero) stories share a common outline [15]. At the start, the warrior is asked for help, by a lady, or by his king, to do something for a greater goal. It is important that the warrior does not fight for selfish reasons, because that would make him a mercenary [16]. Then, the warrior goes on a mission (or quest). During this quest, he gets challenged and he needs his skill to find a way through. Then, he gets challenged and challenged again, until almost at breaking point, but he is brave and never gives up. Eventually successful, the warrior returns to society as a hero, and is received enthusiastically by his peers, king or lady [15]. In this, they give him honour and glory, which are his real reward. To summarize, we might say that, in analogy to the leadership values, a good warrior has a *quest* to pursue, has the necessary *skill* to confront challenges, has the *braveness* to persevere when things look bad, and places *glory* higher than materialistic rewards (see Table 1 in supplementary info).

Now we return to the scientist. Research is seen by the public as a means of improving society. This gives scientists status in society, and motivates them to pursue a career in research [11]. To realize a meaningful contribution, scientists first undergo the largest amount of schooling that society has to offer, after which they have the high-level skills needed for their task. After a ceremony that resembles an initiation rite, they get to wear the title of Ph.D. If all goes well, researchers then pick a project to work on. It is common not to pick the easiest project, but the most high-impact, high-profile. The next step is to persevere. In academia, this displays as an incredible fanaticism to get a good publication. In Pharma, this displays as an incredible resilience in restarting again and again after candidate drugs fail. In the end, the reward comes in the form of authorship, citations, media exposure, prizes, or simply the satisfaction of having contributed. Thus, a good researcher has a *project* to focus on, has *trained* to cutting-edge to do the job, is inspired by *challenges*, and does all the work for recognition or a sense of *contribution*. These are essentially the same values as the warrior.

What do these four values mean in practice? Modern research management theories find, sometimes to their own amazement, that researchers have a high degree of self-motivation [6,8]. Therefore, they do not need to be stimulated by classical management mechanisms, but are best given room to act. It is said that the principle task of management should be to facilitate resources, handle conflicts and shield researchers from organizational noise [6,8,10]. In the extreme, this leads to the movement of servant-leadership [17]. Indeed, if scientists are asked to describe their ideal supervisor, they describe a picture of a comfortable home [11]. Others have compared the role of research management that of a benevolent guardian [8]. In the warrior analogy used here, management would resemble a royal court, which itself is never involved in any dangerous undertaking, but where knights come and go, where they can give news of their proceedings, but also rest and have their wounds taken care of. Although management is separate from research, management steers researchers by appealing to what researchers need, and what they find important. They influence them continuously by appealing to the four basic values. These values are defined and described in the accompanying supplementary information. They define and clarify quests, they facilitate and demand high-level training, they stimulate bravery, they reward with glory.

In summary, production organizations are geared towards the efficient execution of a known protocol. These are generally large hierarchical organizations aiming at reproducible, thus more average, output. In contrast, research organizations need to deliver high value output, even if this means that output is irregular. They need to discover novel protocols and therefore to give their researchers maximum freedom to operate. This results in a flat organization, a collective of research groups in which management functions as a sort of home base. Interestingly, this is also the way in which the creative effort of Hollywood film production is organized [5], as well as some software companies, and traditional academia.

Autonomy also brings in responsibilities, requiring that researchers become 'leaders of themselves'. In analogy to warriors, a good performance requires a sense of quest, high skill, lots of braveness and a desire for glory. These values parallel the dominant ideas in research management literature, and the practice in the 500-year-old culture of academia. An organization with strong warriorship creates a maximum diversity of approaches, and optimal use of talents and skill. No other organization has a better chance of creating that unique situation in which people, priorities, skills and ideas are really in-line. For pharma: where good biology, chemistry and pharmacology multiply into the discovery of new drugs.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.drudis.2008.04.012.

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