BOOKS & ARTS

Industrial relations

What lessons can be learned from a landmark deal between a company and a university department?

Universities in the Age of Corporate Science: The UC Berkeley–Novartis Controversy
by Alan P. Rudy, Dawn Coppin, Jason Konefal, Bradley T. Shaw, Toby Ten Eyck, Craig Harris & Lawrence Busch
Temple University Press: 2007. 256 pp. $54.50

Scott Wallsten

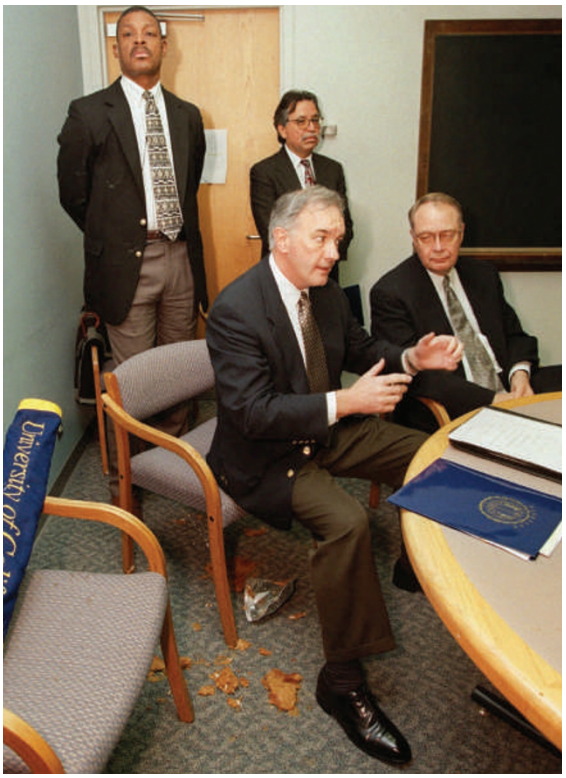
Universities can be ambivalent about their relationships with industry. Ideally, researchers can carry out fundamental scientific research without having to worry about commercial applications. Industry, on the other hand, is less likely to undertake research into basic science because of the limited return, and so is more likely to focus on research that yields commercial products. In principle, then, university and industry research are complementary.

But the reality is not always this simple. Industry scientists sometimes pursue fundamental science, and university scientists sometimes work on projects that will potentially yield commercial payoffs. Moreover, there is not always a clear line between applied and fundamental research. Industry and university research can overlap substantially, with collaborations producing benefits to society as well as supporting financially constrained academics.

The challenge is how to foster relationships between industry and academic scientists in ways that enable university researchers to keep their academic independence while allowing companies to generate returns for their shareholders. Balancing these objectives is not easy.

Industrial support of university research is nothing new, and in recent years both governments and universities have tried to find ways of bringing university research to the market. Nevertheless, the agreement between the University of California, Berkeley, and the pharmaceutical giant Novartis (the UCB–N agreement) in 1998 was unusual in both its size and its scope, and was highly controversial (see *Nature* **399,** 5; 1999). As a way of resolving the controversy, the university agreed to commission a study of the UCB–N agreement and its impact. *Universities in the Age of Corporate Science* is the outcome of this study.

The book provides fascinating details of the deal, the players and the controversy, and does an admirable job of empirically and qualitatively measuring the effects of the agreement on scientific research. It succeeds in its aim of analysing the UCB–N deal despite being written in a way likely to appeal more to sociologists than to people interested specifically in the issue, especially in the early part of the book — the reader is not properly introduced to the UCB–N agreement until the fourth chapter.



G. NIKITIN/AP

Crushed underfoot? Many researchers were unhappy at a deal between the University of California, Berkeley, and Novartis.

Alan Rudy and co-authors attempt to put a theoretical structure on the analysis — a laudable intention as testable theories help to frame analyses and clarify the precise questions being asked. In this case, though, theory does little to structure the analysis. The reader's reward for ploughing on is an in-depth discussion of the UCB–N deal and the firestorm it ignited.

The authors explain the many factors that came together to intensify the controversy. First, the deal was unique in that the company made the agreement with an entire university department, rather than with just a single researcher. As a result, and unlike the usual grant funding system, the agreement subjected an entire population of researchers to its stipulations. It also seems to have exacerbated some resentment between departments over resources. Second, many perceived that the deal was not sufficiently transparent and that it was made with scant input from groups that could have been affected, such as graduate students and postdocs. Third, Novartis was given unprecedented access to the department's research, including the right of first refusal to licensed discoveries — regardless of whether or not they were funded by Novartis.

Ultimately, though, none of the opponents' fears about industry affecting university research were realized. The authors conclude: "it appears that UCB–N resulted in modest benefits and very little harm" to the department.

The authors labour to draw general lessons from the UCB-N experience, although it is not obvious that there are many to be drawn. Generalizing lessons from a case study is often problematic, particularly if there are factors specific to the case. For example, as the authors note, Novartis was undergoing radical corporate restructuring throughout much of the agreement, so the extent of its involvement may have been affected, even though its funding commitments were met.

Case studies are typically chosen precisely because there is something unusual about them. The furore surrounding the UCB–N deal also makes it hard to generalize. Potential abuse, for example, may have been kept in check while people were keeping a close watch on the collaboration, and interactions between scientists from both sides may have been affected for fear of fanning the flames. In other words, both the benefits and the costs of the agreement may have been muted by factors unique to the UCB–N agreement.

Complaints would not necessarily have been resolved more satisfactorily if the university had handled them differently. Graduate students and postdocs felt left out of the process, but what should their level of involvement have been? The interests of both groups are short term compared with those of the faculty. The outcome may have been adversely affected if

too many parties were involved, as negotiations could have become unwieldy and agreement less likely.

Collaborations between university and industry can bring large benefits: more resources to university faculty and students, faster dissemination of research results, new products on the market, and fresh insight from interactions that might not otherwise have happened. But such collaborations can be difficult to manage because universities and industries have different objectives.

In short, *Universities in the Age of Corporate Science* is a compelling and detailed description of the events surrounding the UCB–N deal. It should be enjoyed by all those who follow the evolution of university–industry relations, offering as it does a unique look at how the collaboration was made. ■

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Builders with little brains

Animal Architects: Building and the Evolution of Intelligence
by James L. Gould & Carol Grant Gould
Basic Books: 2007. 316 pp. $26.95

Tore Slagsvold

Running, climbing, diving and surviving in extreme environments are just some of the physical skills in which animals excel compared with humans. But we are confident that our bigger brains make us better at tasks demanding intelligence. Take building, for example — we can build cars, houses and castles. But to what extent is intelligence actually needed to be a good architect and builder, and are humans really unique in this respect?

These questions are raised by James Gould, professor of ecology and evolutionary biology at Princeton University, and science writer Carol Gould in their book *Animal Architects*. They point out that tiny termites can build a tower 6 metres high. Taking relative body length into account, this would be equivalent to about a height of about 4 kilometres for a human, making the Eiffel Tower and the Empire State Building seem very small indeed. Even in absolute size, coral reefs — the largest structures built by animals and the only signs of life on our planet that are visible from space — are beyond the scope of human creations.

In this book, the authors show how spiders build webs with silk to catch their prey; how a silkworm weaves its cocoon around itself; how honeybees use wax to build precise hexagonal combs for their young and for honey; how paper wasps masticate materials from twigs with water to make damp cellulose for their combs; and how insects get air-conditioning for their homes. Birds are also sophisticated builders of nests. But building skills are generally less developed in mammals, as the safety of the womb renders additional prenatal protection redundant — although there are some notable exceptions, such as the beaver.

Does building call for great cognitive ability? Not necessarily, say the authors, who use knowledge from ethology about sign stimuli, motor programmes and motivation to explain how impressive constructions can be built from many small steps. This explanation seems plausible — after all, I can cook a complex meal by following a detailed recipe, and I may even be able to build a small cabin.

The question of intelligence is integrated into the whole of the book, which is a notable achievement. The authors even offer a provocative analysis of one of our own skills that we consider to be very advanced — language learning — and show that it is based on a simple chain of built-in recognition systems for sign stimuli and on innate motor programmes. Such innate behaviours do not preclude the existence of higher cognitive processes, however: indeed, these allow us to perform largely on 'autopilot' while focusing on whatever cognitively challenging task arises.

We also believe we have a unique aesthetic sense, yet some animals, such as bower birds, build small huts decorated with colourful objects. The bower's only purpose is to help attract a mate. Bower birds are considered to be intelligent, suggesting that recursive cycles of selection for a single set of cognitive building abilities and aesthetic refinements are part of the same sort of positive-feedback loop that may have led to the evolution of the human mind. Well, parrots and crows are smart too, but most parrots do not build nests, and crows make only simple nests from sticks (albeit with a lining). The evolution of bigger brains may have more to do with sociality and the necessary communication skills. Humans have no impressive evolutionary past as builders and originally lived in simple caves. But we used tools for hunting and fighting, and the authors may be correct in saying that such skills contributed to brain evolution.

The illustrations in this highly readable book are in black and white, which does not do full justice to the animal architects' remarkable achievements. Each of the ten chapters has a separate list of literature for further reading, but as references are not included in the text it is hard to figure out what is new and which contributions are the authors' own.

Animal constructions are fascinating, and the authors provide some useful insights into them. They show how the creation of complex constructions depends on evolutionary history and the investment of time and energy. Although the builders may not be particularly intelligent, their buildings serve their purpose well and confer fitness benefits on the architects. Could it be that our own building activity is driven not only by the need to shelter from the storm, but also by the desire for power and mate attraction? ■

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M. & P. FOGDEN/FLPA

Attractive design: male bower birds build nests adorned with colourful items in a bid to lure a mate.