OFF THE BEAT

Winning and losing: The medical awards game

I found myself outraged last November when America's most prestigious medical awards — the Lasker awards — were handed out in the brain peptide-opiate field to only three of the four scientists whom I had expected to receive them. The three who were acclaimed were men; the one who was excluded was a woman. I was all the more incensed because the Lasker awards are not limited to three scientists as the Nobel Prize in Medicine is. Because many Lasker awardees go on to win a Nobel Prize in Medicine (SN: 12/2/72, p. 365), I felt that three male scientists in the brain peptide-opiate field had been set up, via the Lasker awards, for a Nobel, whereas a fourth deserving investigator in the field — a woman — had been excluded from the running.

"Aha!" you may interject. "A feminist's typical kneejerk reaction!" Well, there is more to it than that. I've followed the brain peptide-opiate field closely during the past seven years and have written extensively about it (SN: 11/25/78, p. 374). I'm up on the major researchers, the sequence of accomplishments and how they mesh. In brief, the presence of opiate receptors in the brain was demonstrated by Candace Pert, a graduate student at Johns Hopkins Medical Institutions, and by her senior mentor Solomon Snyder. Because Pert had been listed as the first author on their landmark papers in 1973, I concluded that she had made the major contributions to the study. On the other side of the Atlantic, a young Scottish scientist named John Hughes and his senior mentor Hans Kosterlitz discovered the brain's own natural pain-relieving molecules, the enkephalins. Because Hughes was first author on their papers on the subject in 1975, I concluded that Hughes had done most of the groundbreaking work they described.

Consequently, I anticipated that when the Lasker jury awarded work in the brain peptide-opiate field, the prizes for the discovery of the opiate receptors and enkephalins might well go to Pert, Snyder, Hughes and Kosterlitz. Indeed, I had made a good guess, but was right on only three of the four names.

In the words of the Lasker jury, Kosterlitz was cited for "his early and pioneering contributions," which "triggered the search for the enkephalins, and then made possible efficient monitoring of progress in their isolation and purification." Hughes was recognized for "his discovery and isolation of two polypeptides, now termed enkephalins." When it came to the opiate receptors, though, only Snyder was selected: "Dr. Snyder not only identified this receptor system, but with his coworkers, went on to develop precise techniques for localizing these opiate receptors, and then mapped their regional distribution in the brain."

It was these specific commendations that particularly disturbed me. I could understand Kosterlitz and Snyder alone sharing awards, since they were the senior scientists who had laid the groundwork for each major discovery. But I couldn't see any logic to junior scientist Hughes being singled out for his specific contribution, and junior scientist Pert being overlooked. Why couldn't the Lasker jury have seen fit to include all four scientists? Why credit only "Snyder and co-workers"? I was determined to find out, not only because I suspected sexism was involved, but to give SCIENCE NEWS readers some insights into the politics of medical awards.

After investigating the situation I have the growing feeling that sexism was a major reason, if not the sole reason, why Pert was excluded, and that her exclusion was more a sin of omission than of commission. But then, doesn't sexism usually work that way?

My first investigative phone call went to one of the two women members of the 26-member jury. I asked Dorothy T. Krieger, professor of medicine at Mount Sinai Hospital in New York City, whether Pert had been left out of the award because she was a woman or because she was a graduate student. "That has absolutely nothing to do with it," Krieger replied. But as to why Pert was left out, Krieger would not say: "I really don't think that should be commented on."

I then called another jury member, Richard M. Krause, director of the National Institute of Allergy and Infectious Diseases in Bethesda, Md. He explained: "The deliberations go on, the nominations get made by outside people, and these matters get discussed, and various people get put in their order. And that is the way the selection takes place. I think to say anything additional on my part would probably be out of order, and I suggest you contact the Lasker foundation." I then phoned still a third jury member, Donald B. Tower, director of the National Institute of Neurological and Communicative Disorders in Bethesda, Md., and asked why Pert had not been cited. He said it would be inappropriate to comment and referred me to the Lasker foundation.

Next I spoke to Ruth Maier, who has handled public relations for the foundation for a number of years, and asked why Pert hadn't been included in the citations. Maier thought it might be because Pert had not even been nominated for consideration. She was certain that no one had nominated Pert by letter ahead of time, and she had not heard anyone nominate Pert verbally the day the jury met and decided the awards. However, there was a possibility, Maier said, that Pert's name had come up when she (Maier) was out of the room.

So if Pert didn't even make it to first base in the awards consideration, at least not through a formal, written nomination, the logical question is: Why not? Did someone nominate Snyder by writing but not include Pert? This was the case; Snyder's written nomination came from Tom August, chairman of the department of pharmacology at Johns Hopkins Medical Institutions. I asked August why he didn't include Pert in his nomination. "I'm new here at Johns Hopkins," he replied. "I became chairman of this department two years ago. Of course I became aware of Dr. Snyder and his work. The general impression one has of Dr. Snyder's work is that it is outstanding. He has received a large number of awards. He is held in *very* high esteem by members of this department. In looking back on this, I can simply say that it never entered my perception of the staff in this department to include Dr. Pert in that nomination. There was just no reason I knew of to do that."

Who besides August and the Lasker jury might have been responsible for Pert being left out of the Lasker awards? There is some cause to believe that Snyder knew August had nominated him and may even have helped August prepare the nomination. If so, why didn't Snyder see that his colleague Pert was included? I tried to reach Snyder for his comments, but he did not return my call. Snyder did, however, tell a reporter for SCIENCE (see the Jan. 26 issue) that he thinks "it would have been appropriate if Pert had shared the award with him," but that he understands how the jury might have come to their decision.

Pert is not the only researcher who might have reason to feel left out. Other investigators who could have been recognized, some scientists feel, are Avram Goldstein of the Stanford University Addiction Research Foundation, whose research laid the groundwork for Pert and Snyder's discoveries, and Eric Simon of New York University Medical Center and Lars Terenius of Sweden, who reported discovery of opiate receptors within a five-month period of the Pert and Snyder report. In fact, if one goes by date of submission of scientific papers, Terenius was the first to report opiate receptors, and if one goes by dates of verbal reports of the discovery, Simon was the first.

Not everyone involved in the research can expect to win a Lasker, but Pert's situation does seem exceptional.

Nonetheless, given the particular trio of scientists who were recognized, Pert's exclusion does seem exceptional. Jacob Hiller, second author on the Eric Simon paper that reported discovery of opiate receptors, contends that Pert legitimately

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. . . Spiders

web: Individual females build solitary trapping webs which they renew regularly, but they care for their young and mate on an adjoining permanent, community-built web. Such spiders live a double life, Witt and Burgess have found: Like the solitary spider, the female is completely intolerant of any intruders on its trap, but on the community web that may serve 1,000 individuals, male, female, adults and young mix with few territorial restraints.

Witt and Burgess maintain it is the web type that cues *M. spinipes*'s behavior. On the irregularly shaped, sheet-like community web, the female "knows" to mind its manners, and males and spiderlings do not venture onto the trapping web lest they become dinner. "It is a problem for spiders," says Witt. "Other spiders taste just as good as anything else. So nature must have built in a way for it to tell how to behave. It appears it is the web type." Perhaps, Witt and Burgess suggest, the ability to construct both kinds of webs is inherited. *M. spinipes* appears to express both talents, but the adult solitary spider may have lost, through evolution, access to communal web-building behavior.

Another social spider — *Oecobius civitas* — may represent an intermediate between the composite-web builder and the solitary spider. *O. civitas*, Burgess found, aggregates with other spiders but combines an unusual mixture of tolerance and avoidance. On the underside of a rock, where the spiders live together, each individual builds an open-ended tube that is its hiding place and an alarm net to alert it to approaching prey. When the alarm is tripped, *O. civitas* rushes out, lassoes its victim and, circling it, wraps it in silk. Only the hunter eats the prey; nearby spiders do not partake. Though neighbors do not attack one another, the mingling spirit found in *M. spinipes* is not apparent. If an *O. civitas* is startled out of its hiding place, it may take refuge in a neighbor's retreat. The neighbor neither attacks nor stays to entertain, but gives up its home and darts into another spider's retreat.

The ultimate social spider, however, shares home, food and egg laying. Only five totally communal species have been identified so far; Witt says they may be the most recent development in spiders' 3.5-million-year-old evolutionary tree. All five species have been found in tropical climates such as Mexico, Africa, India and Australia, occupying, according to Witt, habitats that are usually unfavorable to solitary dwellers.

The Mexican species *Mallos gregalis*, first described in 1908 and rediscovered by Burgess in 1975, builds huge, multi-layered webs spanning several branches of a tree. Burgess once encountered a *M. gregalis* web that covered the limbs and branches of the upper three-quarters of a 60-foot mimosa tree. The web, a permanent, ever-expanding structure that may serve several hundred thousand of the 5-millimeter-long creatures, is mutually constructed; the work begun by one spider may be finished by another. The finished product has individual retreats, special chambers where females live with communally laid egg sacs and a surface sheet pocked with tunnels connecting to the interior. Hapless insects that become entangled are pounced on by several spiders, male and female, immature as well as adult. Even if the spiders have been starved, according to Burgess's work, they will not take away another's food. Though attacking spiders are quite aggressive, Burgess notes, they never turn on each other.

The mechanism responsible for such tolerance seems to involve the acoustical properties of the web. Using anesthetized flies, flies with immobile wings and normally mobile flies, Burgess found that *M. gregalis* only pays attention to buzzing flies, and the more the fly buzzes, the more spiders it attracts and the quicker they attack. It is the web-carried wing vibrations of the trapped, buzzing flies that attracts the spiders, but the web must also carry the vibrations of the thousands of inhabitants. What protects them? Burgess found that the web is a selective transmitter; it suppresses some signals while enhancing others. Moreover, Burgess has found that the signals it augments lie between 40 and 500 cycles per second, which just happens to include the frequency range of the buzz of a fly's wings. Conveniently, the web's properties offer protection as well. The buzzing of a mired honeybee, at more than 1,000 cycles per second, attracts no attention.

Communication by web also solves the courtship problem. To overcome the solitary spider's reluctance, elaborate courtship is necessary, but in the familiarity of the communal web, no such ritual is needed. The male "advertises" by drumming on the web in a specific way and only mature females answer the call.

To Burgess, the spider serves as a model for studying the evolution of social behavior such as communication and communal living in all animal species. His recent work on how spiders distribute themselves — *M. gregalis* forms cluster of threes while solitary spiders get as far apart as possible — implies there is an active form of communication between the animals. There is evidence, based on his studies, that chemical signals and surface textures may clue spiders that "oh god, this is my sister," as Witt says. Spiders, which seem to have adapted to a variety of lifestyles and habitats, may offer answers to the ways individuals and communities solve problems. In addition, Witt has studied their problem-solving responses in terms of changes in web-building to various drugs. He suggests they may offer an excellent laboratory model for testing behavior-altering effects of drugs. Says Witt: "It's a look at the world through spiders." □

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"has a bone to pick." On the other hand, he points out that Pert's situation with Snyder was somewhat analogous to his own situation with Simon at the time both labs discovered opiate receptors. "I was assistant research scientist," he says. "It was my hands that did it. It was both of our ideas. But he [Simon] was the senior investigator, and senior investigators are allowed certain privileges — like getting awards."

Now that Pert is an independent investigator (with the National Institute of Mental Health), is there a chance she might bypass the Lasker awards and still win a Nobel prize for her role in the discovery of opiate receptors? Maybe, but I'm not very optimistic, since the same informal roster of predominantly male scientists, sometimes referred to as the "old boys" club, seems to nominate scientists for both the Lasker awards and for the Nobel Prize in Medicine. In fact, Pert has already tasted nomination discrimination in the Nobel arena.

Not long ago, a well-known neuroscientist called Pert into his office and said, "I have to make Nobel Prize nominations." Pert lit up, thinking he was going to ask her to help prepare her own nomination for a Nobel. Then he went on to say, "I would like you to prepare nominations for Snyder, Hughes and Kosterlitz." Pert refused, on the grounds that she too should be included. "Don't you love Sol?" he asked. "What are you trying to do to him?" Pert still refused. "You have to help Sol," he insisted. "This is the way science recognition works. Then he'll help you later. How old are you, anyway? You're a nice girl. . . ."

Yes, Candace Pert is a "nice girl" of 32 years, also a wife and mother as well as a scientist. As a female sympathizer told her recently: "Let's face it, Candace. You don't look or act like a Nobel laureate. Nobel laureates aren't supposed to have three-year-old children."

—Joan Arehart-Treichel