

Why are so many bumblebees male?

Bumblebees don't seem to know that they're supposed to be mostly girls instead of guys.

Female bumblebee workers hatch from fertilized eggs, while males develop from unfertilized eggs. Geneticists calculate that female workers tending the young share, on average, 75 percent of their genes with their sisters but only 25 percent with their brothers. Evolutionary theorists have predicted that such species would not favor males. Yet, *Bombus terrestris* bees raise some 13 sons for every daughter.

Researchers at the University of Amsterdam now report measurements from laboratory bee colonies that may help explain the mystery. Females need three times the food that males do, report Madeleine Beekman and Pam van Stratum. In tough times—most of the time in the real world—colonies do better investing more in the “cheaper” sex.

The researchers also expand on previous calculations indicating that a key factor in male predominance is the bumblebee male's tendency to mature before the female. The males may emerge first for the species on the whole, but the Dutch researchers found that females matured before males in 18 of the 41 well-fed laboratory colonies. Overall, the researchers argue in the August 22 PROCEEDINGS OF THE ROYAL SOCIETY OF LONDON B, a mix of colony types constitutes a stable world where most bumblebees are guys. —S.M.

How fish find brothers and sisters

Young Arctic char, which respond to the scent of siblings they've never met, may accomplish the trick by tracking clues controlled by immune-system genes.

Normal char, a salmon relative, prefer a sibling's scent over a stranger's even if the youngsters have been separated since fertilization, note K. Håkan Olsén of Uppsala University in Sweden and his colleagues. To recognize kin, the fish do need some early exposure to their own species, though not to their own family. Char reared in complete isolation don't seem able to pick out siblings.

To begin unraveling how fish recognize kin, Olsén's group set up an artificial stream offering fish a choice of water sources. The researchers checked a segment of the fishes' DNA in one of the major histocompatibility complex (MHC) genes, whose human versions are key to the immune system. These genes have been implicated in kin recognition among a variety of animals.

The fish preferred water scented by a sibling with an identical DNA segment rather than water from a sibling with a different segment. Moreover, the nonmatching sibling won out over an unrelated fish, which also had a nonmatching DNA segment. In the August ANIMAL BEHAVIOUR, the researchers argue that MHC “has a significant influence” on cues for recognizing fishy kin. —S.M.

For longer life, give her a choice

Give female fruit flies their pick of mates generation after generation, and their descendants will start living longer.

That finding supports the good-genes theory, which predicts that ladies somehow choose the gentlemen with the better heredity, says Daniel E.L. Promislow of the University of Georgia in Athens. It also shows that sexual selection can benefit animals instead of just fostering extravagant courtship.

Eighteen years ago, Linda Partridge of University College London developed this approach and reported that fruit fly larvae have a competitive edge when their mothers choose among males. Promislow expanded and fine-tuned the test. He found that after some 10 generations, mortality rates were 10 percent lower in mate-choosing lineages compared with lineages whose females were stuck in vials with only one possible mate. Promislow's results appear in the Sept. 1 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES. —S.M.

Social disconnections on-line

It's a modern problem, with a touch of high-tech irony. People use their home computers primarily for social reasons, such as trading E-mail messages with a child at an out-of-town college or exchanging advice about hobbies in an on-line chat group. Yet, as folks communicate more through these electronic channels, they talk less with family members, meet with fewer friends, and feel a bit more down and lonely.

That, at least, is the implication of a study directed by psychologist Robert Kraut of Carnegie Mellon University in Pittsburgh. The preliminary findings raise the possibility that new entrants to cyberspace pay, in addition to the monthly service charge, a social and emotional price for their on-line hours.

Kraut and his coworkers examined the social involvement and psychological well-being of 169 people from 73 Pittsburgh households before and after their first 1 to 2 years of Internet use. Participating families received a computer and software, an extra telephone line, E-mail accounts, and access to the Internet, all free of charge. In exchange, they allowed the researchers to monitor each family member's Internet use. The volunteers completed periodic questionnaires and participated in interviews in their homes at the end of the study.

Volunteers who frequently used the Internet and E-mail reported small but statistically significant drops in time spent talking with family members and in the size of their local circle of friends. They also noted increased loneliness and signs of mild depression, such as feeling unable to “shake off the blues.” The isolation and unhappiness intensified as computer use expanded, regardless of race, age, sex, household income, and initial levels of social interaction and depression, the researchers contend.

Teenagers heavily using the Internet and E-mail reported more isolation and loneliness than the adults, Kraut and his colleagues report in the September AMERICAN PSYCHOLOGIST. Turmoil in adolescence may cause some teenagers to withdraw from social contacts and use the Internet as an escape, the researchers suggest.

They propose that the negative effects of Internet use may stem from participants substituting shallow interactions—which often involved communicating with strangers—for more varied and supportive real-world contacts.

It's not known if the findings would apply to other groups given free on-line access, to people paying for on-line use, to those with more years of Internet experience, or to Internet users participating in other forms of on-line communication. —B.B.

Moving clues to dyslexia

A new study adds to evidence that the reading disability known as dyslexia involves an inability of the brain to coordinate the perception of objects moving quickly, such as that of letters scanned on a printed page.

Neuroscientist Jonathan B. Demb of the University of Pennsylvania Medical School in Philadelphia and his colleagues recruited 10 adults, half previously diagnosed with dyslexia. The researchers used functional magnetic resonance imaging (fMRI) to record cerebral blood flow, an indirect sign of neural activity, as volunteers tried to pick out the faster of two moving gratings shown on a computer screen.

Compared with good readers, dyslexics were less successful and exhibited reduced activity in the primary visual cortex and related brain areas involved in motion perception (SN: 3/7/98, p. 150), the scientists report in the Sept. 1 JOURNAL OF NEUROSCIENCE. The slowest readers displayed the lowest blood flow in these regions.

It remains unclear whether the motion perception problems found in this study cause dyslexia by themselves or are part of a larger deficit in information ordering, the researchers say. —B.B.