females today,'' he says. ''But along with some of the so-called blessings come some disadvantages.''

One seeming disadvantage is the wider social acceptance of female drinking and drug use. According to the Rutgers survey—which questioned 1,970 junior and senior high school students in Middlesex County urban and suburban districts—two of every three students say they drink beer, wine, hard liquor or a combination of those. One of every three reports using marijuana, and almost all of those students who smoke, drink alcoholic beverages as well, reports the study, which was funded by the New Jersey State Department of Health and the National Institute on Drug Abuse.

In both cases, the percentages were almost identical for males and females—confirmation, according to Pandina, that young women are ''catching up'' with men. A decade ago, similar studies showed that while 65 to 85 percent of males said they drank, only 50 percent of the females classified themselves that way, Pandina says. ''We've seen the trend (of females catching up) since the late '60s,'' says the psychologist. ''Now it appears as though females are on a par.'' Pandina says the Rutgers findings are consistent with other recent results.

But along with the rise in female alcohol and drug consumption has come the evolution of a more sophisticated set of youngsters who do not appear to consume excessively. In the Rutgers survey, only one in seven of those sampled say they drink beer or smoke marijuana at least several times a week. One in 18 say they drink wine or liquor with the same frequency. When asked about the use of other substances at least several times a week, 1 in 40 replied they use amphetamines, and 1 in 100 said they use barbiturates. Six of all students use hallucinogens, four use inhalants and just two use opiates. Since some of the students are multidrug users, there is considerable overlap in the figures, the scientists report.

The researchers were somewhat surprised at the early age—12 to 13 years—that many of the youngsters began using marijuana. ''The first use of mariujana now appears to coincide with the first use of alcohol,'' Pandina notes. Not too long ago, marijuana was primarily confined to college campuses, he says. Pandina suggests that earlier use could lead to more extensive smoking as adults.

Also unexpected was the finding that 10 to 15 percent of the youngsters report some experience with cocaine. This surprised the researchers because cocaine is an expensive drug that requires a street contact, and most of the youngsters surveyed were from ''standard, blue collar communities.'' □

Genetics of generation gap in insects

Conflicts between parents and their offspring are certainly as old as the history of man and even extend back through the history of insects. Biologists have been examining this basic problem of family life among insects living in different social situations. The scientists are looking for general principles that will explain how natural selection affects the evolution of social behavior.

The area of conflict between parent and offspring of social insects involves care of siblings. Because of a peculiarity of inheritance among the group of insects that includes bees, ants and all social insects except termites, the genes of the mother will be most widely propagated if she produces approximately equal numbers of males and females. In contrast the genes of her daughters, the workers in the insect colony, are best served if the workers take better care of their sisters than of their brothers.

The reason for this asymmetry is that among Hymenoptera insects, full sisters share, on the average, three-fourths of their genes, while a sister is related to her brother by only one-fourth. (The difference arises because males develop from unfertilized eggs and have only one set of genes, while females develop from fertilized eggs and have two sets.)

Kinship theory, proposed in 1964 by W. D. Hamilton of the University of London, and recently popularized by Edward O. Wilson in *Sociobiology* (SN: 11/29/75, p. 347), is an explanation of why animals may have an evolutionary advantage if they sometimes forego acting selfishly in order to benefit the survival of others. The theory predicts that the amount of effort one organism expends aiding another will be proportional to the closeness of their genetic relationship. The Hymenoptera workers would best invest three times as much effort in raising sisters as in raising brothers.

Robert L. Trivers and Hope Hare of Harvard University reported last year that an analysis of a wide range of data collected by different researchers indicates that offspring can act counter to their parents' best interests. ''The queen's royal status flows from her unique genetic role, but this role does not give her royal powers—at least not where care for her offspring is concerned,'' they conclude in the case of single-queen ant colonies (SCIENCE 191, 249, 1976). For 21 ant species, the investigators graphed the weights and sexes of the offspring that will reproduce, as an estimate of the care (feeding) they had received. All the species invested more in females, and the ratio was near 1 to 3, as would benefit the genes of the workers.

Trivers and Hope contrasted this situation with that among slave-making ants. The slave-making workers raid nests of ants of other species to get slaves to care for the queen and her brood. These slaves have no stake in the sex ratio of the ants they rear, but the queen, as always, prefers a 1:1 ratio. The investment of care in the offspring is about equal for the two sexes in two slave-making species, Trivers and Hare reported.

Other biologists challenge the conclusion that workers interests are actually being realized contrary to the queen's interest. Richard D. Alexander of the University of Michigan and Paul W. Sherman of the University of California at Berkeley publish their argument in the April 29 SCIENCE. They object on two levels: The data given by Trivers and Hare are insufficient to establish the ratio of investment in the different ant colonies, and there is another theory better able to explain the data that Trivers and Hare report.

Alexander and Sherman believe that the simplifying assumptions the Harvard biologists made were not justified. They point out evidence for multiple matings by queens and the ability of workers to lay eggs that hatch into males. They also find fault with the researchers' selection of specimens and statistical methods.

Alexander and Sherman propose another hypothesis that they feel better fits the collected data. Rather than the workers triumphing over the queen on the matter of sibling care, the critics suggest that the observed sex ratios actually do benefit the mother's genes.

Sexual competition among genetic relatives might make parents adjust their investments in offspring of each sex. For example, if a female produced two sons that competed only with each other for every mate, they would be of no more value to her than a single son. In the extreme case, if all matings were between brothers and sisters, the most economic parent would produce only enough sons to fertilize all the daughters. This could give a male-to-female ratio as high as 1 to 46, Alexander says. Because the data for single-queen ant colonies gives a sex investment ratio of more than 1 to 3, Alexander says, sibling mating is a better explanation than offspring dominance.

Trivers disagrees. The alternative hypothesis, he told SCIENCE NEWS, requires a degree of inbreeding that is virtually unknown except in very specialized species and would be biologically absurd among ants that go to much trouble to avoid siblings mating in the nest. ''It's just exceedingly unlikely,'' he says.

Of the other criticisms, Trivers says, ''I honestly think Alexander's remarks are largely trivial and they will be shown to be trivial by more careful studies in the future.'' Although he agrees that the methodology of his study was rough in particular parts, Trivers says, ''I think it was remarkably successful and, by the standards of evolutionary biology, a very sophisticated test.'' □