

## Body and Mind

BY MELVIN KONNER, M.D.

# The Aggressors

**D**R. DAN OLWEUS KNOWS THE BULLIES in Norway; at least those 8 to 16 years old in a population of 140,000 in 715 public schools. Olweus, a professor of psychology at the University of Bergen, was asked by the Norwegian Government to get a handle on the bullying problem. Concluding his recent study, he estimates that of the 568,000 Norwegian schoolchildren, 41,000, or 7 percent, bully others regularly. The bullies were far more likely to be male: more than 60 percent of the girls and 80 percent of the boys victimized in grades 5 to 7 were bullied by males. The tendency of girls to bully declined with age; in boys, it rose: a twofold difference in the second grade widens to fivefold in the ninth.

Many studies, even of remote, primitive societies, show that males predominate overwhelmingly in physical violence. Pick your behavior: grabbing and scratching in toddlers, wrestling and chasing in nursery-school children, contact sports among teen-agers, violent crime in adulthood, tank maneuvers in real, grown-up wars. In 1986, Alice H. Eagly and Valerie J. Steffen, then of Purdue University, published a survey of 63 psychological studies. They emphasized that no category existed in which women were more aggressive than men, and they said the tendency to produce pain or physical injury was far more pronounced in men. Joining a distinguished line of social and psychological researchers, Eagly and Steffen concluded that these differences "are learned as aspects of gender roles and other social roles."

That belief, a tenacious modern myth, becomes less justified with every passing year: sex difference in the tendency to do physical harm is intrinsic, fundamental, natural — in a word, biological.

Olweus, in a smaller study — one of scores contributing to this new conclusion — selected 58 boys aged 15 through 17, and compared blood levels of testosterone, the male sex hormone, to aggression. He found a strong effect of testosterone on intolerance for frustration and response to provocation. The puzzle of aggression is not yet solved, but it seems increasingly apparent that testosterone is a key. However, it is testosterone circulating not only post-pubertally, as has been commonly thought, but also during early development — specifically, during fetal life, at the stage when the brain is forming. The first clues to this process came from animal studies. In 1973, G. Raisman and P. M. Field reported a significant sex difference in a part of the rat's brain known as the preoptic area — a region that, in females, helps control the reproductive cycle; certain brain-cell connections in this area were more numerous in females. Most interestingly, castration of males at birth, or early treatment of females with testosterone, abolished the adult brain difference.

This was the first of many similar studies showing that the differentiation not only of the brain, but of behavior — especially sexual and aggressive behavior — depends in part on early testosterone exposure. This has proved to be true of rats, mice, hamsters, rabbits and monkeys, among other species. Clear anatomical differences have been found in the hypothalamus and amygdala regions of the brain as well as the preoptic area.

One ingenious study showed that the tend-

ency to fight in adult mice, although greater by far in males, differs among females, depending on whether they spent their fetal life near males or other females in the womb. Females with males on each side in utero grew up to be fighters, but those with only one adjacent male were less pugnacious as adults. Those flanked by two other females in the womb became the least aggressive adults. Separate evidence indicated that the three groups of females also differed in their degree of exposure to intrauterine testosterone — which had evidently come from the blood of the nearby males.

No experimental evidence is available for humans, of course, but some clinical studies are suggestive. Sometimes human fetuses are exposed to hormones that have effects similar to those of testosterone — for example, synthetic progestins, used to maintain pregnancy. June M. Reinisch, now director of the Kinsey Institute, studied 25 girls and boys with a history of such exposure and found them more aggressive than their same-sex siblings, as indicated by a paper-and-pencil test. This finding was in line with studies of monkeys and other animals exposed to male sex hormones in utero. Females with such exposure engaged in more rough-and-tumble play during development than other females. As in the human study, the differences became apparent before puberty.

Some years ago, there was a bitter controversy over whether men with an extra male-determining Y chromosome — the XYY syndrome — were hypermasculine. One not-so-subtle humorist wrote in *Science* that it was silly to get so excited over the extremely rare XYY syndrome, when 49 percent of the species was already afflicted with the XY syndrome — an uncontroversial disorder known to cause hyperactivity and learning disabilities in childhood, premature mortality in adulthood and an egregious tendency to irrational

It has become increasingly obvious that male-female differences in the tendency to do physical harm are intrinsic, fundamental, in a word, biological.



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violence throughout life. "Testosterone poisoning," a colleague of mine calls it.

Is there no contribution of culture, then, to the consistent male excess in violence? Of course there is; but it acts on an organism already primed for the sex difference. Cultures can dampen it or exaggerate it. The role of modeling in encouraging aggres-

sion is well proved. Give a girl a steady diet of Wonder Woman and lady wrestlers while her brother gets Mr. Rogers, and you may well push them past each other on the continuum. But we now have a pretty good answer to Margaret Mead's famous question: What if an average boy and an average girl were raised in exactly similar environments? We don't

know, she said. Now we do. The boy would hit, kick, wrestle, scratch, grab, shove and bite more than the girl and be more likely to commit a violent crime later in life.

Mead became famous for her elegant demonstrations of cultural variation in sex roles. Among the Tchambuli, a New Guinea fishing society, the women, "brisk, una-

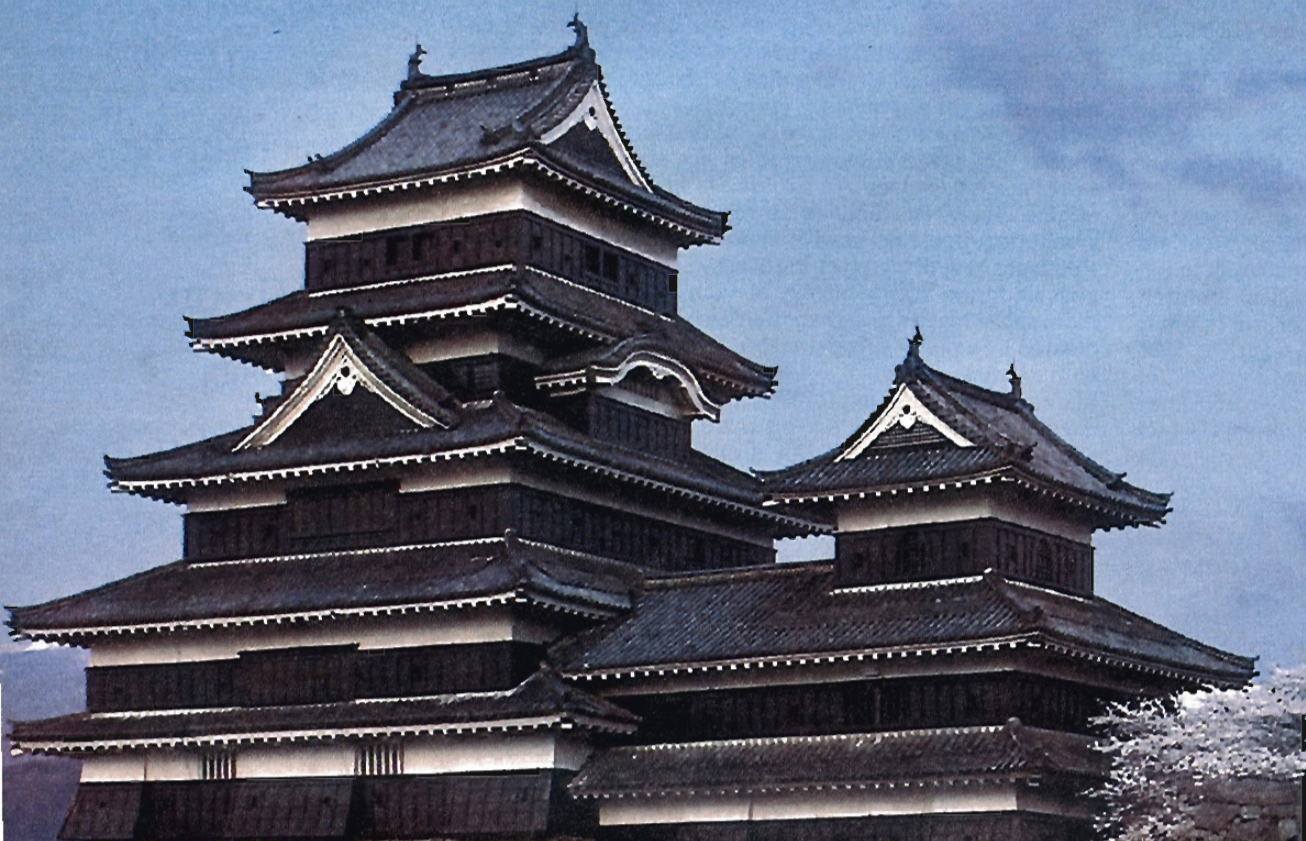
dorned, managing and industrious, fish and go to market; the men, decorative and adorned, carve and paint and practice dance steps." Among the Mundugumor, river-dwelling cannibals, also in New Guinea, "the women are as assertive and vigorous as the men; they detest bearing and rearing children, and provide most of the food. . . ." These quotations from her 1949 book "Male and Female" helped provide the basis for the modern conception of the tremendous flexibility of sex roles — as well they should have. But the Tchambuli men, when they finished their dance steps, went headhunting. And note that Mead's own words following her often-cited quote on the Mundugumor are: "leaving the men free to plot and fight." In every known society, homicidal violence, whether spontaneous and outlawed or organized and sanctioned for military purposes, is committed overwhelmingly by men.

**T**HE CONCLUSION WOULD seem to be that women should run the world. If we can agree that the greatest threat to human survival over the long haul is posed by human violence itself, then the facts of human violence — the sex difference, and its biological basis — can lead nowhere else. But what of Margaret Thatcher, Indira Gandhi, Golda Meir; what of Catherine the Great and Elizabeth I, in earlier eras? They are no use as test cases. All were women who had clambered to the tops of relentlessly male political and military hierarchies. They could scarcely restrain the surges of all those millions of gallons of testosterone continually in flux under their scepters. And again: the categories overlap; the consistent differences are in averages. The gauntlets those five women ran to get to the top and stay there can scarcely be said to have been at the least-aggressive end of the female spectrum. And women in a male world often find themselves outmarching the men — to gain credibility, to consolidate power, to survive.

Those negative examples notwithstanding, a steady, massive infusion of women into positions of power, in a balanced way, throughout the world, should in fact reduce the risk that irrational factors — "Come on, make my day" sorts of factors — will bring about an end to life on earth. Political scientists and historians often argue as if there were no resemblance between fistfights and war. Anthropologists and biologists know better.

Interestingly, that same Norway that sent Dan Olweus off to study — and try to diminish — bullying, appears to be in the vanguard. Not only the Prime Minister, but 8 of the 18 members of the Cabinet, are currently free of testosterone poisoning. In an almost-all-male, consistently violent world of national governments, this little boat of the Norwegian Cabinet may run into some high seas. But it is a far cry from the Viking ships of yore, and I, for one, am keeping a hopeful eye on its prow. ■

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