

Rachel's Environment & Health News

#477 - Sperm in the News

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This must be the year of the sperm. The NEW YORKER magazine ran a long story[1] January 15th called "Silent Sperm" --a wry reference to Rachel Carson's SILENT SPRING, which made its debut in the NEW YORKER 35 years ago. "Silent Sperm" describes the 50% loss in sperm count that has occurred in men worldwide during the past 40 years. Furthermore, the January issue of ESQUIRE features an article on sperm loss,[2] titled "Downward Motility." MOTHER JONES magazine[3] also began the new year with a sperm story, titled "Down for the Count." And the nation's newspaper of record, the NEW YORK TIMES, ran a 4-part, front-page series on increasing infertility in the U.S. January 7-10.

By far the most interesting and informative of these articles are by Lawrence Wright in the NEW YORKER and Daniel Pinchbeck in ESQUIRE. Wright and Pinchbeck interviewed dozens of prominent researchers in the field of endocrinology (hormones) and reproductive health in the U.S., Britain and Europe, and their articles offer new human perspectives on the scientific information we have been presenting since 1991 (see REHW #263, #264, #323, #343, #365, #372, #377, #432, #438, #446, #447, #448).

Here are some viewpoints that we have not previously offered our readers in our own coverage of this issue:

** Danish pediatric endocrinologist (hormone specialist) Niels E. Skakkebaek says that, in the late 1980s, "We had also been wondering why it was so difficult for sperm banks to establish a core of donors. In some areas of Denmark, they were having to recruit ten potential donors to find one with good semen quality." [1,pg.43]

** So Skakkebaek in 1990 studied sperm quality in Danish men. He started with men working in nonhazardous office jobs and laborers who did not work directly with industrial chemicals or pesticides --men thought to be healthy. For decades it had been believed that the average man produced about a hundred million sperm per milliliter of semen, and of that about 20% was expected to be immobile. Skakkebaek reported that 84% of the Danish men he studied had sperm quality below the standards set by the World Health Organization. The men themselves seemed normal in every other respect. [1,pg.43]

** On the basis of the world's medical literature, Skakkebaek calculates that in 1940 the average sperm count was 113 million per milliliter, and that 50 years later it had fallen to 66 million. [1,pg.44]

** Still more serious is a three-fold increase in men whose sperm count was below 20 million--the point at which their fertility would be jeopardized. [1,pg.44]

** In the United States, just as in Denmark, the number of donors with good-quality sperm has become distressingly low. As early as 1981, researchers at the Washington Fertility Study Center reported that sperm count of their donors, who were largely medical students, had suffered a steady decline over the previous eight years. The researchers worried that, if the decline continued at the same rate, within the decade there would be no potential donors who could meet the approved or recommended standards. [1,pg.44]

** The fact is that the number of morphologically normal sperm [meaning sperm with a normal shape] produced by the average man has dropped below the level of those of a hamster, which has testicles a fraction the size of a man's. [1,pg.44]

** In the United States, according to the National Center for Health Statistics, the percentage of infertile couples has risen from 14.4 in 1965 to 18.5 in 1995. Infertility is defined as failure to produce a child after a year of normal sex. [1,pg.44]

** There has been little published research comparing racial and ethnic sperm counts, particularly in Africa and many Third World countries. But the studies that we do have show low counts nearly

everywhere: the latest count in Nigeria is 64 million per milliliter; in Pakistan, 79.5 million; in Germany, 78 million; in Hong Kong, 62 million. [1,pgs.44-45]

** Pierre Jouannet, director of the Centre d'Etude et de Conservation des Oeufs et du Sperme in Paris, simply did not believe Skakkebaek's conclusions. Jouannet had data on 1350 Parisian men, all of whom had fathered at least one child and therefore were of proven fertility, so he analyzed them, expecting to refute Skakkebaek's studies. To his astonishment he found that sperm counts in his group had dropped steadily at 2% per year for the past 20 years; in 1973 the average count was 89 million per milliliter and in 1992 it was 60 million. [1,pg.45]

** The expected sperm count for a Parisian man born in 1945 was 102 million, whereas the count of those born in 1962 was exactly half that number. [1,pg.45]

** Jouannet has become convinced. And when he projects the decline into the future, he sees serious trouble for the human species. He says gravely, at the present rate of decline, "It will take 70 or 80 years before it [sperm count] goes to zero." [1,pg.45] [Difficulty conceiving occurs at 20 million or less; sterility occurs at five million or less.]

** Stewart Irvine, a gynecologist at the Medical Research Council's Reproductive Biology Unit in Edinburgh, Scotland, studied sperm production of Scottish males. Men born in the 1940s had an average sperm count of 128 million, whereas those born in the second half of the 1960s averaged only 75 million--a decline of over 40% in a single generation.

** Irvine told Lawrence Wright, "I had a colleague visiting from Australia, and he had with him a laptop computer with lots of data from infertile couples. He said, 'I'm sure these sperm count drops are rubbish. I'm sure there are other explanations for it.' And I said, 'Well, just take your data and plot it by year of birth and see what you get.' He got the same result." [1,pg.46]

** "Infertility is definitely going up," says Dr. Marc Goldstein, director of the Center for Male Reproductive Medicine at New York Hospital. "I see it in my practice. There is a decline in fertility in men and an increase in infertility in older couples. Studies show an increase in infertility from 11 percent to 16 percent in all married couples." He believes part of it may be life style: marijuana, cocaine, alcohol, and sexually transmitted diseases can all reduce sperm counts. [2,pg.80]

** But wildlife do not smoke marijuana or drink alcohol and there are numerous reports of reproductive problems caused by chlorinated chemicals in wildlife.

** Niels Skakkebaek, the Danish researcher, believes it is something more fundamental than life style. Whatever is happening to men, he believes, some part of it must take place during the early stages of human development--in the womb or else shortly after birth--because damage to the male urogenital system is evident in certain very young patients. [1,pg.47]

** Likewise, Richard M. Sharpe, a research physiologist with the Medical Research Council in Edinburgh, Scotland, thinks that the decline in sperm is linked to some event that affects the endocrine system, which governs the body's hormones. This must happen, he believes, either in the womb or shortly after birth. "I have absolutely no doubt this is the most important time in your life, certainly if you're a male," he says. "This is when your sperm-producing capacity as an adult is settled once and for all." [1,pg.48] Changes in life style won't help men whose sperm-producing capacity has been crippled at birth.

** In a series of experiments, Sharpe exposed pregnant rats to "minute quantities" of DES and to other synthetic estrogens [female

sex hormones]; he showed a 5 to 15% decline in sperm count in male offspring when they matured. [DES, or diethylstilbestrol, is a synthetic female sex hormone that was given medically to women in the U.S. in the 1950s and 1960s; many of their male offspring have reduced sperm counts.][1,pg.48]

** Philippe Grandjean, a professor of environmental medicine at Odense University in Denmark summarized the situation nicely in an interview with Lawrence Wright: "We thought in the past that these toxic substances would act on a target--an enzyme or DNA or the cell membrane, or something like that. But what these endocrinologists have suggested to us is that industrial chemicals can actually mimic hormones. It looks as if the receptors aren't very good at recognizing what's a hormone and what's not a hormone--perhaps because they were never previously challenged. These receptors have been kept almost unchanged in the mammalian world, because they worked. They functioned very well. But in this century we have generated all these new chemicals and injected them into the environment, and suddenly the body is exposed to new substances that in some cases can interact with that receptor. The human species is totally unprepared for this, because it has never happened before. I think the perspective is both very exciting and very, very frightening." [1,pg.51]

** Most--though not all--of the estrogen-mimicking chemicals involve chlorine.

** If, as Theo Colborn theorizes, the number of chemicals that can harm reproduction add up to hundreds, if not thousands, the only way to regulate them all will be to "reverse the onus" that now falls on individuals to prove they have been harmed by a toxic substance. "The responsibility should not be on the people exposed to chemicals to prove they have been hurt," says David LaRoche, the secretary of the International Joint Commission (IJC). "The responsibility should be on industry to prove that chemicals cause no harm." [2,pg.84]

** "I have heard that the Chlorine Chemistry Council's budget is around \$100 million," Gordon Durnil told Daniel Pinchbeck. Durnil is the former chairman of the IJC and author of THE MAKING OF A CONSERVATIVE ENVIRONMENTALIST. (See REHW #423, #424.) "It's a lot of money. You could use it to buy some research. Why don't they do some research to say what they are doing is safe?" Durnil asks. [2,pg.84]

** Unfortunately, the truth about the sperm count is that it is under attack from many different sources. Dioxin, for example, is a chlorinated chemical that does not mimic hormones. Yet it diminishes sperm count in male animals.

** Earl Gray, a senior research biologist with U.S. Environmental Protection Agency (EPA), testified before Congress in 1993 that, "Our studies [in rats] show that a single dose of dioxin administered during pregnancy permanently reduces sperm counts in the males by about 60 per cent." [1,pg.53]

** "With sperm counts, I've been more impressed by the dioxins and the PCBs than by the estrogens and anti-androgens," Gray said. "We get surprising effects at relatively low doses." [1,pg.53]

** "Probably half the jobs in the world are associated in some way with chlorine," says Gordon Durnil. "As a society, we are going to have to confront our dependence on this chemical." [2,pg.82]

--Peter Montague

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[1] Lawrence Wright, "Silent Sperm," NEW YORKER (January 15, 1996), pgs. 42-48, 50-53, 55.

[2] Daniel Pinchbeck, "Downward Motility," ESQUIRE (January 1996), pgs. 79-84.

[3] Michael Castleman, "Down for the Count," MOTHER JONES (January/February 1996), pgs. 20-21.

Descriptor terms: sperm count; endocrine disrupters; new yorker magazine; esquire magazine; mother jones magazine; fertility; infertility; organochlorine compounds; chlorine; france; denmark; scotland; us; nigeria; pakistan; germany; niels skakkebaek; hong kong; gordon durnil; ijc;