Testimony in opposition to House Bill No. 2238
Discussion and illustrations presented under K.S.A 21-6401 (g)(1)
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The definition provided of "biological sex" in this bill is scientifically incorrect in narrowly defining it as "reproductive potential or capacity...sex chromosomes, naturally occurring sex hormones, gonads and nonambiguous internal and external genitalia present at birth" and in considering gender to be a matter of choice.

In 1956, researchers discovered XX and XY chromosomes, but then variants XXY, XYY, XO, etc. also were found. Each of these variations result in differences that vary from mild to severe. In addition, we now know that two separate fertilized eggs can fuse together and develop into one individual with mixed tissues.

Table 1. Sex chromosome combinations.

		frequency
46,XY	normal male	~1/2
46,XX	normal female	~1/2
45,XO	Turner syndrome female	1/5,000
47,XXX	triple X female	unknown
47,XYY	supernumerary Y male	1/1000
47,XXY	Klinefelter syndrome male	1/500
45,X/46,XY	mosaic syndrome male	unknown

There are normal variations in testosterone and estrogens produced by "normal" XX and XY individuals. Testosterone is produced by both testes but also the adrenal glands found in both males and females. Estrogens are produced by ovaries but also by fat tissue found in both males and female. When Olympic runner Griffith Joyner practiced for the games in Seoul and elsewhere, she often lost all fat tissue which reduced estrogens to the point she no longer had a period. The level of estrogen from the ovaries is usually not alone sufficient to trigger the normal menstrual cycle (an important evolutionary mechanism that reduces childbearing during famine).

Generally, among other anatomical results, testosterone contributes to broad shoulders and estrogens promote development of a wide pelvis for childbirth. Yet there is much normal variation, and female runners and soccer players, etc. are selected by performance in running speed which often means narrower hips. Testosterone increases aggression, and some normal women produce more adrenal testosterone than others, which likewise can be a sports advantage.

Thus chromosomes and variation in hormone levels drive anatomy, but not always, as seen in the apparent female girl baby (Fig. 7) with XY chromosomes. Testes are present but body cells lack receptors for testosterone so the rest of the body develops as female.

But for a very small portion of children, their "feeling" of being masculine or feminine may not match chromosomes or hormones or anatomy. This is realized by age 5 or 6, well before puberty and sexual attraction develop. This feeling does not change day-to-day. John Money documented these cases and borrowed the term "gender" from linguistics in the 1950s.

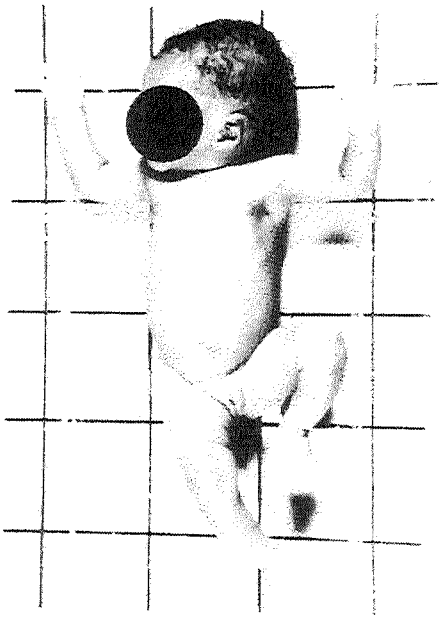

Figure 7. The body cells of this newborn baby are all XY, which should indicate a boy. But with androgen insensitivity testicular feminizing syndrome, she is indistinguishable in appearance from a normal female. Body cells are all 46,XY. Reprinted with permission.

Brain research that explains this originated with Roger Gorski of UCLA who injected pregnant rats with testosterone found that the half of the litters who were female also acted male. He then examined brain slices and found a region where these female offspring had a male, not female brain region.

This research was further expanded by Swaab in the Netherlands. Using brain bank tissues donated after death, Swaab confirmed that the feeling of masculinity or femininity (gender) was determined by the structure of the brain region as shown in Figure 9.

What was simplified as "biological sex" is now known to be determined by a combination of anatomy that varies, chromosomes that vary and hormones that vary and these may not always align. And finally brain structures that develop before birth provide a sense of gender that also may not align with these other factors.

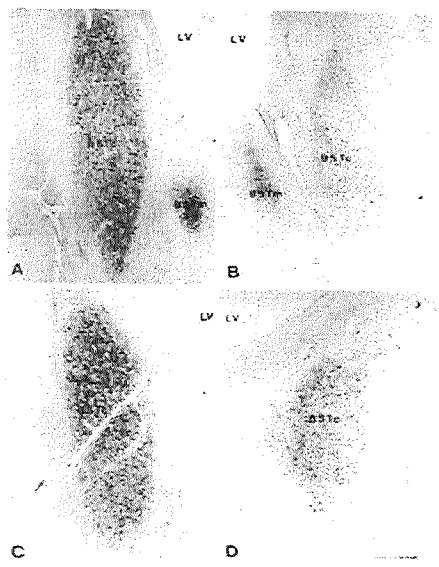

Figure 9. The volume of this brain area related to gender identity, the central subdivision of the bed nucleus of the stria terminalis (BSTc) is larger in men than in women: A)heterosexual man, B: heterosexual woman, C)homosexual man, D) male-to-female transsexual. After Zhou, Hofman, Gooren and Swaab, 1995. Published with permission.

These variations in both chromosomes, hormones and anatomy, as well as inborn gender identity, have existed throughout history. Kansas provides a very exceptional history of one case from Coffey County, Kansas a century ago. It clearly shows how gender identity is not a decision that changes day-by-day.

When anatomy and hormones can be aligned beginning at age 5-6, the person develops an anatomy that is also aligned with their gender, they will have no physical benefits.

The relatively recent discovery of these ever-more-complex factors in human development do take some time to enter into the training of medical professionals and into textbooks used in science classrooms. So to some extent this discussion reflects the slow speed with which this science is transferred to the public

A fuller discussion with more illustrations is available in the *Kansas School Naturalist* titled "XX-XY" and accessed online at:
https://sites.google.com/g.emporia.edu/ksn/ksn-home/vol-63-no-2-xx-xy-the-biology-of-sexual-identity-and-gender-identity

Respectfully,

John Richard Schrock

Transgender Compassion—a Century Ago

The first documented transgender male transition in the United States was undergone by Kansan A. L. Hart. Lucille Hart, born on October 4, 1890 in Halls Summit, Coffey County, Kansas was female at birth. However, early in his childhood, Hart felt he was a boy.

Thirty-one years later, the *Halls Summit News* described how "Young Hart was different, even then. Boys' clothes just felt natural. [Alan] always regarded [him]self as a boy and begged [his] family to cut [his] hair and let [him] wear trousers. [Alan] disliked dolls but enjoyed playing doctor. [He] hated traditional girl tasks, preferring farm work with the menfolk instead. The self reliance that became a lifelong trait was evident early: once when [he] accidentally chopped off [his] fingertip with an axe, Lucille dressed it [him]self, saying nothing about it to the family."

It would be 50 years before the concept of "gender" was even recognized. A century ago, any departure from assigned male or female roles was forbidden. Hart had to attend school in a dress and behave as a girl.

Hart continued his studies, graduating from Albany College in 1912 and securing his M.D. degree from the University of Oregon in 1917. Having lived unhappily presenting as a woman, Hart sought help from doctors at the University of Oregon for sex reassignment surgery. Such surgery had been conducted in 1906-07 in Germany but this was the first case in the U.S. of the removal of a healthy uterus and ovaries due to a patient's desire to transition.

In 1918, he legally changed his name to Alan and married Inez Stark and moved to Gardiner, Oregon where he began practicing medicine.

At this time, there was no safe source of testosterone hormone to complement the surgery. According to an online biographical note, safe synthetic testosterone finally became available after World War II and only then was Hart able to grow a beard, shave, and develop a deeper voice.

Alan's first marriage ended in divorce in 1925 but his second marriage to Edna Ruddick was lifelong.

Hart secured his master's degree in radiology and began work in a series of positions where he developed the use of X-Rays for tuberculosis detection. His leadership in TB screening earned national recognition and "saved thousands of lives." Hart died in 1962, a time when John Money was just beginning to unravel the complexities of gender and sexual identity.

After his transition, Alan Hart lived exclusively as a man and never sought publicity. Nevertheless, various groups later attempted to claim that Hart and his wife were lesbians. Such assertions go against all the evidence. Transsexuals want nothing more than what we all wish for: to live our intimate lives in peace and quiet. Tabloid news and media as well as the actions of biology-ignorant politicians do nothing to ease the distress felt by those who need to make these quiet medical transitions.

Those who feel threatened by the existence of individuals who were not born with the normal alignment of gender and sexual identity can learn much from the current cases described by eight transgender kids themselves in "FRONTLINE: Growing up Trans," a DVD available from PBS.

To me the most poignant part of Alan "Lucille" Hart's biography is his account of his happiness during his childhood when he stayed on his grandparent's farm in Coffey County, Kansas. All through this time, he had to present and dress at school as a girl. But on the farm, he was allowed to dress as a boy and play boy's games. His grandfather made him boy's toys to play with. And later, when his grandparents died in 1921 and 1924, both obituaries listed Hart as "grandson." Against the overwhelming and profound ignorance of that time, his grandparents embraced him for who he was.

It is unfortunate that today much of our nation continues to remain mired in the ignorance of the 1800s. —To choose to remain blind to this biological issue. —To show no concern for those who are unfortunate enough to have been born with gender or sexual ambiguity.