GLAND THAT MAKES THE MAN

A number of years ago, Henry L. Mencken ranked the respectability of body organs. Heart and lungs, he found, were quite discussable, kidneys barely mentionable, the liver beyond the pale of polite conversation. There has been a decline in prudery since Mencken wrote his piece. Today, we accept one body organ as being quite as respectable as the next — with one exception. The exception, of course, is the gland that plays the largest role in shaping any man's life — the testicle.

This remarkable gland possesses quite as much dignity as any other body organ. It is far more complex than the heart, which is the simplest of muscular pumps; more interesting than the component parts of the digestive tract. It is indeed, more directly associated with a man's well-being than any other organ.

No one is quite sure at what period during life this gland begins to play a major role. But activity of the testes is at minimum levels until the age of puberty. Then the twin glands spring to action. The effect is immediate. The boy's voice deepens, a beard appears, there are other changes. The sexually neutral individual develops characteristics that are unmistakably male. In late mid-life, activity of the testes begins to taper off. By the age of 60 activity is at about the level of the prepuberty period.

The gland serves a dual function. It is a chemical manufacturing plant, producing an incredibly potent hormone which it empties into the blood stream. Second, it produces the sperm cells upon which the creation of all new life depends. These cells are the most remarkable cells produced by the human body.

Earliest man knew that removal of the gland changed the fiery bull into the docile ox, the wild stallion into the mild gelding, the predatory male into the placid harem guard. But most knowledge about it has been gained only in recent years. And even now, there are wide gaps in the research.

First, look at the structure of this gland. It is ovoid in shape, about two inches long and one-and-a-quarter inches at its greatest diameter. Early anatomists cut through it and saw what looked like strands from a tangled ball of yarn. The organ was largely composed of an intricate system of tiny tubules.

Centuries passed before the confusing skein of tubes was untangled. Then working under water, with the finest dissection instruments, a research man at the University of Michigan separated the gossamer strands. Each testis was found to contain nearly 1,000 tubes, each the size of fine sewing silk. The tubes are one to two feet long. In total length they would stretch nearly half a mile.

It is in these tubes that sperm cells are manufactured. The cells are passed along to a large collecting tube, the epididymis. This duct, attached to the upper part of the testis, is about 20 feet long. It bends and twists in tight coils. As sperm cells move slowly through the epididymis, they gradually mature. The growing-up process is completed in the *vas deferens,* or spermatic duct. This tube, an eighth of an inch in diameter and a foot long, passes vertically upward from the gland.

It is this cord-like duct which supports the glands, permitting them to hang loosely as a protection against injury. The duct comes near the surface of the skin in the groin. Tying off this canal produces a permanent sterility. The operation is frequently performed on mental misfits.

Until a short time before birth, the testes are inside the body. Then they descend to the skin sac. In a sense, it is astonishing that nature didn't give them the protection of a permanent home inside the body, in the same

manner that it gave protection to a woman's ovaries. Some animals — the elephant for example — do have this protection, with testes contained in the abdomen.

But there is good reason for man's glands of maleness being outside the body. The skin sac which contains them is, in a sense, an elaborate air-conditioning system. Unless the testes are kept at a temperature a degree or so cooler than the rest of the body they cannot produce sperm cells. In an occasional person, these glands fail to descend properly. Such people are always sterile until the glands are brought into their proper place by surgery or hormone treatment.

To see that the glands are properly cooled, the skin sac in which they hang is equipped with an elaborate system of sweat glands. Evaporation of the moisture they produce maintains an even temperature. There are other controls as well. When chilled by a cold shower, the skin contracts — drawing the glands closer to the body for warmth. In a Turkish bath, it relaxes, to bring all possible cooling action into play.

At times, this vital cooling system fails. The high fever that goes with disease often produces a temporary sterility. In one set of experiments, a transient sterility was produced by keeping the glands wrapped in wool for several weeks. Hot baths are generally blamed for the declining fertility of civilized people.

Climate also plays a large role in determining male fertility. When the weather is too hot, the testes cannot function efficiently in producing sperm cells. This explains why tropical people are often on the borderline of sterility, and why northern people are almost explosively fertile. In this respect the Swede, the French Canadian, will shame their Latin brothers — despite all the legends to the contrary.

Physicians have been able to transplant certain tissues from one individual to another: bone, cornea, cartilage, a few others. But the testis is apparently designed for the use of its owner only. All efforts to transplant these

glands from one man to another have failed. Similarly, efforts have been made to transplant glands from animals to man. These, too, have failed.

The sperm cells produced by the testes are the smallest of all human cells. Something like 100 *billion* could be contained in one cubic inch!

These cells go through periods of youth, middle and old age. Too frequent sexual indulgence launches immature cells which are incapable of producing new life. On the other hand, if cells accumulate in the body for too long a period they grow old and die.

Each cell has an oval head and a hair-like tail. The tail is the sperm cell's means of locomotion. By kicking it, he can move himself along.

The head, despite its microscopic size, is probably the most intricate of all tissues. All other body cells contain 48 chromosomes. But the sperm, like the egg cell from a woman, contains only 24. There is a good reason for this. When sperm and egg combine to make the initial cell of life, each contributes its complement of chromosomes to make up the normal 48.

The sperm cell's 24 chromosomes contain thousands of genes, too small to be seen by any microscope. These are the factors which determine inheritance. A father does not give his child his blood, as such, but he directly passes along his genes. They combine with the genes in the mother's egg cell to shape the life of any child. One gene or set of genes will give the child his father's red hair, another group will give him his mother's musical talent, and so on.

In this connection, note that the mother has nothing to do with the sex of the child. Sex is determined solely by chromosomes in the male sperm. Half of all male cells contain the Y chromosomes which produce boy babies. The other half contain girl-producing X chromosomes. The woman's egg cells, on the other hand, contain only girl-producing X chromosomes.

Thus, if Y sperm from the father fertilizes the egg, a boy child results. If it is X sperm, there is a girl baby.

Fertilization of the female's egg cells calls for the interaction of a number of events, each timed to hair-line sequence. By themselves, sperm cells could never produce a new life. In order to achieve their destiny, they need a highly favorable environment.

For example, they need nourishment once they are launched on an independent existence. Further, they need a fluid environment in which to live. This fluid nourishment is supplied from two sources — the prostate gland and the two seminal vesicles. The fluid from these sources is slightly alkaline. This is to overcome the normal acidity of women, which would kill the sperm. The fluid contains a small amount of sugar, to provide energy for the sperm cells.

Sperm cells are launched in incredible quantities; 500 million at a time would be a good average figure. Their migration toward the egg cell of the woman is a drama of the microscopic world which has no counterpart in the scopic world. The odds against any particular sperm ever fulfilling its final destiny, reaching and fertilizing an egg, are 500 million to one.

Mountainous obstacles stand in the way of the fragile sperm as it moves through the uterus and into the Fallopian tube where it meets the egg. A slight fold of tissue is a hurdle greater than Mt. Everest would be to a walking man. A slight flow of mucous is a torrential Niagara.

At best, the sperm, fighting with all the meager energy it possesses, can travel no more than one-20th of a millimeter per second. At this rate, an hour would be required to move seven inches — which is about the d istance the sperm must travel to meet the egg.

Although it has directional sense, the sperm lacks the sureness of, say, the homing pigeon. On its way, it will twist and turn, losing time and losing distance. Although no one can be sure

about such things, most research men guess that it takes the sperm about two hours to reach the egg.

The slaughter that takes place along the way makes any battles that men have fought seem tame by comparison. Tens of millions of spermatozoa die of exhaustion. Other millions perish for lack of sugar to nourish them; still others are victims of an unfavorable environment.

Yet, as time runs out, the migration continues, a few stalwarts surviving. Within four hours, exhaustion will overtake the vast horde. They will lose the ability to move, and once this is lost they will die.

This, then, pretty well summarizes one testicular function: production of the sperm cells which are the creators of new life. The second testicular function is to produce the hormone of maleness, testosterone.

Before puberty, the testes produce only meager quantities of the hormone. Then, at the time of puberty, the testes are triggered into action by a secretion from the pituitary gland, which lies under the brain. Under this stimulus, the testes start producing dozens of times the amount of hormone produced in pre-puberty days.

Almost immediately, the boy's voice deepens, facial hair sprouts, sexual organs enlarge. Testosterone, apparently, is the common denominator for m a l e n e s s throughout the animal world. The hormone produced by man is chemically identical with that produced by a rooster, stallion, or lion.

How potent this chemical is in determining maleness of any animal can be demonstrated by any one of a dozen experiments. When testosterone is injected into a chick, the chick begins to behave like a grown rooster. He emits canary-like squeeks — the best he can do in the way of crowing.

When it is injected into a capon, the creature grows a comb, starts strutting. When it is given to male mice that have been castrated they become normally belligerent, start fighting. Its effects on the human male are much the same. One castrate re-

ported that the magical chemical gave him courage, for the first time in his life, to talk back to a taxi driver.

Testosterone has been a godsend to hundreds of soldiers desexed by land mines. It has converted listless, apathetic men into vigorous human beings, normal in all respects but one. They are sexually capable, but unable to have children, since they lack sperm cells. In sum, they are potent but sterile.

Such men may be treated with daily pills. Or, a pellet of hormone may be implanted under the skin. This minor operation is performed under local anesthesia, takes only a few minutes. A slight incision is made in the leg, the hormone implanted, and the wound closed with a stitch or two. Gradually dissolved in the blood over a period of four to six months, the pellet is, in effect, an artificial gland.

Production of testosterone reaches a peak in the 25-to-35 age range, then tapers off gradually. By the age of 60, production is a gradual process. But in some cases there is a sharp drop. In this event, a man may suffer some of the same menopausal symptoms a woman experiences when her ovaries cease functioning.

Studies of one large group of men with such symptoms showed a common set of complaints. Eighty-five percent were depressed, 65 percent sleepless 50 percent suffered periods of uncontrollable excitement. A third of the group had frequent fits of weeping and a few either contemplated or attempted suicide. In virtually all cases, hormone treatment banished the unpleasant symptoms.

You have heard a great deal about the male hormone staying the aging process — making the old young again. Take such statements with a handful of salt.

Testosterone won't prevent aging. Nor will it restore youthful vitality to older men. If they are suffering menopausal symptoms for markedly decreased production of the hormone, it will restore chemical balance to their bodies. And that is just about all that it will do.

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To sum up, the testes produce a dazzling chemical

stuff. They manufacture the miraculous sperm cells upon which all life depends. Instead of looking on these organs as being vaguely indecent we might better regard them in their true light. They are among the most remarkable organs in the body.

They are, quite possibly, *the* most remarkable of all body organs. — *By J. D. Ratcliff from Science Digest.*

"AFTER YOU, MY DEAR ALPHONSE!"

About forty years ago there was a popular comic strip called *Alphonse and Gaston.* Two extremely courteous Frenchmen were always trying to outdo each other in politeness. Many a comic impasse was reached as Gaston would insist, "After you, my dear Alphonse," and Alphonse would reply, "No, you first, my dear Gaston!"

Funny as they were, there's no question about who should come first. The other person, of course. He should be first to order the meal, first to go through the door, first to be offered the best seat.

And what does it cost you? Generally he or she responds as Alphonse would with "After you, my dear Gaston!" He or she will try to outdo *you* in politeness as long as politeness is in the air. So you end up first at least fifty per cent of the time.

But if you are to grab the opportunity, the money, the edge in any kind of an activity, you automatically give warning that the other person should start looking out for himself, too. Instead of trying to outdo in courtesy, he may begin to outdo you in selfishness.

"After you, my dear Alphonse!" Try that simple formula for just one day. See how many times you can give the preference to the other fellow, friend or stranger. See how much you *gain,* by outscoring him in politeness and courtesy. — *James T. Mangan.*