

MONKEY BUSINESS

Charles Edouard Brown-Séquard (1817-1894) was a pioneer in transplant surgery, discoverer of the nerves which regulate the caliber of arteries and was among the first to appreciate the importance of the adrenal glands. He's sometimes recognized as the father of experimental endocrinology and yet his name is barely recalled for any of these.

Born on the French Crown Colony of Mauritius, an island in the Indian Ocean, he never knew his American father Charles Brown, a merchant sea captain who probably was lost at sea. He was devoted to his mother and was devastated when she died so that in her honor he attached her maiden name to the mundane Brown to create the memorable eponym Brown-Sequard.

Charles Brown-Séquard often used himself as an experimental subject. He counted the number of gray hairs in his beard and measured the force of his urinary stream and once he nearly died after covering himself from head to toe with varnish in order to investigate the function of skin – a quick-witted student saved his life by removing the sealant with alcohol. He worked 18 or 19 hour days, typically going to bed at 8 o'clock in the evening and arising at about 2 in the morning. He said, "I want to know something different, something better, than what average doctors know...if one way doesn't work, try another."

Brown-Séquard led a peripatetic life: mainly in France but with three stretches in America and a period of medical practice in London. He crossed the Atlantic some sixty times in an era when that was a long and taxing journey and his lectures on brain and spinal cord function drew enthusiastic audiences in the United States and Europe. Because of his conviction that advances in medicine required animal experimentation, Brown-Sequard drew the wrath of anti-vivisectionists but he was undeterred and relished debating his theories.

Wherever he went he was controversial but respected as an innovative physiologist. His eccentric personality combined with fluctuating moods, occasional grandiosity and lack of social graces suggested a bipolar disorder but, whether true or not, he achieved great acclaim. He received numerous honors and memberships in learned societies and when he died at age 87, the dean of

Harvard Medical School, recalled, “If his reasoning power had equaled his power of observation he might have done for physiology what Newton did for physics.” But why this qualification? How had Brown-Séquard’s powers of reasoning failed him?

The answer was related to the fact that Brown-Séquard came to believe that if the internal secretions of a ductless gland from a living animal could be introduced into the blood of humans who were suffering from a lack of that secretion, important therapeutic effects would be obtained. All well and good but then he postulated that the testicles manufacture a substance which in some manner energizes the nervous system. Moreover, the weakness which accompanies old age might partially reflect loss of this energizing property - and all of this could be reversed by injecting a testicular extract.

In 1889 the 72 year old doctor read a paper at a scientific meeting in Paris that shocked the audience. He described how after preliminary studies in animals, he’d injected under his skin a solution prepared by grinding the testicles of dogs and guinea pigs. After a series of injections over a two-week period, he noted a marked increase in strength and stamina, improved mental energy and concentration and more regular bowel movements. He said, “All has changed, and I’ve regained the full force that I possessed.” The effects persisted for about a month and then wore off.

To Brown-Séquard’s dismay, the popular press had a field day distorting his words. The implications were spectacular and, inflamed by wild journalistic reports, the public contemplated sexual rejuvenation and longer life. Opportunists tried to replicate his method of injecting testicular extracts and reported remarkable effects: the paralyzed could walk, the lame threw away their canes and crutches, the deaf could hear and the blind see. A drug company pedaled an elixir called *Spermine* that included semen, calf’s heart and liver and bull’s testicles among other ingredients. Brown-Séquard was misquoted as having claimed that he’d discovered the “elixir of life.”

No doubt he deluded himself, but Brown-Séquard made his data available for all to review and refused to endorse any commercial products capitalizing on his work. Although he’d only reported the mild non-specific effects of a tonic, in other

hands when testicular extracts from rams and bulls failed to produce the hoped-for effects, he was ridiculed as a foolish old man and vilified as a charlatan. He'd provided testicular extracts to physicians at no charge so long as they would report their results to him. Some 1,200 doctors availed themselves of his offer and more than 1,600 cases were injected with testicular extracts - but with inconsistent results.

Charles Brown-Séguard died of a stroke about four years after his self-injections so evidently they hadn't extended his own life -- but his work opened a veritable Pandora's box. Testicular extracts may have failed to restore youthful vigor, but in due time even his critics acknowledged that outcomes of "organotherapy" were favorable for certain other conditions, e.g. hypothyroidism. Sober scientists theorized that organ extracts when combined with dietary and hygienic modalities could rejuvenate and extend life. Elie Metchnikoff, who worked in Paris with Louis Pasteur and in 1908 shared the Nobel Prize in Medicine, famously preached a lifestyle which featured Bulgarian yogurt and regular injections of animal sex glands.

Serge Voronoff a Russian-born naturalized French surgeon worked for a short time with Brown-Séguard but although he self-injected his mentor's "juice" there was no noticeable effect. However, he reasoned that, contrary to frequent injections, glandular transplants would allow prolonged hormone production and, after testing his theory on more than 500 rams, goats and a bull, Voronoff reported that older animals transplanted with younger animal's testicles regained size, strength and lost vigor - in effect, he'd created a race of super-sheep. In June 1920 Voronoff transplanted thin slices of chimpanzee and baboon testicle into the scrotum of a human. This was followed by forty more transplants on men of different ages and by 1923 Voronoff drew applause from 700 surgeons gathered at an international meeting in London when he explained that sex drive may improve, memory and concentration benefit and monkey testicles could keep a man healthy and active for a century and a half -- at which time he would simply collapse! He charged exorbitant fees

In later years Voronoff claimed that science was close to creating a race of supermen and superwomen; although the female had "a more complicated physique" he predicted that by grafting monkey thyroid, pituitary and ovary

women could live to 150. He even tried reversing the process, transplanting a woman's ovary into Nora, a female monkey and then inseminating Nora with human semen but with no success – nevertheless, a novel was written about “Nora, the Monkey Turned Woman.”

Celebrities and athletes clamored for monkey glands. In addition to transplanting chimp testicles to men, he did the same for women using ovaries. He declared, “I dare assert that the monkey is superior to man by the sturdiness of its body, the quality of its organs, and the absence of those defects, hereditary and acquired, with which the main part of mankind is afflicted.” Newspapers breathlessly reported that he even transplanted the testicles of executed criminals into millionaires. In 1920 he wrote, “The sex gland stimulates creative activity as well as muscular energy and amorous passion. It pours into the stream of the blood a species of vital fluid which restores the energy of all the cells and spreads happiness.” He insisted that any romantic improvements were just a side-effect of a transformation that healed the patient's entire being - a process that he called “rejuvenation.”

Between the 1920s and 40s, more than 2,000 patients from all over the world had received monkey testicles. Voronoff married a wealthy American (Evelyn Bostwick) and his clientele were drawn from the wealthy international set. Before long the glands were in short supply and in order to keep up with demand Voronoff opened a chimpanzee breeding center in a chateau that he bought on the Italian Riviera (Grimaldi.) He declared that it would be a great factory designed to supply “spare parts” for the human machine. Many celebrities visited - among them the opera star Lilly Pons who reportedly once got too close to a cage and was kissed by an ape.

Serge Voronoff had a magnetic personality and was a natural showman - although he objected to being compared to Barnum. He led a lavish Parisian lifestyle, renting a whole floor of one of the fanciest hotels where he put up valets, chauffeurs, secretaries and two mistresses. But alas, the anticipated results were illusory, the monkey business gradually fell off and, inevitably, fame was followed by ridicule. Although Voronoff quit performing the procedures around 1930 he continued to proselytize and do research at Castle Voronoff. When World War II broke out he was safe in the United States and when he returned to France after the war he found that his castle was destroyed by

bombing. By the time the mad scientist died in 1951 he was long forgotten.

Nevertheless, some of Serge Voronoff's ideas were correct. He wrote "there is no doubt that the surgery of the future will consist largely in preserving and, when necessary, replacing the glands of the human body, in order to preserve life, vigor and health...Does any scientific discovery of the ages exceed this in its importance to the individual and the race?" He predicted that like with the thyroid and adrenal, the mysterious testicular substance someday would be discovered obviating the need for transplants from a different species. Indeed testosterone was isolated in 1935 and nowadays it is promoted as enthusiastically as monkey glands once were, perhaps even more so - although the benefits remain doubtful.

Viennese physiologist **Eugen Steinach** also was familiar with Brown-Séquard's work and believed that gonadal secretions were responsible for sexuality both in males and females, he developed the so-called "Steinach Operation" which was merely a unilateral vasectomy. He theorized that "secretions associated with ejaculation" would back up throughout the body and that ligating the vas deferens on one side would cause compensatory increased hormone production on the other side. The result would be increased vigor and sexual potency, hair growth, improved eyesight and reversed senility in men. For women the same benefits could be achieved by radiating their ovaries. Whereas Voronoff had promised that his procedures "would turn grandmothers into debutantes," Steinach more modestly acknowledged, "We cannot transmute an old hag into a giddy young damsel...but under certain circumstances, we can stretch the span of ... usefulness, and enable the patient to recapture the raptures, if not the giddiness, of youth."

Steinach began operating on wealthy patients in 1920 and three years later an famous scientist (Ernest Starling) cautiously reported to the Royal College of Physicians in London:

[Steinach] claims to have produced an actual rejuvenation in man, and thus to have warded off for a time senility with its mental and corporeal manifestations. Further experiments and a longer period of observation are necessary before we can accept these results without reserve, but it

must be owned that they are perfectly reasonable and follow as a logical sequence many years' observations and experiments in this field.

Naturally, people clamored for the procedure or similar approaches. Women received unilateral ovarian radiation for the same reasons and within a few years most major American and European cities boasted vasectomy specialists. The names of the famous rejuvenators became a verb: men confided that they'd been "Steinached" or "Voronized." The aging Irish poet William Butler Yeats lauded his "second puberty" and claimed that his creative power – both literary and sexual – had been restored.

Sigmund Freud was less enthusiastic. The 67 year old psychiatrist had a vasectomy performed in 1923 by one of Steinach's associates (Steinach was not a surgeon and others performed the operations.) Freud already was undergoing surgeries for his oral cancer and hoped that being Steinached might prevent recurrences as well as improve his general condition and capacity for work - and also his "sexuality." But some eight months after the operation, Freud wrote to a friend, "I have felt nothing reassuring from the effects of the Steinach operation."

Both Voronoff and Steinach were Jewish but, fortuitously, neither was in France or Austria when World War II began so they survived. When celebrating his 81st birthday in 1942 Eugen Steinach reported, "I'm spiritually feeling many years less than my mathematical age." He died two years later at age 83. Voronoff outlasted him, dying in 1951 at age 87.

Swiss surgeon Paul Niehans was a true believer and established a clinic where he injected animal cells into humans. His patients included Pope Pius XII, King Ibn Saud, Konrad Adenauer, Charlie Chaplin and Noel Coward. When Coward noted that the lab herd of sheep included a single black one, he said, "I see the doctor is expecting Paul Robeson."

Drs. Brown-Sequard, Steinach and Voronoff all resented criticisms that they were frauds and no doubt their misguided human experiments opened the door for subsequent advances in endocrinology and hormone replacement therapy. Science often gets things wrong because it's shaped by the time and place in

which scientists work and although they all made mistakes which in retrospect seem foolish, in the end they were on to something.

An American from rural Kansas **John Romulus Brinkley** *also* was on to something - but up to no good! He took notice of the French craze for glandular rejuvenation and during the 1920s and 30s he became one of the most famous and richest men in American. Although he had a phony medical degree "Doc" Brinkley was a huckster who promoted himself to the gullible as "the people's doctor." He grew up dirt poor but lived like a prince and hobnobbed with royalty. The basis of his phenomenal success was testicles - not monkey's but goat's. The self-styled "Ponce de Leon of Kansas" advertised that if a man used his products he would become "the ram that am for every lamb." He said that goat glands could work wonder on 27 different conditions but cautiously claimed only 95% success.

Doc Brinkley had "balls" - plenty of them - but he didn't bother actually grafting goat testicles - he'd merely drop them into a man's scrotum where he alleged they'd become "humanized." He charged \$750 for goat glands but \$5,000 if you wanted real human testes. Although he soaked the rich, this Robin Hood didn't give back to the poor - there were no freebies. The near destitute could mail-order a Special Gland Emulsion for \$100 that could be self-administered using a rectal syringe. Doc Brinkley was a marketing genius and shamelessly promoted himself on his own powerful radio station that was located over the border in Mexico. From there he'd diagnose call-ins sight unseen and then sell them unnamed drugs at exorbitant prices.

When government watchdogs got too close for comfort, the Doc decided to join them and twice narrowly failed to win the governorship of Kansas. Apparently, establishment politicians fixed the votes against him (sound familiar?) He flew his own airplane from place to place spreading the message of redemption and rejuvenation and even considered a run for president of the United States. However, he felt himself betrayed by enemies and took to evangelism. In one sermon he said, "I had rather save a soul than be president of the United States - or even king of the world."

Eventually the law caught up with Doc Brinkley but when he died in 1942, his fiercest critic, the president of the AMA Morris Fishbein, acknowledged “The centuries to come may never produce such blatancy, such fertility of imagination and such ego.” (He was wrong about the date: Donald Trump was born just four years later.) William Alan White wrote, “What a little tinkering with his character might have done...A little more honesty here, a little more intelligence there... would have made him a really great leader of men.”