Pot Safari by Peggy Mann
Summarized Key Medical Points-2/4/2020 by Jesse LeBlanc

From the book "Pot Safari" by Peggy Mann. Woodmere Press, New York, 1982

- **Chapter 2, The "Pot Plantation"**
  - Page 12
    - Dr. Carlton Turner-Former Director of the Marijuana Research Project at the University of Mississippi and former Director of the White House Drug Policy Office: "…It's (marijuana) by far the most complex of all the illegal drugs…we've identified 421 different chemicals. From eighteen different chemical classes. For example, there are 50 different types of waxy hydrocarbons-which help make the tar in the pot smoke. There are 103 different terpenes, most of which, like the tars, are very irritating to the lungs. Twelve fatty acids, Eleven steroids. Twenty nitrogen compounds. There are toxic agents, including carbon monoxide, ammonia, acetone, and benzene. There are also cancer causing chemicals including benzathracene and benzoprene. And there are found in pot smoke in amounts which are 50 to 10 percent ***greater*** than are found in tobacco smoke…And when marijuana is ***smoked***, the 421 chemicals turn into still ***more*** chemicals. Over 2,000 of them…Further, when these 2,000 chemicals are metabolized-broken down so the body can get rid of them-many hundreds more chemicals are produced…Only a very small percent of the THC in a single joint gets through the blood-brain barrier to create the 'high.' Which gives some indication of what a powerful chemical THC is."
    - Peggy Mann: "What is the blood-brain barrier?"
  - Page 13
    - Dr. Carlton Turner: "It's a protective system made of capillary walls and cell membranes. It acts as a sieve to prevent certain toxic chemicals in the bloodstream from entering the brain."
    - Peggy Mann: "If only a small amount of THC gets through to the brain, what is the rest of it doing?"
    - Dr. Carlton Turner: "It's acting on the lungs, on the sex and reproductive organs. On other organs. In fact, on every cell in the body."
    - Peggy Mann: "And what about the ***other*** 60 cannabinoids? What are ***they*** doing?"
    - Dr. Carlton Turner: "Thus far scientists have studied only four of the others. Three of those are not psychoactive. They have nothing to do with the high. You might think, therefore, that at least ***they*** have no harmful effects on the body. Not true. Researchers have shown that the ***non***-psychoactive cannabinoids are even more harmful in many ways than the psychoactive ones…This so called 'simple weed' is really a Pandora's Box of unknowns. And the more we find out about it, the less we like the look of what we're seeing."
  - Page 14
    - Dr. Carlton Turner: "…THC only comes to life when you smoke it. Or cook it. Or when the plant is stored for a long time and starts to rot. That's why rabbits who chew on the fresh leaves, or Indians who eat it in salad, don't get stones. And neither do bees."
    - Dr. Carlton Turner: "…Because the cannabinoids keep changing. They not only change while they're in the growing plant, but there are different THC strengths in different parts of the same plant. What's more, the strengths varying according to the age of the plant and the sex of the plant. There are male and female plants. And, in this case, the male are the weaker of the species-as far as THC goes…Even after the joint is made, THC-and the other cannabinoids-keep jittering around. Their strength varies according to the length of time it's stored, the place it's stored in, the temperature it's stored at."
    - Dr. Carlton Turner: "…researchers have to store it (marijuana) in the freezer, otherwise, the Delta-(-THC will start to decompose into several other cannabinoids. Also, because this is such a temperamental drug, researchers are asked to submit their samples o us every few months for re-analysis."
- **Chapter 8, The Rosenkrantz Rats**
  - Page 56
    - Dr. Rosenkrantz (Director of Biochemical Pharmacology at the EG&G Mason Research Institute of Worcester, Massachusetts):

- "We exposed different groups of rats to pugs of pot smoke which equaled the human equivalency dose of one to six joints a day."
- "We found that the rats we autopsied after two months showed no lung damage. But after three months, we began to start to see rather startling changes. And the changes grew much more serious as the smoke exposure went on. There was extensive lung inflammation and the deepest air passageways were blocked with tissue debris…It's a serious condition which can lead to lung failure. Not only in the rats, but in the human being."
- "We stopped the smoke exposure of all the rats after eleven months. Ten we sacrificed half of that group, and looked at their lungs. We let the rest go without pot smoke for another 30 days. Ten we sacrificed them and looked at their lungs…there was virtually no difference between the two groups. Even after one month of no-smoking, the lungs were still in terrible condition. One month in a rat's life is two years in a human life."
- "We found that the lung damage brought about by the pot smoke came faster and was more severe than the damage done by tobacco smoke."
- "When the lung tissue is irritated by foreign matter-something the macrophages consider an enemy-they are the first line of defense in the immune system to mobilize and descend on the invader. When we see lung tissue dark with an army of macrophages we know that the signals have gone out. Something is very wrong. Well, in our macrophages study, after 180 days-six years of daily smoking in human life-some of the small airway passages were blocked solid with macrophages…they had clumped together in groups."
- "…much of what Tennant found in his human subjects, we had already found in the lung tissue of our rats. Including-precancerous lesions. We found grandulomatous inflammation and cholesterol clefts, which are pre-cancerous stages in both animals and in man."

- **Chapter 9, The Lung Effect Which Don't Show**
  - Page 61
    - Peggy Mann: (referring to Dr. Dietrich Hoffmann of the American Health Foundation)
      - "But the study was done in 1971. In those days a typical street joint was very weak. It averaged ½ of one percent THC."
      - "Both 'smokes' (referring to unfiltered marijuana and tobacco cigarettes) contained roughly equal amounts of such irritants and gaseous toxic agents as carbon Monoxide, ammonia, benzene-and some with names half as long as the joint itself-mythylethylnitrosamine-for example. Indeed, aside from the fact that cigarettes contain nicotine and marijuana contains cannabinoids, both 'smokes' had roughly the same compounds, including lung irritants and potential carcinogens (cancer-causing agents). Dr. Hoffman reported that the carcinogens benzanthracene and benzopyrene were present in marijuana smoke in amounts 50 to 100 percent greater than in the smoke of the unfiltered high-tar cigarette!"
  - Page 62
    - Peggy Mann: (referring to findings from a study by Dr. Gary Huber, Director of Harvard University's Smoking and Health Research Program) "Working with rats, Huber had found that marijuana activates-by some 200 percent-enzymes which can contribute to the 'eating' or digesting of the lung itself."
  - Page 63
    - Peggy Mann" (referring to a study of Indian bhang and charas users) "This clearly showed that the more potent the pot, the more likely it was that the user would develop a lung disease."
  - Page 64
    - Peggy Mann (referring to a lung study of pot smokers by Dr. Donald Tashkin, Director of the Lung Function Laboratory of UCLA Hospital) "Tashkin found 'significant lung

function impairment in several areas'. The impairments were 'similar to those found by other researchers who had smoked tobacco moderately to heavy for many years."

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  - Barry Calvarese: (the "chief investigator" for Dr. Donald Tashkin's lung study)
    - "Another way of putting it is this: one joint caused far more airflow resistance than 16 tobacco cigarettes."
    - "These pot smokers had a 25 percent increase in airflow resistance, compared to the controls."
    - "Mucous secretion and clogging. Irritation and inflammation in the larger airways."
  - Dr. Donald Tashkin: (commenting on his first marijuana study which had shown that a THC aerosol spray dilated the bronchial tubes of 11 healthy male volunteers, which was reported in the press as a cure for asthma)
    - "Unfortunately, very little press coverage was given to our follow-up study which showed that when we tried the same dose of THC spray on five subjects who actually ***had*** asthma, they all complained of cough and throat and chest irritation, and two of them promptly developed asthma attacks."
  - Peggy Mann: (dialog continued on page 67) "Sometimes the 'side-effects' of misinformation about marijuana as medicine can go a lot further than anyone likes to realize."

- **Chapter 10, Dr. Tennant's Landmark Lung Study**
  - Page 68 and 69
    - Dr. Forest Tennent: (Executive Director of the largest drug treatment program in California and Retired US Army Battle Surgeon) "…we kept seeing all of these soldiers who came in by the dozens all complaining of identical-sounding symptoms. Coughs, sore throats, chest pains. But these were on part of the picture. Lots of acne. Nausea. Depression. Fatigue. And apathetic-what we now call the 'amotivational syndrome'. Also paranoid-type symptoms. 'My captain's out to get me.'"
    - Soldier-Patient speaking to Dr. Tennent: "I guess it's all of the hash I've been smoking."
    - Dr. Forest Tennent:
      - "Those who stopped smoking had begun to feel so much better, that many of them stayed off the drug. And in six to eight weeks…all of their symptoms went away."
      - "This was true even of those who continued to smoke a pack or more of tobacco cigarettes a day."
      - "It became pretty clear from this simple 'experiment' that hash was behind all of the carbon-copy symptoms."
    - Page 72
      - Dr. Forest Tennent: "It (speaking of the hash that the soldiers were smoking) was five to 10 percent THC."
    - Page 73
      - Dr. Forest Tennent: "People tend to stop smoking pot when they get the ***medical facts*** about what the drug is doing to them."

- **Chapter 12, Marijuana's Effects on Having Babies**
  - Page 77
    - Peggy Mann: "With monkeys, the researcher is in full control of all factors. Furthermore, rhesus monkeys metabolize-or break down-the marijuana molecule in a way that's very similar to humans. And their reproductive systems are very similar to humans. For example the female endocrine system, including the cycling of hormones, is virtually indistinguishable between human and female rhesus monkeys…and rhesus monkeys have a 28-day menstrual cycle."
  - Page 78
    - Dr.Ethel Sassenrath-Primate Center at the University of California at Davis:

- "At the beginning the monkeys seemed disconcerted by "the high". For a creature in the wild, being stoned is not a good survival mechanism."

- Peggy Mann: "…in the case of newly drugged monkeys, after a period of short daily exposure to the drug, conception was delayed for 3 to 5 menstrual cycles-compared to the non-drugged monkeys who conceived normally (which means in rhesus terms, at the first or second encounter).
- Dr.Ethel Sassenrath: "Further, at the time of menstruation, the THC breeders showed a new phenomenon of prolonged vaginal bleeding-not followed by pregnancy.
- Peggy Mann: "This suggested a drug-related interference with implantation of the sperm, or early resorption of the embryo. (Resorption means that the fertilized and implanted egg disappears rather than developing.) After two or three months, when the THC breeders became used to the drug, their menstrual cycles returned to normal. This did not mean that their reproductive workings returned to normal. Far from it."
- Dr.Ethel Sassenrath: "All of the THC pregnancies had characteristics which put them in the category of high-risk pregnancies."

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  - Dr.Ethel Sassenrath: "We also found that the THC mothers behaved quite different toward their babies. They did not cuddle them, or run after them, or groom them in a normal way. And they shoved them off impatiently much sooner than non-drugged mothers did."
- Page 81
  - Peggy Mann:
    - "The 'reproductive loss'-as scientists term it-was 44 percent for the THC mothers, and 12 percent for the undrugged mothers." (related to the rhesus monkey studies)
    - "…the THC mothers birth loss occurred from a wide spectrum of causes: early spontaneous abortion, in utero fetal deaths, still-births, and infant death just after birth.
    - "…THC mothers had a 'significantly lower' body weigh gain than the control mothers. And the male offspring of the THC mothers had 'slight but significantly lower' birth weight than the male babies of the undrugged mothers."
    - "…the so-called 'THC babies' who had been exposed to the drug only through their mother's exposure to the THC equivalency dose of one joint a day."
  - Page 82
    - Peggy Mann:
    - "…there was a wide spectrum of subtle abnormalities among the THC babies. None of these abnormalities were found in the control babies or in any of the 80 rhesus babies from non-drugged mothers in the primate colony who had died during the same period of time."
    - "Furthermore, ***there was not one THC baby which did not have some subtle developmental abnormality in one or more system*** (nervous, cardiovascular, or urinary) and/or placental abnormality."
    - "In human studies, radioactively-tagged THC has been shown to accumulate in the placenta."
  - Page 83
    - Peggy Mann:
      - "But what of the babies of those mothers? They had been exposed to the drug not only through the placenta-route prior to birth, but through the milk route while they were nursing."
      - "They showed no physical abnormalities. The underweight male babies caught up in weight. However, they ***did*** show behavioral differences particularly when they were weaned from their mother and placed with "weanlings" their same age."
    - Dr.Ethel Sassenrath: "The differences were so noticeable that we'd often say to a University student, 'There's one baby in there who's been affected by drugs. Can you pick it out? Invariably they picked out the THC monkey."

- Page 84
  - Dr.Ethel Sassenrath:
    - "The THC babies had similarities to the hyperactive child. For example, they would race around the gage wildly. Normally baby monkeys really enjoy playing…But the THC babies were often so persistent and aggressive that it turned from playing to harassment to aggression."
    - "They would scream longer and louder than the other babies. They embrace harder and longer. All of them had some type of exaggerated behavioral qualities. They also seemed to have higher levels of irritability."
  - Peggy Mann: (citing Dr. Mari Golub's visual attention test results) "The average control baby looked at each slide for 2 seconds before turning away. But the THC babies stared at the slide for an average of 30 seconds."
  - Dr.Ethel Sassenrath: "A monkey living in the wild has to be able to case its environment quickly. This type of delayed reaction to visual stimuli can be suggestive of central nervous system impairment and minimal brain damage."
  - Peggy Mann:
    - "Perhaps the single most sobering fact concerning the subtle developmental effects and not-so-subtle behavioral effects was this: in Sassenrath's study the monkeys were exposed to only one of the 61 known cannabinoids in marijuana. Since researchers have shown that other of the cannabinoids are even more impairing to some organ systems than THC, the question must be asked: what might THC-***and the other 60 cannabinoids***-be doing to the developing fetus of the human pregnant woman who has used marijuana for several years and who smokes a joint a day during her pregnancy?"
    - "The Center (CDC) noted that the rate of increase in this abnormality (ventricular septal defect) paralleled rather surprisingly the growth of marijuana in use in different sections of the country."
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  - Peggy Mann: (discussing the human study by Dr. Peter Fried at Carlton University in Ottawa, Canada of the behavioral effect of infants of pot-smoking mothers)
    - "The babies born to women who had smoked less than one or two joints a week showed no behavioral effects. But infants of mothers who smoked more than that ***were*** affected, and these effects were distinctly does-related. The most marked effects were tremors and 'startles'."
    - "'This" said Fred, 'is a sign of the nervous system not coping as adequately as is normal. The babies also showed 'slow response to visual stimuli.' Children of heavy smokers (12 or more joints per week) also had a shrill, high-pitched catlike cry. 'This,' said Fred, 'may be a symptom of drug withdrawal. We hear the same kind of cry from infants born to mothers who are addicted to heroin.'"
- Page 86 – Important Key Point
  - Dr. Carol Grace Smith-a reproductive pharmacologist: "There is increasing evidence to indicate that the reproductive system may be more impaired by marijuana than any other system. The reproductive system is unique because it has so many different types of control mechanisms. The impairment is a subtle lifelong process. Only when we want to have a baby do we notice that the system has been damaged. It can be heartbreaking if you lose your chance of being a parent because you've been smoking so much pot."

- **Chapter 13, Marijuana's Effects on Sex and Reproduction: Male**
  - Page 87
    - Peggy Mann: Dr. Issidorides is one of Europe's most respected cell biologists. Unlike Sassenrath, she concentrated on males. Not monkeys, but humans. Indeed, she is the

only scientist in the world to have examined the sperm of long-term cannabis smokers under an electron microscope. Her subject used the drug daily for an average of 16 years."

- Dr. Marietta Issidorides: "Drug use is frowned upon in Greece. Less than one percent of Greek teenagers have ever used cannabis (compared to 60 percent of American teenagers). However, there is a group of men who live on the outskirts of the port of Piraeus, and hashish use has long been common among them. But, they did not 'do' other drugs. Consequently, they made excellent subjects for the cannabis study."

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  - Peggy Mann: "When the scientists examined the sperm under the electron microscope, she did not know which sperm had come from which men. After she'd look at thousands of sperm cells, the "code" was broken. Whereas most of the sperm from the controls were plump and healthy looking, the majority of those from the users looked abnormal. In varying degrees they were misshapen, with sparse content of essential proteins.
  - Dr. Marietta Issidorides: "This condition indicated inhibited sperm maturation and infertility."
  - Peggy Mann: Also the great majority of the hash smokers' sperm had a deformed cap, which presumably made it difficult to enter and fertilize an egg normally.
  - Dr. Marietta Issidorides: "This was the most prevalent abnormality."
  - Peggy Mann:
    - "The second most prevalent abnormality was incomplete condensation of the chromatin, which contains the genetic material."
    - "The third abnormality were sperm so immature that, said Issidorides, 'in the healthy male they would never be seen in the ejaculate.' They're incomplete. But in the hash smokers, some did emerge-indicating that cannabis affects the sperm maturity at many levels, releasing sperm which had no business being out of the testis. If such sperm did penetrate an egg, there probably would be a natural aborting because the sperm cell is not 'normal'."

  - Dr. Marietta Issidorides:
    - "And, don't forget, all of our subjects were pre-screened. We took only healthy men."
    - "And there were no teenagers in the study. What worries me most is this: There's a critical development time for each system in the body. If you should have an adverse drug effect during the critical period, the system can be maimed for life. This is not to say that 'things won't work', but they won't work as well as if they had not been impaired during critical development periods. Puberty is, of course, the critical time for sexual and reproductive development. I consider that a very worrying area indeed."
  - Peggy Mann: "How does the sperm study of hash-smoking men in Greece relate to chronic pot-smoking American teenagers? The hash had a THC potency of five or six percent. Street pot in the US averages two to three percent, with California-grown Sinsemilla coming in at five or six percent, or more."
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  - Peggy Mann: (comments regarding a "sperm study in New York City of 16 healthy young men, all in their twenties" by Dr. Wylie Hembree of Columbia Presbyterian Medical Center) "Results: during the pot-smoking period there was a 40 percent decrease in the number of sperm in each ejaculation, and a 20 percent decrease in the percentage of the mobility of sperm (the percent of sperm that move)."
  - Dr. Wylie Hembree: "The others just lie there."
  - Peggy Mann: "There was also a slight increase in the percentage of abnormal forms of sperm in the semen."
  - Dr. Wylie Hembree:
    - "…the lower the percentage of normal sperm. The more likely that the man will be infertile, since most abnormally shaped sperm do not fertilize eggs. My

concern is whether marijuana is altering the biosynthetic process of sperm production within the testes."

- "If something in marijuana, which may be THC or other cannabinoids, is, in fact, altering the process of sperm production then we are obliged to find out what the consequences of this alteration is upon fertility and the offspring."
- "It could produce abnormalities in the offspring."
- "Whatever we're going to find in the human-it's going to be subtle."

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  - Peggy Mann: (comments regarding a marijuana-mouse study by Dr. Susan Dalterio, a researcher at the University of Texas Medical School at San Antonio)
    - "She looked at testosterone levels in the testes of male fetus mice who'd been exposed to either THC or CBN (cannabinol). How had they been exposed? Through their mothers-who were injected with a tiny spec of the cannabinoid dissolved in sesame oil, the human equivalency dose of one or two joints a day, as computed by Dr. Rosenkrantz careful charts."
    - "Dalterio sacrificed the mothers mid-pregnancy. In the mice who'd been given THC, one out of seven of the 'pups' (baby mice) were dead. But all lived in the mothers who'd been given CBN and in the control mice."
    - "Then Dalterio examined the amount of testosterone (the male sex hormone) in the fetal mice. This was important because at certain times in the development of the normal mouse-or human-the testosterone level is extremely high. And one of these times is in the fetus. Indeed, if the fetal testosterone level is very low, males may be born looking and acting more like girls then boys." "She found that in both the THC mice and the CBN mice, there was a 'significant decrease in testosterone'."
    - "Another important testosterone highpoint in mice and in humans, is puberty. Dalterio injected pubertal mice with one ***dose*** of THC. Others got a dose of CBN (both the human equivalency of one to three joints.) Again, the testosterone level dropped sharply (Other…"
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  - Peggy Mann:
    - "…researchers have shown significant testosterone level drops in other types of animals, and in human pot-smokers.)"
    - "Then Dalterio came up with a unique finding. She gave on tiny drop of THC 'flavored' sesame oil to pregnant mice on the day before they were due to give birth, and for the first six days of nursing. The babies received THC only through their mother's one day pre-natal exposure, and through their milk. At birth they looked the same as the control mice. At age 21 days (about 8 to 10 years in human terms) they all still weighed in normally. Then at 30 days (puberty) she teamed up some of the males with a pre-adolescent female mouse. Each pair had its open plastic shoe box."
  - Dr. Dalterio: :When you introduce a normal male teenage mouse to a pre-adolescent female, it's like kiddie porn." The boys get all excited. But the THC and CBN male mice slunk off into the corner. They left the girls strictly alone. They were clearly under stress..."
  - Peggy Mann: "There were a number of 'THC male mice' which had not been sacrificed for examination of their adrenals and testes. And when they reached adulthood most of them became grossly overweight. Whereas a normal mouse of that age weighs 40 grams, ***they*** tipped the scale at 55 grams.
  - Dr. Dalterio: "They looked like mice we had castrated in other studies. What's more, they acted that way as well. Their sexual behavior was definitely affected. Half of the THC animals didn't mount at all. Most of the CBNs would start mounting. Then they'd just give up in the middle and go away. This is very unusual behavior for a mouse. In fact, I never saw this before in any animal. I was astounded. Something was the matter with them. Maybe their brain was giving messages that it wasn't that much fun after all."

- Peggy Mann:
  - "This time she (Dr. Dalterio) took 72 male mice, and divided them into three groups. One lot got a dose of THC, the next got CBN, and the third got CBD (which, like CBN, is non-psychoactive). Each mouse got the human equivalency amount of the cannabinoid found in one to three joints. (The controls got sesame oil only.)"
  - "Each mouse received 'his drug' three times a week for five weeks. After the first two weeks, they all got something else-a 'straight' female mouse (no drugs). Each lived with this lady for a week, and then were given a new one. This pairing continued up to four weeks after the cannabinoid treatment was stopped."
  - :First result: The fertility in the males was reduced by about 20 percent. Their female mates either did not conceive, or, if they did…"

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  - Peggy Mann: "…conceive, there was significant increase in prenatal and postnatal loss "the babies died before and after birth."
  - Dr. Dalterio:
    - "…the cannabinoids cause so much damage to the sperm that tit results in observable changes in their fertility and in damage to their offspring. Having a dead baby is, after all, pretty heavy damage."
    - We took out some of the testes of the males, and looked at their chromosomes. And they were abnormal. They did not separate normally. They changed places when they shouldn't have. Or they stuck together, forming rings. They're not supposed to form rings. They're supposed to go side by side."
  - Peggy Mann: "Those male babies which lived received no doses of anything. They'd been exposed to the drug only through their fathers. When they grew up they were mated with normal female mice. And over 25 percent of the THC and CBN ***sons*** never produced a normal pregnancy. There was always something severely wrong."
  - Dr. Dalterio: "We also examined the testes in these mice. They too showed chromosomal abnormalities-as bad as their father's had been!"
  - Peggy Mann: "So astonished was the scientist by these results that she repeated the study all over again-using hundreds of mice. And she got the same results. But the second time around something new was added: two of the sons had offspring with severe brain defects. What kind of defect? No skull."
  - Dr. Dalterio:
    - "The brain was just sitting there covered only by skin. One of these mice also has open spine and the intestines were on the outside of the body.
    - "In the thousands of fetuses I've examined in the last ten years, mice exposed to alcohol and other drugs, I've never seen this severe a brain defect before. And here I found two in week one-among mice who had been exposed to ***cannabinoids though only their grandfathers***."
    - "It certainly seems that cannabinoids are mutagenic-they can transmit abnormalities across generations."
  - Peggy Mann:
    - "Dr. Carol Grace Smith…was asked to do studies on marijuana, sex, and reproduction. The request came from fertility counselors who told Smith that many of their pot-smoking patients were having trouble getting pregnant. In a surprising number of cases when they gave up the drug, pregnancy occurred within short order."
    - "Dr. Carol Grace Smith also read reports of many marriages and sex counselors whose male patients had become so involved with marijuana that they no…"

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  - Peggy Mann:
    - "…longer cared about sex. As one 20 year-old put it: 'Who needs all that hassle when you can be more satisfied with a joint?' The therapists had found

that if their patients gave up marijuana completely, interest in sex started to return after a month or so,"

- (comments regarding research by Dr.Robert Kolodny of the Reproductive Biology Research Foundation of St. Louis) "the general trend was that with increasing use there were lower rates of sexual activity and a lower frequency of orgasm. A study of 1,238 male cannabis users in India had shown similar results."

- Dr. Carol Grace Smith: (commenting about the findings of a sex and reproductive system study done on rhesus monkeys)
  - "Most of our knowledge about reproductive function in all areas has come from studies with rhesus monkeys."
  - "We've suspected that teenagers (humans) may be particularly vulnerable to the effects of drugs because this is a very critical period in the development of their reproductive system. This is the time when the gonadotropins (sex hormones from the brain) which control the onset of sexual development, are beginning to be secreted. In boys this means, among other things, bodily changes; broader shoulders, narrow hips, muscles, beard, pubic hair, and so forth. There have been a few case reports in medical journals which indicate that heavy marijuana use may be retarding sexual development of teenage boys."

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  - Dr. Carol Grace Smith:
    - "One dose (the human equivalent of one or two joints) 'shuts down production' for as long as 24 hours. THC profoundly inhibits testosterone and other hormones which stimulate the sex organs, bringing them down to the level of a castrated animal. Of the drugs that we've studied, none has as potent and long-lasting effect on these hormones as THC."
  - Peggy Mann:
    - "Many THC-reproduction studies have been done on a variety of male research animals. All show clearly that marijuana smoke, or THC, or other single cannabinoids such as CBN (cannabinol) markedly decrease sperm count and motility and markedly increase the number of abnormal or deformed sperm."
    - Dr. Carol Grace Smith: "We don't know whether the effects on chronic pot-smoking teenagers might not produce permanent disruption of sexual development in males and females. This question has not yet been looked at by research scientists."
    - Peggy Mann: "Also, we don't know whether the reversibility factor holds true in term of long-term smokers."