

COURT OF APPEAL FOR ONTARIO

B E T W E E N:

HER MAJESTY THE QUEEN

Appellant

-and-

TERRANCE PARKER

Respondent

AFFIDAVIT OF JOHN P. MORGAN M.D.

I, JOHN P. MORGAN, Professor of Pharmacology, resident of the State of New York, **MAKE OATH AND SAY:**

1. I am a Professor in the Pharmacology Department at CUNY Medical School in New York City. I have studied cannabis and its effects for over 25 years. I regularly review clinical and scientific literature regarding cannabis use, cannabis toxicity, and the medicinal use of cannabis. I have co-written a book "Marijuana Myths, Marijuana Facts: A Review of the Scientific Evidence". I was called to give expert testimony in the spring of 1997 in *R. v. Clay* (1997), 9 C.R. (5th) 349 and in the fall of 1997 in *R. v. Parker* (1997), 12 C.R. (5th) 251. A copy of my *Curriculum Vitae* which outlines my professional and academic qualifications including a list of publications which focus upon the study of *cannabis sativa*, was filed as an exhibit in both cases and can be found in the *R. v. Parker* Appeal Book, Volume II at pages 429 to 440.

2. Since providing this evidence in 1997, numerous studies and reports have been published with respect to the medical harm and medical benefits pertaining to the use of *cannabis sativa*. I am writing this affidavit to provide an overview of these recent developments.

3. I have reviewed the recent literature concerning the pharmacological treatment of epilepsy. There have been no striking pharmacological advances since 1997. Indeed, the pharmacological approach to the treatment of epilepsy has remained virtually unchanged for over two decades. Mr. Parker is among the minority of sufferers who are clearly not fully responsive to conventional pharmacological treatment for his condition.

4. With respect to studies that have addressed medical use of marijuana and epilepsy, in November 1997, an influential report was released by the British Medical Association ("B.M.A.") entitled "Therapeutic Uses of Cannabis". It concluded that cannabinoids appear to be effective for a number of ailments including chronic pain, epilepsy, glaucoma, chronic spastic disorders, and as anti-nauseants. The report concluded that further research was needed in all these areas but that cannabinoids have a margin of safety superior to many conventional drugs. **Attached to this my affidavit as exhibit "A" is a true copy of the B.M.A. study.** A license was granted to Dr. Geoffrey Guy, president of GW Pharmaceuticals, to legally grow the first medicinal marijuana plants in Great Britain. The material obtained from this crop shall be used in studies to examine further the documented ability of cannabinoids to reduce muscle spasms and general spasticity for patients with multiple sclerosis. He obtained *cannabis sativa* seeds and cuttings from Dutch growers who documented for him that the plants produced would have known concentrations of the chief ingredient in marijuana THC, and its precursor cannabidiol (CBD).

5. The status of the CBD cannabinoid is of interest. Animal studies and a few human studies have indicated that CBD may be the therapeutically active cannabinoid, not THC, in epilepsy. These issues are discussed in detail in a United States Institute of Medicine Report (pp.170-173) referred to in paragraph 17 of this affidavit. Although necessary research is lacking, there are many that believe that a mixture of cannabinoids may be therapeutic in some medical subjects. This is one more reason why the availability of Marinol®, a synthetic mono-cannabinoid preparation does not answer the needs of medicinal marijuana patients. Marinol® contains THC dissolved in sesame oil and marketed in small capsules to be swallowed. Setting aside the issues discussed above, it is a problematic medicinal. It is poorly bioavailable. A recent study demonstrated that more than 50 percent of subjects swallowing a Marinol® capsule have no blood levels of THC in 4 hours. **Attached to this my affidavit as exhibit "B" is true copy of this recent Marinol® study.**

6. The idea expressed by Dr. Kallant in his earlier testimony in the Parker trial (trial transcript volume 4, page 34, line 26-page 35, line 12) that one could maintain steady blood levels of THC with oral Marinol® in epileptics has never been done and is almost certainly impossible. THC swallowed by mouth is passed through the liver and thoroughly broken down. Further, the amount delivered is extremely variable depending upon food consumption, hepatic blood flow and perhaps other variables. Although some THC is lost in the smoking of marijuana cigarettes, claims of 'poor' bioavailability are wrong. As set out in a study conducted by Ohlsson et. al., , experienced cigarette smokers can reach 40 percent absorption of THC- - compared to approximately 5 percent of THC in Marinol®. **Attached as "C" is a true copy of the Ohlsson study of smoking and delivery of THC.** I believe that all smokers of potent marijuana will display peak blood levels of THC in 15-20 minutes. Marinol® users will peak (if they show any THC) at 90 minutes.

7. With respect to recent studies of more general application, in October 1997, at the 22nd annual meeting of the meeting of The Society for Neuroscience, a symposium on Marijuana and Analgesia was convened. Five studies were presented. There was strong evidence that cannabinoids had direct diminishing effects on pain signals in living animals. Further, the impact on pain of cannabinoids was specifically blocked by cannabinoid receptor antagonists, but not opioid antagonists. In other words, this established a nexus between the cannabinoids and a unique pain modulation system. Evidence was also presented that the brain's own "cannabinoid", anandamide is analgesic even in peripheral tissues. **Attached to this my affidavit as exhibit "D" are true copies of the Society for Neuroscience study.**

8. The World Health Organization released a health perspective and research agenda for cannabis in 1997, which provided a review and summary of current knowledge about cannabis use and health effects. Although the report did identify some therapeutic uses of cannabis as an anti-emetic and as a food intake stimulant, it concentrated on the possible acute and chronic medical harm caused by cannabis usage. The harmful effects suspected include: selective impairment of cognitive functioning, psychomotor impairment, development of a cannabis dependence syndrome, exacerbation of schizophrenia, lung disease in chronic heavy smokers, and a reduction in fetal weight secondary to maternal use. The report concluded that more research was needed in most areas of cannabis toxicity as suspected medical harms have not been conclusively demonstrated in human population studies. The scientific papers developed as background for the W.H.O. Report have been recently published and often serve to clarify the summarized toxicity. For example, although lung disease in the form of bronchitis has been noted in very heavy marijuana smokers, there is strong evidence that the heavy cannabis smoker will not develop the crippling lung disease, emphysema, seen in heavy tobacco smokers. **Attached as exhibit "E" to this my affidavit is a true copy of the W.H.O. Report.**

9. The W.H.O. report is an executive summary of scientific papers by consultants commissioned by the W.H.O., and which papers formed the basis for the report. One of the technical papers reviewed the public health consequences of alcohol, tobacco and marijuana use. Wayne Hall, Robin Roon *et.al.* after extensive review concluded, “[o]n current patterns of use, cannabis appears to pose a much less serious public health problem than is currently posed by alcohol and tobacco in Western societies.” Neither this comparison nor the paper itself was mentioned in the W.H.O. report. It was published separately (not as a W.H.O. document) by the Canadian Addiction Research Foundation in 1999 in their compendium of all the background papers to the W.H.O. report. An article in the *New Scientist*, a respected general science news and commentary weekly magazine, documents through a series of interviews and “leaked” reports, that the comparison and report were suppressed by the W.H.O. as being impolitic and encouraging the “legalize marijuana” campaign. **Attached to this affidavit as exhibits “F” and “G” respectively is a copy of the New Scientist article and the Hall article.**

10. The French government, in a study commissioned by the French Health Minister presented in June 1998, found cannabis to be the least dangerous of all psychoactive drugs. The study analyzed various licit and illicit drugs with respect to information about psychological and physical dependence, neural and general toxicity and social hazards. Alcohol, heroin and cocaine were classed as the most dangerous. Tobacco, psychotropic drugs, tranquilizers and hallucinogens were placed in a second less harmful group. Marijuana was classified alone in a third category defined as having few dangers. While I have not read this study (it is 150 pages long and published in French) I have reviewed the summary of the study and a British newspaper article (The Independent on Sunday (“I.O.S.”)) that reviews the report. **Attached to this my affidavit as exhibits “H” and “I” respectively are true copies of the summary of the French Government study and the I.O.S. article.**

11. In a report published in July of 1998, scientists demonstrated that anandamide is released by the brain during cell damage and appears to diminish the response to pain. Researchers also found that blocking anandamide's access to receptors by giving a cannabinoid receptor antagonist increased the response to pain. All of this work adds credibility to earlier studies that marijuana (or THC) is analgesic. Further, the anandamide-cannabinoid system probably functions as a pain down-modulator under normal conditions in the absence of external cannabinoids. **Attached to this my affidavit as exhibit "J" is a true copy of the July 1998 Society for Neuroscience Report.**

12. In July of 1988, research appeared in The Proceedings of the National Academy of Science that both THC and CBD would protect animals from the cellular damage that results from administration of glutamate. Glutamate toxicity is widely believed to be the mechanism of brain cellular damage secondary to stroke. Both THC and CBD acted as antioxidants, protecting cells from damaging oxygen radicals generated by glutamate exposure. These U.S. studies cite earlier work in Israel, describing similar protection from glutamate toxicity by the use of a synthetic cannabinoid, dexanabinol. This compound has been used in early clinical trials in stroke patients in hopes of diminishing post-stroke brain cell damage. **Attached to this my affidavit as exhibit "K" are true copies of the National Academy of Science studies.**

13. With respect to driving impairment, in October 1998, researchers from the University of Adelaide examined the effects of cannabis use on automobile driving. Using a blood analysis of drugs in non-fatally injured South Australian drivers, they discovered that drivers having consumed marijuana were no more likely to have been responsible for the accident than those who had consumed no drug were. There was some evidence that cannabinoid positive drivers were less culpable than

drivers who consumed no drugs were. This finding, seen previously, could indicate that drivers 'high' on marijuana become more cautious and careful. Consumption of alcohol and benzodiazepines was associated with greater evidence of accident causation. **Attached to this my affidavit as exhibit "L" is a true copy of the University of Adelaide study.**

14. In November of 1998, *The Lancet*, a prestigious British medical journal, published a review on the adverse effects of cannabis. The article concluded that the most likely adverse effects are bronchial irritation, the risk of accidents while intoxicated, dependence, and possible cognitive impairment. This conclusion caused the editors of *The Lancet* to state that moderate cannabis use has little ill-effect on health and thus, governments have based their decisions about criminalization on considerations other than health risks. **Attached to this my affidavit as exhibit "M" is a true copy of *The Lancet* article and editorial.**

15. On December 31st, 1998, a New Zealand Parliamentary Health Committee determined that the moderate use of the drug posed few health hazards. The 10 member committee stated:

The negative mental health impacts of cannabis appear to have been overstated...Long-term heavy use...does not produce gross impairment of cognitive function...Moderate use of the drug does not seem to harm the majority of people who try it.

The committee chairman said that he hoped parliament would reconsider the illegal status of marijuana. **Attached as exhibit "N" to this my affidavit is a true copy of the New Zealand report.**

16. The U.S. Institute of Medicine ("I.O.M.") published a comprehensive report in March 1999 entitled "Marijuana and Medicine: Assessing the Science Base", which emphasized careful scientific analysis. The report concluded that smoking marijuana is a risk factor in the development of

respiratory disease and that a distinctive marijuana withdrawal syndrome has been identified, but it is mild and short-lived. The report made six specific recommendations:

- 1) Research should continue into the physiological effects of synthetic and plant-derived cannabinoids and the natural function of cannabinoid-like compounds found in the body. The research should include, but not be restricted to, effects caused by THC alone.
- 2) Clinical trials of cannabinoid drugs for symptom management should be conducted with the goal of developing rapid-onset, reliable and safe delivery systems.
- 3) Psychological effects of cannabinoids such as anxiety reduction and sedation, which can influence perceived medical benefits, should be evaluated in clinical trials.
- 4) Studies to define the individual health risks of smoking marijuana should be conducted, particularly among populations in which marijuana use is prevalent.
- 5) Clinical trials of marijuana use for medical purposes should be conducted in patients with conditions for which there is reasonable expectation of efficacy, and should collect data about efficacy. They should also be approved by institutional review boards.
- 6) Short-term use of smoked marijuana (less than six months) for patients with debilitating symptoms should meet several conditions, including the failure of approved medications to provide relief.

Attached to this my affidavit as exhibit "O" is a true copy of the I.O.M. Report.

17. Recommendation 6) is of great importance. Because the I.O.M. knows that development of new delivery devices will take years, it recommends the current use of smoked marijuana; albeit, under strict circumstances.

18. The most recent study on cognitive harm associated with marijuana was conducted by researchers from Johns Hopkins University and published in May 1999. The authors specifically analyzed cognitive decline in 1,318 persons under 65 years of age and whether any of that decline was associated with cannabis use. It was to a degree longitudinal. That is, subjects had undergone cognitive testing in 1981 and 1982. The report included the repeated application of the same testing 12-15 years later. There were no significant differences in cognitive decline between heavy users,

light users, and nonusers of cannabis. A few studies in recent years have reported some cognitive harm in small groups of heavy users compared (usually) to non-users. This study included more subjects and was longitudinal. **Attached to this my affidavit as exhibit "P" is a true copy of the Johns Hopkins study.**

19. A current study that has yet to issue findings is being conducted at the UCLA Drug Abuse Research Center. Dr. Donald Abrams seeks any evidence that marijuana use could modify the therapeutic effects of anti-AIDS drugs. It is being carried out because many AIDS patients are using marijuana to enhance their appetite.

21. In conclusion, the arguments regarding the medicinal use of marijuana are multidimensional. However, the essential elements of the controversy are resolved. The use of marijuana causes medicinal benefits in a number of diseases and conditions. The drug has a wide margin of safety, and its use and outcomes could be monitored by physicians and patients. The remaining arguments are not central to the question of efficacy and toxicity in individual patients. They concern issues of standardization, regulation, administration and distribution. They concern the possible emergence of unusual toxicities and the structuring of a continuing prohibition of marijuana use which is not medicinal. These are indeed important and difficult issues. But, in my view, there is no reason to arrest, prosecute and imprison sick people while they are resolved.

22. I make this affidavit in support of an application to introduce fresh evidence, and for no other improper purpose.

SWORN BEFORE ME)
At the City of)
In the)
This day)
Of August, 1999)

DR. JOHN P. MORGAN

Notary Public