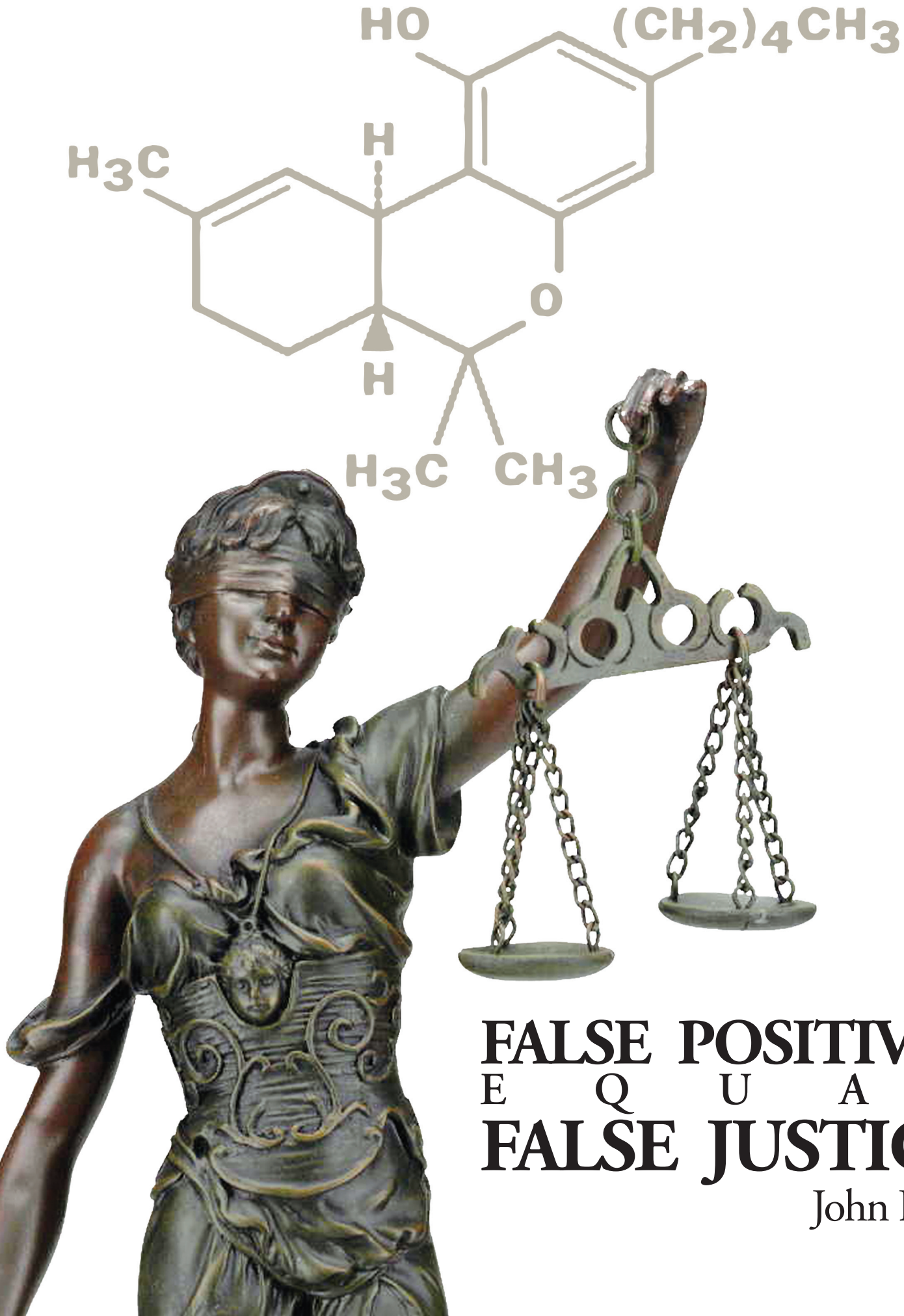
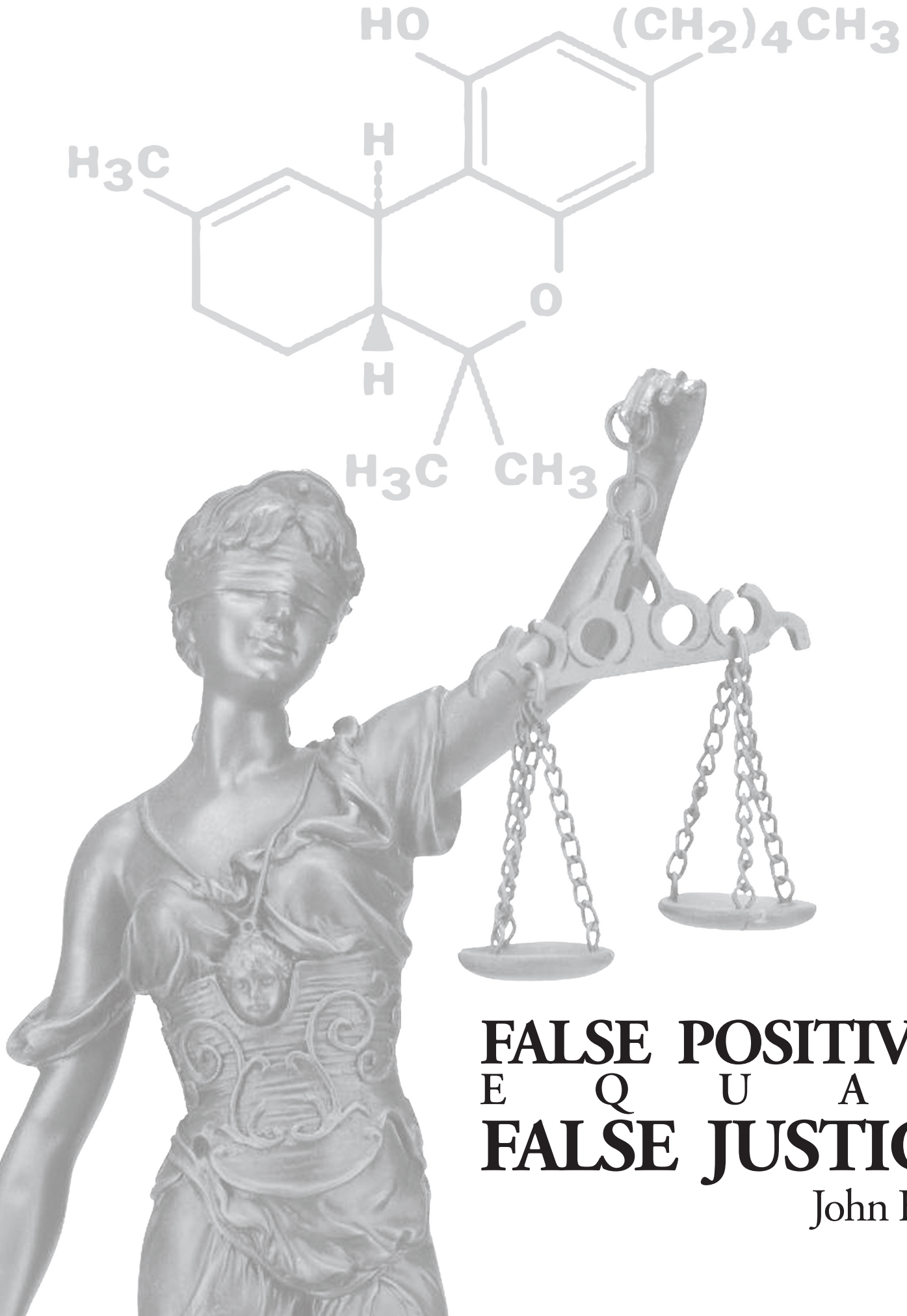


FALSE POSITIVES EQUAL FALSE JUSTICE

John Kelly



FALSE POSITIVES EQUAL FALSE JUSTICE

John Kelly

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EXECUTIVE SUMMARY

This two-year scientific/legal investigation reveals a drug testing regime of fraudulent forensics used by police, prosecutors, and judges which abrogates every American's Constitutional rights. The report is a call to action by former FBI chief scientist and narcotics officer, Dr. Frederic Whitehurst and writer and forensic drug expert, John Kelly, for lawmakers to enact a moratorium on the use of these tests and to create the necessary oversight and control of drug testing to protect the public's basic freedoms. While the report does not examine blood or urine drug tests, it does examine in depth lab tests as well as field tests used by police, jails, schools, border guards, parents and others to determine if a suspected substance is in fact an illegal drug.

Even before the attacks of September 11, 2001, there's been a decades-long rise in the security scrutiny Americans undergo ostensibly for our own good. We live in a society where the government does not trust the unsearched general public to sit in the same room with its leaders nor tell the truth about drug use. Unfortunate events have given rise to an unprecedented reliance on technology to prove true or false, safe or unsafe, rather than honest interaction as civilizations have relied on for centuries.

One only has to look at the decades-old War on Drugs to see how we've handed over personal privacy and reason to law enforcement in the name of reducing the perceived harmful impacts of drug use. Tragically, the extensive array of lab and field drug tests used today, while intended to aid the government in law enforcement, too often mislead police with false results that punish Americans with wrongful prosecutions and incarcerations.

Contained in this report are the results of experiments performed with field drug test kits that expose and document that they render false positives with legal substances. Based on the false positives, people continue to be wrongfully charged with, and prosecuted for, drug crimes. It is all too clear from the new research that there are numerous victims of false positives who have had a traumatic and costly experience that sometimes involves being held in jail for days, weeks or longer while waiting for more accurate confirmation tests to exonerate them. It is also revealed that the false positive based arrests can lead to costly lawsuits for local and state governments by outraged victims.

False Positives Equal False Justice documents that law enforcement officials, forensic drug analysts, and prosecutors knowingly employ the flawed Duquenois-Levine and KN Reagent tests as well as mere conclusory police reports to wrongfully prosecute and convict millions of individuals for anti-marijuana law violations. These wrongful prosecutions and convictions violate Supreme Court rulings, specifically *Jackson v. Virginia* and *Daubert v. Dow Merrell Pharmaceuticals, Inc.*, which prohibit the use of inaccurate, nonspecific tests and/or conclusory reports because they do not prove the presence of marijuana in a seized substance. In other words, millions of people have been, and continue to be, prosecuted and convicted of marijuana charges without proof that they possessed marijuana.

False Positive Equals False Justice is a siren alerting policy makers at all levels of government to end the use of field drug tests which have been proven to be unreliable. The former law enforcement officials, researchers, organizations and businesses that made this report possible must not have uncovered the truth in vain. It is imperative that law enforcement agencies take notice and voluntarily end the use of these flawed drug tests. The essential need of protecting the innocent must outweigh the convenience of a field drug test that only gives accurate information some of the time.

It is fortunate for us that the identification of marijuana has never been legally challenged. However, this situation may not last too long.

–UN Narcotics Report, 1961

The Duquenois test, the most widely used chemical test, is a somewhat enigmatic reaction whose mechanism is poorly understood.

–John Thornton and George Nakamura, 1972

We take judicial notice of the frightening rise of illicit drug use . . . in this country which is rapidly approaching epidemic proportions. However, we cannot allow this fact to result in a lessening of the state's requirements of proving each element of the crime beyond a reasonable doubt, for this requirement has long been a metaphysical cornerstone of our criminal law.

–Slettvet v. State, 280 N.E. 2d 806, 809 (Ind. 1972)

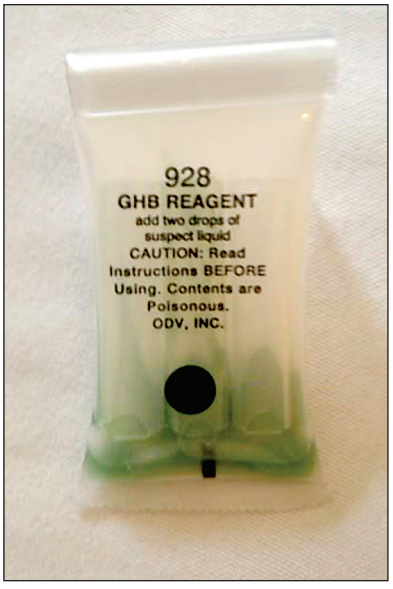
Prologue

Although the NIK NarcoPouch 908/Duquenois-Levine Reagent field test kit is the most widely used field test for identifying marijuana, there are no published studies as to its validity, reliability, or specificity, i.e., its capacity to render false positives. This is of particular concern because the company that produces the kit has written that: "The results of a single test may or may not yield a valid result. . . There is no existing chemical reagent test, adaptable to field use that will continually eliminate the occurrence of an occasional invalid test results [sic]. A complete forensic laboratory would be required to qualitatively identify an unknown suspect substance."[1] At the same time, the company claims that it has conducted and continues to conduct hundreds of validity and specificity studies but has not published any of these studies and, indeed, refuses to release this information.[2]

This in an unacceptable state of affairs from both a legal and scientific standpoint because millions of people have been arrested, prosecuted, and convicted of marijuana charges on the basis of the Duquenois-Levine (D-L) color chemical test, both with and without a microscopic exam. Under the Supreme Court decision known as *Daubert*, all drug tests must be valid which is to say they do what they claim they do. In this case, identify marijuana to the exclusion of all other drugs. Under the Supreme Court decision known as *Jackson*, all drug tests must be specific, i.e., they do not test positive for legal substances, if they are the sole basis for prosecution and conviction. In other words, if the D-L test is not specific, it cannot be the basis for a prosecution or conviction.

Introduction

On her way home for Christmas break in 2003, Bryn Mawr honor student, Janet Lee was arrested at the Philadelphia airport. Her checked luggage had three condoms filled with a white powder which the cobalt thiocyanate (C-T) test indicated was cocaine. Lee insisted that the condoms contained flour and were squeeze-toy stress relievers she used during exams. But her protests were in vain, and she spent the next three weeks in jail on drug charges that could bring up to 20 years in prison. Fortunately for her, a jail guard recognized her from volunteer work and contacted their volunteer group which obtained an attorney who demanded more extensive testing. These tests confirmed that the powder was flour. Two years later, Lee was awarded $180,000 by the city.



The NarcoPouch 928 GHB Reagent Test rendering a false positive after testing Dr. Bronner's Magic Soap.

The NarcoPouch 928 GHB Reagent Test rendering a negative result.

On April 4, 2007, Don Bolles, drummer for the punk band, *The Germs,* was arrested and jailed for three and a half days because the bottle of Dr. Bronner's Magic Soap found in his possession tested positive for the drug GHB. Police tested the soap at the scene using the NarcoPouch™ 928 field drug kit. Subsequent testing found that a wide variety of natural soaps as well as soy milk test positive for GHB.

The NIK Duquenois-Levine rendering a false positive after testing a chocolate bar.

On August 22, 2008, Ron Obadia and Nadine Artemis were arrested, handcuffed to a chair, and interrogated for hours at the Toronto Airport after their raw chocolate tested positive for hashish with the Duquenois-Levine color chemical test. They were placed in separate rooms and were told that they faced "life in prison" if they didn't confess. Each of them was also told that the other already had confessed. Subsequent lab testing proved there was no hashish in the chocolate. They were released but stuck with a $20,000 legal bill. They subsequently attempted to again travel to the U.S. on September 11, 2008. This time, Obadia was arrested by U.S. authorities and charged with possession of hashish after his raw chocolate tested positive with the Duquenois-Levine test. He was arrested and released and again after thousands in legal costs, he was totally exonerated.

In the Beginning

"Beginning in 1972," according to the *Journal of Criminal Defense,* "Bob Shapiro and James Shellow . . . made the 'chemical defense' famous. . . By insisting that forensic chemists conduct accurate and comprehensive analyses, Messrs. Shapiro and Shellow have wrought a revolution in forensic chemistry. The federal government and the states have had to free people on the basis of evidence that just a few years ago would have been sufficient grounds for conviction. Drug enforcement laboratories have had to go back to school to study chemistry. Defense lawyers have had to learn what the 'chemical defense' is and how to use it. In short, every courthouse in America, advertently or inadvertently, has been affected by the 'chemical defense'"[5]

The journal added that: "In the April, 1976 issue of *Microgram,* the Drug Enforcement Administration's official publication, a warning appears on the front page reminding forensic chemists always to distinguish between isomers of cocaine. The implication of this warning is clear: Messrs. Shapiro and Shellow have caused the D.E.A. to subscribe to drug analyses that are both rigorous and responsible."[6]

Proof that this revolution is dead came in 2007, when U.S. District Court Judge William Alsup declared *ex cathedra* that the combination botanical exam/Duquenois-Levine test for marijuana, the so-called Thornton/Nakamura protocol, and the cobalt thiocyanate (C-T) test for cocaine (Both of which are considered "no good" by Shapiro and Shellow.) were valid, confirmatory tests which had never rendered false positives.[7] The epitaph on the revolution's tombstone came on February 13, 2008 when U.S. Attorney Joseph P. Russoniello wrote U.S. District Judge Jeremy Fogel that: "The DEA does not have 'protocols' as such. The DEA does not have guidance set forth in one particular document type or "protocol" which provides, for example, detailed instruction on how one is to test methamphetamine using a particular instrument."[8] Russoniello also reported that the DEA conducts no independent, blind proficiency testing of its drug analysts, and in 2007, DEA labs analyzed 57,523 exhibits.

Ironically, it was in 1972, that the Thornton/Nakamura protocol for proving the presence of marijuana was established, laying the seeds for the quick demise of the chemical defense revolution at its birth. It is with the Thornton/Nakamura protocol, in particular the Duquenois-Levine (D-L) test that I begin as its history documents that millions of individuals have been, and continue to be, convicted of possessing and using marijuana without proof that they indeed possessed it.

As it enters its 70th year, the D-L test has yet to be validated despite being involved in the arrests, prosecutions, and convictions of millions of individuals. The handful of forensic studies done to demonstrate the accuracy and reliability of the D-L test and justify its use in cases are themselves invalid and seriously flawed. For instance, typi-

cal of forensic science articles on drug tests was a seemingly authoritative 2000 study funded by National Institute of Standards and Technology (NIST) and co-authored by Alim A. Fatah of the Office of Law Enforcement at NIST which claimed to have validated the D-L test. Indeed, the title of the article published in *Forensic Science International* was "Validation of twelve chemical spot tests for the detection of drugs of abuse."[10] To validate a drug test means to demonstrate that it is specific, i.e., the test identifies that specific drug to the exclusion of all other drugs. According to the authors themselves, they did not validate these 12 tests because they found they were non-specific, i.e., rendered false positives. "A positive CST (color spot test)," they wrote, "may indicate a specific drug or class of drugs is in the sample, but the tests are not always specific for a single drug or [class]"[11] The term "not always specific" – as well as "relatively specific" which was also used by the authors – is unscientific, illogical, deceptive, and indicates unreliability. How can a test be specific sometimes and not specific at other times? If it's not always specific, it's nonspecific which is what they found: "For example, cobalt thiocyanate (A.1) is used to detect cocaine. However, many other drugs will also react with this reagent and each analyte that tested positive with cobalt thiocyanate, produced a strong blue color (the same as cocaine)."[12] Speaking of the D-L test, they wrote that "mace, nutmeg and tea reacted with the modified Duquenois-Levine [test],"[13] i.e., produced false positives. It should be noted also that there are literally millions of compounds that were not checked to determine whether they rendered false positives with the D-L test. Moreover the authors ignored scientific articles which have reported more than a hundred substances which render false positives with the D-L test. This omission violated elementary scientific research and publication principles and requirements.

Even if they had somehow found the tests to be specific, it would have been meaningless because, as they admitted, the D-L test is subjective: "[A]ctual color [may] vary depending on [the] color discrimination of the analyst."[14] In other words, an analyst's or police officer's vision (including that of the authors) could cause a false positive or even a false negative. Without resolving this impediment to accuracy and objectivity, they should not have concluded the test was valid even as screen test. People are arrested and jailed on the basis of this test. By definition, subjective means unreliable. So the results of the D-L test are inadmissible as evidence under *Daubert*. The D-L test adversely affects the life, liberty, and pursuit of happiness of millions of individuals. This study is part of this adversity as it is cited by drug analysts, prosecutors, and judges in justifying its use and admitting its results as evidence. It was recently so cited in the *USA v Diaz* case in San Francisco which is a drug case involving the death penalty. Indeed, citing this and other invalid studies, U.S. District Judge William Alsup declared: "Despite the many hundreds of thousands of drug convictions in the criminal justice system in America, there has not been a single documented false-positive identification of marijuana or cocaine when the methods used by the SFPD Crime Lab (which include the D-L test) are applied by trained, competent analysts."[15] A few months before Alsup's declaration, the U.S. District Court for the Southern District of New York decreed that: "False positives – that is, inaccurate incriminating test results – are endemic to much of what passes as forensic science."[16] Even a manual that accompanies the D-L field kit states that: "There is no existing chemical reagent system, adaptable to field use that will completely eliminate the occurrence of an occasional invalid test result."[17]

The best known D-L "validation" study was published in 1972 by John Thornton and George Nakamura.[18] It instantly became the gold standard and protocol across the country for marijuana identification and still is. Like the NIST study, this report is internally contradictory, inconsistent, and scientifically flawed. On the front page of this article it states that the D-L test is a "confirmation" test "of marijuana."[19] By definition, confirmatory tests are valid and reliable; prove the presence of a drug beyond a reasonable doubt; and are specific, i.e., identify the drug to the exclusion of all other drugs and do not render false positives. They are also selective, i.e., do not render false negatives.

However, the imprecise, unscientific language and syntax of the article and its actual data contradict its conclusion that the D-L test is a confirmatory test. For instance, the authors wrote: "The occurrence of cystolithic hairs are an important criterion of the identification of marijuana leaf fragments. . . In any event, cystolithic hairs cannot be used as a sole criterion for marijuana identification. The Duquenois-Levine test is found to be useful in the confirmation of marijuana, since none of the 82 species possessing hairs similar to those found on marijuana yield a positive test."[20] The term "found to be useful" is imprecise and scientifically inadequate. The D-L test is either a confirmatory test or it is not. Vague imputations are unacceptable conclusions. This is especially true with these studies because

drug analysts look to these studies to assure that their tests are valid, and prosecutors cite these studies to convince judges to admit the results of these tests into evidence.

Even the sample of plants checked for cystolithic hairs and tested with the D-L test was woefully inadequate. The authors themselves wrote that there were more than 31,000 plants – actually there were at least 195,000 – which may have cystolithic hairs and test positive for marijuana. The authors also reported that there were two non-marijuana substances found to render false positives with the D-L test which the authors did not test. This means they did not prove specificity. Nonetheless, the authors claimed that the D-L test is specific: "The specificity of the Duquenois reaction has been established, empirically at least, over the past three decades (Ed. Note: No citations). No plant material other than marijuana has been found to give an identical reaction."[21] They added that: "The original Duquenois reaction was adopted as a preferential test by the League of Nations Sub-Committee on Cannabis (Duquenois, 1950). A modification of the test has been proposed by the United Nations Committee on Narcotics (1960) as a universal and specific test for marijuana. The modification referred to is the addition of chloroform to the final colored complex, a technique suggested by the U.S. Treasury Department Bureau of Narcotics (Butler, 1962). This modification of the test would seem to insure the specificity of the reaction, as the reactive phenolic materials other than the constituents of marijuana resin do not give colors soluble in chloroform. This has lead [sic] the UN Committee on Narcotics to conclude that there is nothing other than marijuana which will give exactly the same Duquenois reaction (Farmilo et al, 1962)."[22] All of these assertions have now been proven false.

As was the case with the NIST sponsored study, the article itself is invalid and cannot be legitimately cited by drug analysts or prosecutors because the D-L test is subjective since it depends on the color discrimination of the tester. This is the type of peer review that should have led the journal to reject the article. Subsequent to its publication, scores of substances were found to render false positives with the D-L test, and the UN declared that the D-L test was only a screening test and that the only valid test for marijuana and cocaine is gas chromatography/mass spectrometry (GC/MS). There has been no published response to this turn of events from Thornton, Nakamura, or anyone else in the forensic drug testing field.

The devastating effect of admitting conclusory reports and the results of nonspecific drug tests such as the D-L test as evidence has been eloquently enunciated by Professor Edward Imwinkelried. He wrote: "It is not only unnecessary for the courts to accept conclusory drug identifications based on nonspecific tests, it is also unwise for them to do so. The essence of the scientific method is formulating hypotheses and conducting experiments to verify or disprove the hypotheses. A proposition does not become a scientific fact merely because someone with impressive academic credentials asserts it is a fact. Testimony should not be treated as an expert, scientific opinion without a truly scientific basis, such as experimentation. Conclusory drug identification testimony is antithetical and offensive to the scientific tradition, and courts should not allow *ipse dixit* to masquerade as scientific testimony.

". . . It would eviscerate the *Jackson* standard to sustain a conclusory drug identification in the teeth of the judicially noticeable fact that every test used to identify the substance is nonspecific. Even more importantly, sustaining such drug identifications places a judicial imprimatur on testimony that cannot justifiably be labeled scientific. The rejection of such identifications is necessitated not only by due process but also by the simple demands of intellectual honesty. After *Jackson*, sustaining conclusory, nonspecific drug identification evidence is both bad science and bad law."[23]

USA v. Diaz

A glaring example of intellectual dishonesty and a judicial imprimatur on bad science and bad law was U.S. District Court Judge William Alsup's admission into evidence of the results of the D-L test in the on-going *U.S. v. Diaz* case in San Francisco. Section 702 of the Federal Rules of Evidence assigns to district courts the role of gatekeeper and charges the courts with assuring that expert testimony and forensic tests rest on a reliable foundation and are relevant to the task at hand. (*USA v Hermanek,* 289 F. 3d 1076 [9th Cir. 2002])

In *Daubert v. Merrell Dow Pharmaceuticals, Inc,* (509 U.S. 579, 593-94 [1993]), the Supreme Court created a flexible, factor-base approach to analyzing the reliability and validity of forensic tests and expert testimony. These factors include: (1) whether a method can or has been tested; (2) the known or potential rate of error; (3) whether the meth-

ods have been subjected to peer review; (4) whether there are standards controlling the technique's operation; and, (5) the general acceptance of the method within the relevant community.

The Supreme Court further explained that a district court has "considerable leeway in deciding in a particular case how to go about determining whether expert testimony is reliable." (*Kumho Tire v. Carmichael,* 525 U.S. 137, 152 [1999]). Alsup's interpretations, analyses, and rulings in the case of *USA v Diaz* demonstrate that this "leeway" is an open sesame, a recipe for disaster, error, and injustice. Regarding marijuana, Alsup wrote that: "Together, cystolithic hairs and clothing hairs were botanical features unique to marijuana."[24] This is patently false. If it were true, i.e., that certain hairs were unique to marijuana, this would be the only test necessary for confirming the presence of marijuana. In a study, cited by Alsup himself, George Nakamura reported 82 plants resembling marijuana with cystolithic hairs[25]. Even using the presence of cystolithic hairs as a screening test, one has to show the presence of calcium carbonate deposits, or they are not cystolithic hairs. Again, this was pointed out as a requirement by Nakamura's study. The SFPD crime lab does not perform this simple test, yet Alsup ruled that it did not matter. The lab's analysts could simply report that they saw cystolithic hairs, and this would suffice as valid evidence useable as such at trial.

The D-L test suffers from additional deficiencies not addressed by Alsup. For instance, the sequence of colors observed in the D-L test is also used by some forensic analysts to help "identify" marijuana. In 1950, Duquenois completed a United Nations study in which he noted, "The reaction is very specific if one considers the succession of tints. . ."[26] However, it was subsequently noted in another UN study that "the speed of the reaction was so great that it was usually impossible to observe the gradual changes of color described by the authors of the test (green to grey to indigo to violet). It should be mentioned that in some types of Cannabis the initial color was found to be pink instead of green."[27] The authors of this report observed that: "It is probably fortunate for us that the identification of marijuana has never been legally challenged. However this situation may not last too long."[28]

Several studies have found that the observed colors and intensities of the D-L test are time dependent and that using a fixed time longer or shorter than twenty minutes to observe the test results increased the number of false positives with non-marijuana substances. The SFPD lab protocols state that the analyst should start noting the color development "about 10 seconds after adding the Duquenois reagent and concentrated hydrochloric acid."[29] In other words, the lab consciously employs an inaccurate, unreliable version of the test.

Another study, provided to Alsup, concluded that: "The microscopic and Duquenois-Levine chemical test should be used as a screening method only."[30] Judge Alsup failed to mention many articles showing that the marijuana identification tests used by the SFPD lab are unreliable and invalid even though most of these articles were provided to him by defense attorneys. Perhaps the most comprehensive deconstruction of the combination D-L/botanical examination test prescribed by George Nakamura and cited by Alsup was the article "Winning Strategies for Defense of Marijuana Cases: Chemical and Botanical Issues" by Marc G. Kurzman, Dwight S. Fullerton, and Michael O. McGuire in the *Journal of Criminal Defense.*[31]

Kurtzman et al wrote that:

"It is usually concluded by forensic analysts that the microscopic test, combined with the Duquenois-Levine color test, is therefore specific for marijuana. Applying the four criteria discussed before … we clearly see that specificity has not been established.

" 1. The plant sampling used by Nakamura was not representative of all flowering plants... Second, Nakamura considered only the dicots, and not the monocots (some of which are commonly mixed in samples of presumed marijuana) including at least 50,000 species.

2. The Duquenois Levine color test has subsequently been shown to be quite non-specific.

3. Nakamura cautions the analyst to depend 'not only on the presence of cystolith hairs, but on its association with the ... nonglandular hairs ... and if present, the fruits and hulls, the glandular hairs and the flowering tops ...' These additional features have never been proven to be specific for marijuana nor claimed to be by Nakamura. For example, it has been reported that many plants have glandular hairs 'which, particularly if they are crushed and fragment-

ed may be confused with the glandular hairs of marijuana. Included among these plants are lavender, oregano, and other members of the Labiatae (mint) family and tobacco, all of which are commonly misidentified as marijuana.'

4. … If… one takes the time to learn which plant families have cystolith hairs, stalking glandular hairs, and sessile hairs … the results are remarkable. Families cited as having species with cystolith hairs, 24; with sessile hairs-glands, 80; with all three hair types, 13; with filament hairs, 18. Families cited by Nakamura as having species with cystoliths specifically resembling those of Cannabis, 13; the number of those families also containing species with stalked glandular hairs, 11"[32]

As Kurtzman et al noted: "For purposes of discussion, let's assume that we could eliminate 99% of all the 200,000-500,000 flowering plants by using marijuana screening tests, including gross observation of the fragmented plant. That still leaves 2,000-5,000 different plant species which could pass."[33]

Kurtzman et al concluded that "the Duquenois-Levine color test is not specific for marijuana, and if it is to be used at all, it should be used with a specific time limit and with a visible spectrophotometer to reduce the number of non-Cannabis samples giving positive tests."[34] The SFPD lab does neither.

The SFPD lab botanical exam only seeks to confirm the presence of the cystholithic and clothing hairs. It does not look for flowering tops, fruits or hulls. Nor does it test the presumed cystolithic hairs for calcium carbonate which Nakamura wrote was essential. Thus, even by Nakamura's standards, the SFPD test falls short. Judge Alsup stated several times that the cystolithic hairs are "unique" to marijuana which is why the botanical exam is a valid, confirmatory test just by itself. Nakamura himself pointed out that the cystolithic hairs are not unique to marijuana which is why the botanical exam is inadequate, certainly by itself. No one has ever published that cystolithic hairs are unique to marijuana.

Dr. Frederic Whitehurst analyzed the Thornton/Nakamura protocol in 2008. He wrote that "[I]n papers published in 1969 and 1972, George Nakamura proposed an analytical protocol or procedure for identifying marijuana that is widely used in forensic labs to this day. Nakamura, whose 1972 paper was co-authored by John Thornton, proposed a botanical examination in combination with the Duquenois-Levine reagent test to confirm the presence of marijuana.

"Since marijuana is a dicotyledon, Nakamura first microscopically examined 600 species of dicotyledons from which he identified 82 which had the so-called "bear claw" and "clothing" cystolith hairs of marijuana. He then subjected each of these samples to the Duquenois-Levine chemical test, and only the marijuana sample tested positive for marijuana.

"This was okay as far as it went, but it didn't go nearly far enough because there were about 199,400 dicotyledons which Nakamura did not examine or test. As he he noted: 'Representative species that bear cystolith hairs or hairs accompanied by independent calcified growth in the leaf, most of which are similar in structure to those of Cannabis, are listed below. No attempt was made to prepare a comprehensive listing because of the sheer magnitude of the task of examining 31,874 dicotyledons. (It has since been discovered that there are some 200,000 dicotyledons)."[35]

This means there are almost 200,000 dicotyledons which may have cystolith hairs and may test positive for marijuana. So his experiment cannot be considered a validation of the protocol. Further undermining the validity of the proffered protocol was Nakamura's remark that "[M]icroscopic identification of marijuana, therefore, depends upon not only the presence of cystolith but on its association with the clothing, or nonglandular hairs, on the other side of the leaf, and, if present, the fruits and their hulls, the glandular hairs, and the flowering tops as set forth in the U.S. Treasury Manual."[36]

As Whitehurst observed: "Nakamura's dependence upon not only the cystolithic hairs but also 'if present, the fruits and their hulls, the glandular hairs and the flowering tops' is troubling to the analyst who is left with a choice of a protocol without clear parameters. Do we need to see the fruits, their hulls, the glandular hairs and flowering tops or can we simply stop with the crystolithic hairs?. . .

"When we identify marijuana, we declare that the features we see, the data we collect, is unique to marijuana to the exclusion of all other plants. Can we say that today?

"Can a law enforcement officer without any training, experience or education in at least botany, not to mention the taxonomic features of plants, say that what he is seeing in the evidence he has just seized is marijuana to the exclusion of all other plants? Can the forensic lab examiner after having detected the presence of bear claws as well as clothing hairs on leaf surfaces and then subjecting the material to the Duquenois-Levine test say that those tests uniquely identify marijuana to the exclusion of all other plants?

"The obvious answer is 'no,' yet this is what happens daily in the United States ultimately resulting in tens of thousands of convictions."[37]

Whitehurst concluded that: "As Kurzman's paper was written in 1975, it would seem that the use of the hairs on marijuana leaves and the purple alchemy of the D-L test would have long since been successfully challenged and would no longer be useful as evidence in courts of law. In some jurisdictions, identification is even carried out by law enforcement officers with no more than visual, not microscopic, analysis and suspected marijuana is never even sent to a crime lab.

"A review of the scientific literature concerning the identification of marijuana utilizing the microscopic analysis of crystolithic hairs on the top and bottom of alleged marijuana leaves as well as the chemical test known as the D-L test reveals that we have no idea how likely are the observed results if the samples did or did not have a common source. There has not been enough basic research nor has the protocol been properly validated. The Kurzman mystery here is simply how is it that this protocol is still being utilized to decide whether human being should be confined to cages and, at times, to death chambers?"[38]

As explained in *Fitness for Purposes of Mass Spectrometric Methods of Substance Identification*: "Moreover, it must be realized that a 'positive' confirmation test thus obtained is not an unambiguous identification of Y (unknown substance). It only shows that the test result is not against the presumptions. Other substances may be able to give results that are the same or indistinguishable from those of Y. Therefore, unambiguous identification of Y is achieved if all other (relevant) substances can be excluded, so that Y remains the only possible candidate [even] if one focuses only on those that have some relevance to the field of analysis [data] on thousands of substances per field is necessary."[39]

Moreover, Nakamura's testing methods were different from and more extensive than the SFPD lab's marijuana tests, and thus do not speak directly to the validity or reliability of the SFPD lab's methods and tests. For example, Nakamura tested for the presence of calcium carbonate in the hairs of samples since it is present in marijuana leaves. As noted, the SFPD lab does not even test for calcium carbonate in its suspected marijuana evidence. Nakamura also employed photomacrography to measure and compare the sizes of marijuana hairs. The SFPD lab seldom uses photo comparisons or any measurement techniques.

The authors of the Kurzman article, one of whom was Dr. Dwight Fullerton, then-assistant Professor of Medicinal Chemistry at the College of Pharmacy, University of Minnesota, go on to review the many findings of false positives with the D-L test and conclude that "the Duquenois-Levine color test is not specific for marijuana, and if it is to be used at all, it should be used with a specified time limitation and with a visible spectrophotometer to reduce the number of non-Cannabis samples giving positive tests."[40]

The inadequacy of the D-L test has been noted by Armaki and his co-authors, "the unsatisfactory color tests [named] Beam, Duquenois, and Chamrawy ... lack in adequate specificity..."[41] Turk and his co-workers also reported that "the presently used colorimetric tests respond to a variety of vegetable extracts and to certain pure substances (i.e. false positives)."[42] R.N. Smith found that 12 of 40 plant oils and extracts gave a positive D-L test.[43]

M.J. de Flaubert Maunder further questioned the reliability of the D-L test *per se* by stating that it depended on the subjective judgment of the analyst. "[A] positive test," he wrote, "is not recorded until this color (pink/mauve) has been identified, and because it is almost impossible to describe in absolute terms it is best recognized by experience, as are the color transitions in the acid solution."[44]

A chemical identification test should be independent of the experience or judgment of the analyst as long as the analyst knows how to correctly carry out the test and follow the protocol. Otherwise, a second analyst could not necessarily replicate the procedures and findings of the first analyst.

Maunder further reported a number of substances which "gave a red to blue chloroform solution which, without careful observation of the speed and sequence of color development after the addition of the acid, may be difficult to distinguish from the cannabis color. None of these materials gave precisely the same color behavior as fresh cannabis, but most could not be readily distinguished from the reaction with old, or trace amounts, of cannabis."[45]

Maunder found another difficulty with the D-L test when the suspected substance is powdery or sticky. He reported that in this case, one will get a false positive for marijuana, if they do not use two thicknesses of absorbent paper and sufficient petroleum ether (PE) to moisten the lower paper and apply the test to the lower paper. "If the PE solution is not filtered in this manner," he wrote, "most powders will leave enough residue on the paper to give sufficient water soluble material for a false positive."[46]

Even with the use of two papers, Maunder found that agrimony and henna could give false positives. About agrimony he wrote that "although the color developed on the paper is a paler hue, it could be mistaken for that given by cannabis." Similarly, the color sequences with henna "are not easily distinguishable from cannabis and the chloroform layer is the correct pink color" indicating marijuana.[47]

While Maunder claimed that the D-L test provided "adequate confirmation" for the presence of marijuana, his own findings indicated that it is at best, a presumptive or screening test. Of the 240 substances he tested, 25 tested positive for marijuana, i.e. false positives. This means the D-L test is non-specific to marijuana and is not a confirmatory test. Maunder himself cautioned that the test "should never be relied upon as the only positive evidence," and elsewhere recommended the use of gas liquid chromatography and thin layer chromatography.[48]

C.G. Pitt, R.W. Hemdron, and R.S. Hsia determined that the D-L test "is chemically based primarily on the presence of 1,3-dioxybenzene (resorcinol) partial structure."[49] In other words, the D-L test will be positive for many resorcinols – commonly occurring plant substances and also found in common drug products.

For example, Pitt et al found that *Sucrets* (which contain a resorcinol) give a violet coloration for the test. Pinosylvin (from pine wood) and equol (from horse urine) "are other examples of resorcinols which contain at least part of the structural features required for a positive Duquenois test."[50] They also tested a number of common monocyclic resorcinols and icyclic resorcinols (chromanols) and found them to give a positive D-L test.

"In conclusion," wrote Pitt, "it is believed that if the criteria for a positive Duquenois test are rigorously adhered to, and botanical evidence is not available, the ubiquitousness of phenols in nature and their diversity in structure makes it mandatory to supplement the colorimetric test with chromatographic evidence. This conclusion is substantiated by the recent report that certain commercial brands of coffee give a positive Duquenois-Levine test."[51] Pitt added that the D-L test is useful as a "screen" test but not sufficiently selective to be relied upon for "identification."[52]

Unequal Justice under the Law

At least four court decisions disagreed with Alsup's ruling that the combination botanical/D-L test is a valid confirmatory test for marijuana. In 1973, a court in Wisconsin ruled that: "An expert opinion that the substance is probably marijuana (based on microscopic examination, D-L test and a thin-layer chromatograph) is not sufficient to meet the burden of proving the identity of the substance beyond a reasonable doubt."[53] Similar rulings were decreed in 1974 in two courts in Minnesota and in Missouri.[54]

As noted, in *Daubert v. Merrell Dow Pharmaceuticals, Inc,* the Supreme Court created a flexible, factor-base approach for analyzing the reliability and validity of forensic tests and expert testimony. These factors include: (1) whether a method can or has been tested; (2) the known or potential rate of error; (3) whether the methods have been subjected to peer review; (4) whether there are standards controlling the technique's operation; and, (5) the general acceptance of the method within the relevant community. The SFPD lab does not test or validate its methods; does not establish error rates; does not subject its methods to peer review; and, does not exercise controls or standards in its

drug testing. Moreover, the five tests in question here have not been validated as confirmatory tests in the field in general i.e., the tests have not been shown to reliably identify either cocaine or marijuana.. In short, there is no evidence that the hypotheses the SFPD lab is relying upon have been adequately tested by themselves or documented validation studies.

The Scientific Working Group for the Analysis of Seized Drugs also stipulates that: "When a category A technique (instrumentation such as mass spectrometry) is not used, then at least three different validated methods shall be employed . . . Two of the methods shall be based on uncorrelated techniques from Category B (includes thin layer chromatography and for cannabis only, macroscopic examination and microscopic examination . . . A minimum of two separate samplings should be used in these three tests … All Category B techniques shall have reviewable data . . . Cannabis exhibits tend to have characteristics that are visually recognizable. Macroscopic and microscopic examinations will be considered, exceptionally, as uncorrelated techniques from Category B when observations include documented details of botanical features . . . Examples of reviewable data are . . . recording of detailed descriptions of morphological characteristics of cannabis only . . . Laboratories shall have documented policies establishing protocols for technical and administrative review . . .

"Method validation is required to demonstrate that methods are suitable for their intended purpose. For qualitative analysis, the parameters that need to be checked are selectivity, limit of detection and reproducibility . . . Minimum acceptability criteria should be described along with means for demonstrating compliance. Valid documentation is required. Laboratories adopting methods validated elsewhere should verify these methods and establish their own limits of detection and reproducibility."[55]

The *Standard Practice for Quality Assurance of Laboratories Performing Seized-Drug Analysis* of the American Society of Testing Materials stipulates that: "Analysts shall take measures to be assured that identifications are correct and relate to the right submission. This is best established by the use of a least two appropriate techniques based on different principles and two independent samplings. Documentation must contain sufficient information to allow a peer to evaluate the notes and interpret data."[56]

According to the United Nations Division of Narcotics Drugs *Recommended Methods for Testing Cannabis*: "When possible, three entirely different techniques should be used, for example, color test and any two of the available chromatography techniques (TLC, GLC, or HPLC). The analysis of cannabis represents a special problem to the forensic chemist."[57]

According to the UN's *Recommended Guidelines for Quality Assurance and Good Laboratory Practices*: "Before an analytical procedure can be used to analyze submitted specimens, it must be fully validated in terms of sensitivity (limits of detection), specificity (freedom from interferences), and reproducibility (ability to provide consistent results)…. Before a specimen can be reported positive for one or more drugs of abuse, it should be subjected to two independent tests using separate aliquots of the specimen. If feasible, the two tests should involve different analytical techniques. Specific criteria for what constitutes a positive test should be established and clearly stated in the SOP manual. The criteria should include requirements for acceptable results and quality control samples. Also, before any specimen can be reported positive, the test results should be thoroughly reviewed by at least two individuals who are familiar with the analytical methods. The review should include examination of the test results, acceptability of all quality control results, proper and complete documentation of sample handling (chain of custody), correct calculation of quantitative measurements and absence of clerical error . . . undeclared or 'blind' proficiency testing (is recommended)."[58]

The UN's *Rapid Testing Methods of Drugs of Abuse* adds that: "Colors formed by the test reagents should be compared with a color reference chart if possible because color evaluation by individuals is a subjective judgment and can lead to misinterpretation of results."[59] The Scientific Working Group for the Analysis of Seized Drugs' Quality Assurance/Validation of Analytical Methods agrees with the UN on this point: "Since the results of color tests are detected visually, care must be taken that the analyst be thoroughly tested for the visual ability to detect very slight color changes."[60]

Several court rulings have denied the admissibility of forensic evidence and expert testimony for lack of adherence to the requirements for scientific reliability and validity. In *United States v. Monterio* (407 F. Supp. 2d 351, 373-374, D. Mass. 2006), the court ruled that even if the general methodology of toolmark identification passes muster under Daubert, the testimony of an expert must still be excluded under Rule 702 if witness has not complied with the documentation and peer review standards of his own profession. The court further found that the examiner's case note of a "positive ID" was insufficient documentation because the examiner "did not make any sketches or take any photographs."

In *United States v. Green* (405 F. Supp. 2d 104, 120, D. Mass. 2006), the court ruled that a firearm examiner's testimony was excluded under Rule 702 and Daubert in part because "the absence of notes and photographs in the initial examination make it difficult, if not impossible, for another expert to reproduce what [the government's expert] did…. Reproducibility is an essential component of scientific reliability." In *Ramirez v. State* (810 So. 2d 836, 847, Fla. 2001) a toolmark examiner's testimony was ruled inadmissible because "there is no objective criterion that must be met, there are no photographs, no comparison of methodology to review and the final deduction is in the eyes of the beholder, i.e., the identification is a match because the witness says it is a match." In *People v. Gomez* (596 P. 2d 1192, Colo. 1979) a trial court excluded color and microcrystal drug test results because duplicative testing consumed the sample (preventing reproduction by the defense expert) and the analyst took no photographs of the color or microcrystal tests.

The SFPD's lab's drug testing lacks documentation of microscopic or other testing results; fails to conduct or document any reliability or validity testing; fails to follow proper protocol with respect to color tests; lacks peer review; allows for no independent review or replication; and, conducts no blind proficiency testing. Therefore, the SFPD's lab's drug testing techniques and expert testimony based on the application of their techniques are scientifically deficient and do not fulfill the *Daubert* requirements for reliability and validity and admissible evidence. Their specific protocols and tests must be able to uniquely identify cocaine and marijuana to the exclusion of all other substances. But the many flaws in their protocols and the absence of adequate validation supporting them means the testability requirement of *Daubert* has not been satisfied.

Reviewability and reproducibility are at the heart of verification and the scientific method. Regarding the Supreme Court's ruling in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, the Ninth Circuit court declared that: "Something doesn't become 'scientific knowledge' just because it's uttered by a scientist nor can an expert's self-serving assertions that his conclusions were 'derived by the scientific method' be deemed conclusive, else the Supreme Court's opinion could have ended with footnote 2. As we read the Supreme Court's teaching in Daubert, therefore, though we are largely untrained in science and certainly no match for any of the witnesses whose testimony we are reviewing, it is our responsibility to determine whether those experts' proposed testimony amounts to 'scientific knowledge,' constitutes 'good science,' and was 'derived by the scientific method.'"[61]

Judge Kozinski's Ninth Circuit opinion regarding *Daubert* noted that a gate keeping court must decide in part whether " '… scientists have derived their findings through the scientific method or whether their testimony is based on scientifically valid principles….' (*Daubert*, 43F. 3d at 1316) In its gate keeping role, the court should view reliability as follows: 'This means that the expert's bald assurance of validity is not enough. Rather, the party presenting the expert must show that the expert's findings are based on sound science, and this will require some objective, independent validation of the expert's methodology.'"[62]

According to the government's Scientific Working Group for the Analysis of Seized Drugs (SWGDRUG), for independent reviewability and validation: "Documentation shall contain sufficient information to allow a peer to evaluate case notes and interpret the data…. Analytical documentation should include procedures, standards, blanks, observations, test results, and supporting documentation including charts, graphs, and spectra generated during an analysis."[63]

Defense experts in the *Diaz* case testified that the specific methodology employed by the SFPD lab could not be peer reviewed or reproduced because the lab's protocols are too vague to show what was actually done and the conclusory and cryptic lab notes and reports did not fill the gaps in any way. In short, there was no way to verify the

SFPD's lab's findings, and the scientific validity of the subsequent testimony was based solely on the word of the SFPD's lab witness which is unacceptable under *Daubert*.

Moreover, in this case, there were no files to review. They were all destroyed, along with the drugs, the testing results, and the lab notes. Inexplicably, the lab's narcotics SOP still allows for the identification of drugs without the use of GC/MS. That methodology cannot be established as reliable under *Daubert* or Rule 702 and should have been excluded from evidence.

According to a ruling in *Paoli R.R. Yard PCB Litigation*, (35 F. 3d 717,745 [3d Circuit 1994]): "[A]ny step that renders the analysis unreliable …. Renders the expert's testimony inadmissible. This is true whether this step completely changes a reliable methodology or merely misapplies that methodology." The lack of reviewability, such as was incurred in the *Diaz* case, rendered it impossible to tell whether what might otherwise be a reliable methodology and test was misapplied. Thus, the prosecution's expert's testimony on marijuana should have been prohibited by Judge Alsup.

Scientific requirements and recent court rulings disagree that these tests do not need specificity and exclusivity, and that the tester's experience makes their results admissible. A test's validity and reliability have to be able to stand alone, independent of the experience of the analyst, and the analyst's experience cannot add or subtract from its validity and acceptability as admissible evidence. As the Supreme Court recently declared: "Since *Daubert* . . . parties relying on expert evidence have had notice of the exacting standards of reliability such evidence must meet." (*Weisgram v. Marley Co.*, 528 US 440,455; 120 S. Ct. 1011, 1021; 145 L. Ed. 2d. 958 (2000))

In 1999, the Seventh Circuit Court ruled that: "A supremely qualified expert cannot waltz into the courtroom and render opinions unless those opinions are reliable and relevant under the test set forth by the Supreme Court in Daubert." (*Clark v. Takata Corp.* 192 F. 3d 750, 759n. 5 [7th Cir. 1999)

Also in 1999, the Justice Court of New York ruled that: "A marijuana field test is sufficient in the bringing of a charge, but more than the results of such a test even coupled with an experienced officer's identification of the drug, are necessary to sustain a conviction."[64] The court also referenced a 1998 opinion regarding the experience of the tester: "In *Angel*, the Court essentially reiterated its findings in *Swamp*. It once more noted the legal sufficiency of a field test in the bringing of a charge, but held that more than the mere results of such a test (even coupled with an experienced officer's identification of the drug as in *Angel*) would be necessary to find guilt, even in a Family JD (juvenile delinquency) fact-finding hearing. . . . In the instant case, the *People* argue that the testimony simply as to the field test results, particularly when coupled with the officer's identification experience and testimony, should nevertheless be sufficient enough to sustain a conviction under this section (of the law). . . . the court finds such evidence alone is insufficient for such purposes."[65] The court found the defendant not guilty

Another reason for not relying on a tester's experience was given by nine other courts and summarized by the Criminal Court of the City of New York: "Nonetheless, most lower courts which have considered the need for expert evidence in marijuana cases have held that a laboratory report must be filed to convert a complaint into an information . . . . Their rationale is, notwithstanding the police officer's averments in the complaints, that what they recovered is marijuana, a significant percentage of laboratory reports subsequently filed with the court do not support the officers' allegations."[66] In other words, experienced testers often produce inaccurate reports.

In 1978, the Supreme Court of Illinois reported that: "During the period March 1970 to March 1971, 1,674 samples of marijuana, morphologically identified as such, were submitted to the Wisconsin Crime Laboratory for confirmatory testing. Only 85.6 percent of these were in fact marijuana. Therefore, 14.4 percent, or one in every seven samples, turned in as suspected marijuana were not marijuana.' (Stein, Laessig, & Indriksons, An Evaluation of Drug Testing Procedures Used by Forensic Laboratories and the Qualifications of Their Analysts, 1973 *Wis. L. Rev.* 727, 770 (hereinafter Drug Testing Procedures). At the very least, these statistics demonstrate that even if it is possible, as Carrico claimed, to reliably identify cannabis in the manner he claimed to have used (feel, smell, sight and touch), such means are highly prone to error in the hands of anyone but an expert, because of the number of plants whose gross morphological characteristics closely resemble Cannabis sativa L." (*The People of the State of Illinois, Appellant,*

v. Peppe Park, Appellee, No. 49728, Supreme Court of Illinois, 72 Ill. 2d 203; 308 N.E. 2d 795; 1978 Ill. LEXIS 303; 20 Ill. Dec. 586/Filed May 26, 1978)

The Committee Note to the 2000 Amendments of Rule 702 expressly says that "[i]f the witness is relying solely or primarily on experience, then the witness must explain how that experience leads to the conclusion reached, why that experience is a sufficient basis for the opinion, and how that experience is reliably applied to the facts. The trial court's gatekeeping function requires more than simply 'taking the expert's word for it'."[67]

In 2004, the Eleventh Circuit Court found that: "Quite simply, under Rule 702, the reliability criterion remains a discrete, independent, and important requirement for admissibility . . . . If admissibility could be established merely by the *ipse dixit* of an admittedly qualified expert, the reliability prong would be, for all practical reasons, subsumed by the qualification prong." (*US v. Frazier* 387 F. 3d 1244 [11th Cir. 2004])

A court ruling in Alabama added that: "While the inquiry into 'reliable principles and methods' has been a familiar feature of admissibility analysis under *Daubert*, the new Rule 702 appears to require a trial judge to make an evaluation that delves more into the facts than was recommended in *Daubert*, including as the rule does an inquiry into the sufficiency of the testimony's basis ('the testimony is based on sufficient facts or data') and an inquiry into the application of the methodology to the facts ('the witness has applied the principles and methods reliably to the facts of the case') . . . . Neither of these two latter questions that are now mandatory under the new rule – the inquiries into the sufficiency of the testimony's basis and the reliability of the methodology's application – were expressly part of the formal admissibility analysis under *Daubert*." (*Rudd v. General Motors Corp.*, 127 F. Supp. 2d 1330 [M.D. Alabama 2001])

Recent cases show that the need for reviewability and reproducibility is not simply an academic concern. For some 40 years, the FBI lab employed unexamined the technique known as Comparative Bullet Lead Analysis (CBLA) to convict about 2,500 suspects of shooting crimes including murder. When CBLA's premises were finally checked, they were found to be false, and therefore CBLA was an invalid technique of no application to a suspect's guilt. In fact, an article in Science magazine in August 2005 reported that, with the exception of DNA identification, all forensic tests were unvalidated and testimonies based on these tests were a major cause of wrongful convictions.[68]

COCAINE/CRACK

A devastating piece of evidence proving the unreliability of both the SFPD's marijuana protocol and its cocaine protocol is that in May 1995, the American Society of Crime Laboratory Directors audited the lab after a SFPD narcotics examiner was caught on tape faking narcotics lab results. That audit states, in part,: "Although when used by properly trained and experienced examiners, crystal tests may be a valid method for confirmation of drugs, ASCLD/LAB no longer accepts crystal tests without instrumental confirmation as a basis for the identification of drugs. The laboratory standard of operating procedures manual are not used or understood by the laboratory staff and should be deleted until they are implemented. The laboratory should also review its current microscopic procedure for the identification of marijuana to ensure that it represents current generally accepted practice.

–Michael Burt 2007[69]

Alsup's interpretations and rulings regarding cocaine tests were equally erroneous. For instance, Alsup stated that E.G.C. Clarke's book, *Isolation and the Identification of Drugs*, (which San Francisco Police Department (SFPD) crime lab director James Mudge described as the "bible' of narcotics analysis) reported that microcrystalline tests are primary methods for the confirmation of the presence of cocaine. Nothing could be further from the truth. Clarke wrote, which Alsup actually quoted, that the microcrystalline test is "a means of final identification to confirm a provisional diagnosis made from chromatographic or spectrometric evidence," however, it is "unsuitable as a primary method of identification of an unknown substance."[70] In fact, microcrystalline tests *per se* are considered only presumptive or screening tests.

Alsup, who wrote erroneously elsewhere that GC/MS are "supplemental tests," twisted this passage of Clarke's book to conclude that: "This (Clarke's book passage) comports with the SFPD's procedure, however, which used

the cobalt thiocyanate color test as the primary or preliminary method of screening an 'unknown compound.' Microcrystalline tests were used for the final identification of suspected narcotics."[71] In other words, he equated a color screening test (which he admitted can give false positives) with a validated, instrumental test (GC/MS), to erroneously, illogically conclude that microcrystalline tests were valid confirmatory tests for cocaine. On this basis, he ruled that the results of such tests provided the basis for valid and reliable expert testimony and evidence for use at trial.

Alsup failed to mention that a 1995 audit of the SFPD crime lab, by the American Society of Crime Laboratory Directors (ASCLD), informed the lab that "ASCLD/LAB no longer accepts crystal tests without instrumental confirmation as a basis for the identification of drugs."[72] The lab did not conduct any instrumental confirmation in this case.

Alsup also failed to mention the conclusion of Clarke's passage that: "Final identification must depend on the comparison of the crystals formed from the unknown with those prepared from an authentic sample of the drug and the same reagent…the microcrystal test is of little use in the general search for an unknown drug."[73] Similarly, a UN study, also cited by Alsup and the SFPD lab as supporting its tests, stated that: "Standard cocaine should be analyzed concomitantly."bv Alsup also cited the *Standard Guide for Microcrystal Testing in the Forensic Analysis of Cocaine*, published by *ASTM International*, as supporting the SFPD's lab's use of microcrystal tests. The ASTM standard guide recommended the use of an "authenticated cocaine sample" and stated that: "The reagents utilized for the microcrystal tests are to be tested for reliability using an authenticated cocaine standard. Only when it is determined that the reagents are producing the expected response, may the reagents be used in this response."[75] (Alsup actually quoted this statement.)

The SFPD lab, admitted by Alsup, does not require its analysts to compare the crystals generated from suspected samples of cocaine with authentic samples of cocaine crystals. Nor does it test the reagents against known samples before each use which Alsup admitted "is recommended by the literature."[76] The SFPD lab only compares photos of the crystals. And even though he had a copy of the *UN Recommended Methods for Testing Cocaine*, he did not mention its conclusions that: "It must be stressed that positive results for color tests are only presumptive indications of the possible presence of cocaine. The color tests for cocaine are especially prone to produce false positives."[77] The UN publication added that: "The warning given for color and odor tests applies equally to the microcrystal test."[78]

Alsup was also provided copies of the passage of the *Mandatory Guidelines for Federal Workplace Drug Testing Programs* of the Department of Health and Human Services, Substance Abuse and Mental Health Services Administration which states that: "At this time gas chromatography/mass spectrometry (GC/MS) is the only authorized confirmation method for cocaine, marijuana, opiates, amphetamines, and phencyclidine."[79]

Judge Alsup and the SFPD lab referenced several articles which they claimed showed that the techniques used by the SFPD lab had been scientifically validated. One was Charles Fulton's article, *The Identification of Cocaine and Novocaine*.[80] This study involved only the testing of cocaine and novocaine. It did not determine whether other similar drugs would give false positives and was insufficient to satisfy the testing requirements of Daubert or the validation requirements of the forensic drug community.

Moreover, it is not at all clear that this study showed that cocaine crystals can be distinguished from novocaine crystals, let alone the "millions" (SFPD analyst Deborah Madden's testimony) of chemicals that exist. For instance, Fulton reported that "[i]f only a very small drop of reagent is added [to a sample of novocaine] with a stirring rod there is immediate crystallization in bushy feathered crystals, irregular plates, etc., the precipitate having considerable resemblance to that of cocaine."[81] In other words, novocaine gave a false positive. This is the platinic chloride crystallization test which the SFPD lab claims is a fail-safe method for positively identifying the presence of cocaine. In his decision, Alsup wrote that: "No other substance (other than cocaine) was known to create this result when platinic chloride was applied."[82] This study also reported that gold chloride added to cocaine would not cause crystals to form. The gold chloride test is a second crystallization test used by the SFPD lab to identify cocaine.

A second study, *Cocaine Diastereoisomers*, cited by Alsup, only conducted crystal testing on a few synthetically made (not street grade) samples of the cocaine diastereoisomers and could hardly qualify as a validation of the forensic

crystalline test. Moreover, the photograph at page 16 of the article, showing a gold chloride crystal of cocaine looks nothing like the photograph presented by the prosecution or the photograph of the gold chloride/cocaine crystal in the SFPD's Standard Operating Procedures manual which is used as a comparison standard by which the laboratory confirms a positive result.[83]

This article concludes that "[t]he principal disadvantages of this technique are that the presence of other compounds in the sample can distort the microcrystalline precipitate and that the technique requires a certain degree of expertise on the part of the chemist."[84] The SFPD lab's SOP does not provide for a procedure for removing other compounds or adulterants from suspected cocaine samples before applying the gold chloride crystallization test.

The third study cited by Alsup, *Further Studies on Spot Tests and Microcrystal Tests for the Identification of Cocaine*, concluded that: "To date we are not aware of any chemical that produces a false positive relative to cocaine provided that the correct set of tests is performed properly. Yet, the current list of chemicals is extensive, and not all of the chemicals have been compared to cocaine; also, new chemicals are continuously being synthesized. Further, because a number of variables discussed above could prevent an analyst from reaching an accurate conclusion, the use of a more analytical procedure should be considered."[85] Alsup and the lab claimed that more analytical procedures were not needed in the identification of cocaine by crystal tests.

This study also reported that: "Reaching an accurate conclusion using microcrystal tests will depend on the level of experience of the analyst the proper use of standards and controls, the presence of adulterants and/or diluent in the seized in the seized samples, the reaction pH, the temperature and humidity, and the concentration of the reagent and of the chemicals."[86] The SFPD lab's SOP does not specify procedures for dealing with adulterants or diluents (which could affect the crystallizations), nor does the SOP control for the temperature or humidity. SFPD crime lab analyst Deborah Madden testified that these variables were of no concern. She claimed that in her 30 years experience, she had not known of any situation where the temperature or humidity affected the formation of the crystals, and that the crystals created by positive gold chloride and platinic chloride microcrystal tests always looked the same.

During her testimony, Madden was shown a photograph of a gold chloride-cocaine crystal from an article which Alsup and the lab claimed supported the validity of the lab's cocaine tests. The picture looked different from the X-shaped crystals both Madden and director James Mudge had described as indicating cocaine as well as from the comparison photo in the lab's SOP manual. No explanation was provided for this discrepancy.

Alsup concluded that "to the extent the SFPD procedures fell short of the procedures recommended by the literature, the deficiencies were not sufficient to undermine their reliability for *Daubert* purposes."[87] Thus, he cited the scientific literature when it served his purposes only.

The *Daubert* decision required that Alsup consider the error rate of the cocaine tests. Alsup ruled that: "Thus, as to the chemistry itself, this order finds that the error rate of the procedures used by the SFPD Crime Lab to identify cocaine is close to zero."[88] Alsup provided no basis for his conclusion, and SFPD lab director James Mudge testified that there were no known error rates for the testing of cocaine with microcrystalline tests.[89]

District courts also accept results from cocaine field kits. The most widely used field test for cocaine and crack is the Scott test which is a three step color test, each step involving the addition of a certain reagent and observation of the color that consequently develops. In the first step, blue precipitates appear. In the second, these precipitates completely disappear. In the third step, blue appears again, but in the lower layer. Published reports suggest that diphenhydramine hydrochloride, chloropromazine, promazine hydrochloride, scopolamine, promethazine with phencyclidine, and a combination of phenycyclidine with either promazine, dibucaine, or methaprilene as well as other medicines and designer drugs give false positives with the Scott test which is also used to identify crack cocaine. It has also been shown that too much heroin or dibucaine also give false positives. In February 2004, three boys were arrested in this manner by police in Tokyo; ultimately it became clear that their substance was not cocaine but a legal drug.[90]

Charles Fulton points out in *Modern Microcrystal Tests for Drugs* that: "No color test for cocaine is known to the writer that is worth the trouble of making it. This even applies to the blue precipitate with cobalt thiocyanate (color

precipitation test), used by some for distinguishing cocaine from procaine or as indication of cocaine in the presence of procaine; too many other local anesthetics are now on the market besides these two."[91] Peter Baker and Geoffrey F. Phillips reported that: "Field tests are only for preliminary sorting. . . Winek and Eastly evaluated the (Scott test) and considered it useful for pure materials suspected of being cocaine, but found false positive reactions with some drug mixtures that did not contain cocaine. These authors recommended that confirmation of drug identity should always be sought by an alternative (chromatographic) technique . . . Basos and Hoffman, in a brief review of field testing, emphasized that all field tests should be confirmed in the laboratory, a point which the reviewers have emphasized."[92]

C.L. O'Neal et al reported that: "The actual color produced by the reagents for each drug may vary depending on many factors: the concentration of the drug, whether the drug is in salt or free base form, which salt form is present, any additional diluents or contaminants present in the sample, the color discrimination of the analyst and the conditions under which the test is preformed. . . For example, cobalt thiocyanate is used to detect cocaine. However, many other drugs will also react with this reagent and each analyte that tested positive with cobalt thiocyanante produced a strong blue color."[93]

In *Chemical Analysis, A Series of Monographs on Analytical Chemistry and its Applications*, edited by P. J. Elving, J.D. Winefordner, Volume 75, in the chapter entitled, "Spot Test Analysis" by Ervin Jungreis, the author tells us that the cobalt thiocyanate spot test indicates a positive reaction for: cocaine hydrochloride, codein phosphate, atropine, heroin, nicotine salicylate, opium, scopolamine hydrobromide, meperidine, methadone hydrochloride, methylphenidate hydrochloride, procaine hydrochloride, methapyrilene hydrochloride, and phenobarbital sodium.[94]

In the UN's *Rapid Testing Methods of Drugs of Abuse*, published in 1994, the following comments appear under field testing techniques for cocaine:

For the cobalt thiocyanate test: "A similar colour may occur in the presence of other controlled (methaqualone, phencyclidine) and non-controlled drugs/precursors."

"There are millions upon millions of other white crystalline materials which have not been ruled out as giving false positives with the cobalt thiocyanate test."

For the modified cobalt thiocyanate test (Scott Test): "Only a very few non-controlled or controlled drugs will give a similar colour sequence."[95]

J.D. Prall for one reported that diphenhy-dramine hydrochloride, chloropromazine hydrochloride, and other medicines showed the same color sequence as cocaine.[96] M. Ishiguro et al found the same false positive with promazine hydrochloride and scopolamine.[97] S.K.Lorch reported that promethazine alone or phencyclidine alone did not behave like cocaine in the test, but that mixing them together caused a false positive. Lorch also found that the combination of phencyclidine with either promazine, dibucaine, or methapyrilene showed a false positive.[98] F.W. Grant et al stated that tests for cocaine based on cobalt thiocyanante (used by the SFPD lab) showed an unacceptable incidence of false positives and false negatives.[99]

Another cause of false positives was sample size. Y. Tsumura et al reported that proper sample size is critical for correct decisions, since too much heroin or dibucaine showed exactly the same color sequence as cocaine and thus gave false positives, and too much cocaine showed persisting precipitates in the second step, yielding a false negative. The appropriate sample size was 1 mg or smaller. Only two mg of heroin or dibucaine gave false positives. On the other hand, 3 mg or more of cocaine gave a false negative. They also found that freebase (crack) cocaine could give false negatives even when the sample size was appropriate, and it could not be distinguished from a newer substance of abuse, 5-methoxy-N,N-disopropyltryptamine (5-MeO-DIPT, foxy).[100]

Tsumura also found four chemicals that show the same color sequence as crack cocaine: chloropromazine HCL, diphenhydramine HCL, 5-methoxy-N,N-disopropyltryptamine HCL (5-MeO-DIPT) and promethazine HCL. They reported that if the complete disappearance of precipitates at the second step was considered requisite for a cocaine-positive decision, a crack cocaine sample would give a false negative. On the other hand, if the persistence of precipi-

tate at the second step was not considered an obstacle to a positive decision, all four of the chemicals would give false positives.[101] Thus it became clear that the persisting precipitate is one cause of false decisions.

Finally, cocaine is sometimes mixed with various materials to increase its volume or for camouflage, and it was found that these materials may cause an incorrect decision in the Scott test. There are, of course, a number of problems with determining what blue means. First is whether the looker is color blind. Second is the inability of the human eye to resolve wavelengths of light. The blue reaction from the cobalt thiocyanate test with cocaine may give another color blue than that from another material, and yet the individual observing the blue may not be able to tell the difference in the colors.

JUDICIAL ANARCHY

Recently, Senator James Webb stated that "the criminal justice system as we understand it today is broken, unfair . . ."[102] Nowhere is this more apparent than in the disparate and contradictory court decisions regarding the admissibility of the results of the D-L and C-T tests. Not only have different courts contradicted themselves on admissibility but certain courts have admitted the results of the D-L test while ruling that it does not prove the presence of marijuana beyond a reasonable doubt. This is a real conundrum which needs exposure and unraveling as it translates into unequal justice under the law and a denial of due process not seen since the days of free states and slave states. It literally means that a person in one state can be convicted of possessing marijuana on the basis of the D-L test while a resident of another state cannot be convicted on the basis of the D-L test. This is nothing short of anarchy disguised as law and order. The Supreme Court of Illinois in *The People of the State of Illinois v. Pepe Park* illustrated this confused, unconstitutional reality. In denying the admission of ipse dixit reports, the court found "that police officers may not be presumed to possess the requisite expertise to identify a narcotic substance . . . because it simply is far too likely that a nonexpert would err in his conclusion on this matter, and taint the entire fact-finding process."[103] In this respect, the court cited a study that found 241 incorrect identifications of marijuana by arresting police officers. This study, said the court, demonstrated "that even if it is possible, as (deputy sheriff Billy) Carrico claimed, to reliably identify cannabis in the manner he claimed to have used (feel, smell, sight and touch) such means are highly prone to error in the hands of anyone but an expert, because of the number of plants whose gross morphological characteristics closely resemble Cannabis sativa L."[104]

In the same decision, the court erroneously claimed that "[T]o determine accurately that a particular substance contains cannabis, all that is necessary is a microscopic examination combined with the Duquenois-Levine test."[105]

On June 7, 1973, the Supreme Court of Wisconsin upheld the marijuana conviction of Jay Jacob Wind which was based on the D-L test even though "standing alone (the test) is not sufficient to meet the burden of proving the identity of the substance beyond a reasonable doubt. . . . If this were a possession case, the tests would be insufficient."[106]

The court admitted that: "It is quite true that the tests (botanical exam, D-L) used by Mr. Michael Rehburg, a chemist and witness for the prosecution, were not specific for marijuana. . . . He admitted, however, the tests he performed were merely functional group tests and could not distinguish between Cannabis Indica and Cannabis Sativa L.; but more important, that neither of these tests were specific for marijuana. . . . It is without dispute in this record that functional group tests used by Rehburg separate out compounds that belong to a homologous series but are not exclusive or specific for marijuana. See also: *ALI-ABA Course of Study on Defense of Drug Cases* (1970) and in particular the following articles which warn that chromatography and the Duquenois Test are not specific for marijuana: Oteri, Examination of Laboratory Experts 242; Sullivan, *Police Laboratory Testing Procedures 102*; Jatlow, *Identification and Analysis of Drugs 90* . . ."[107]

In 1977, the D.C. Court of Appeals ruled that: "At the close of the government's evidence, the defense did not move for judgment of acquittal but presented its witness, Dr. Sorrell Schwartz, a professor of pharmacology at the Georgetown University Medical Scholl with impressive credentials. He testified that all the tests performed by the government's analyst were screening tests and even in conjunction with one another could not specifically identify marijuana. . . .

"Dr. Schwartz recommended mass spectrometry as a relatively simple and inexpensive test which is specific; this test is not performed by the government presently. The government analyst agreed in his testimony that the Duquenois-Levine test is a screening test; he was not asked to characterize thin-layer chromatography. . . .

"Appellant's expert, with long experience in laboratory techniques, severely criticized the government's chemist for subjecting the substance to too short a period of microscopic examination and for allowing insufficient time for the chemical tests to develop. Appellant's expert stated in conclusion that the techniques used by the government expert would have been insufficient to have permitted positive identification of the substance in a scientific publication."dd

The Court of Appeals also noted that the trial judge had ruled that "I am not satisfied with his (prosecution's expert) testimony to support specific identification of the substance. . . ."[109]

In 1979, a trial judge in North Carolina blocked the conviction of C. Richard Tate by use of the D-L test. The trial judge found that the D-L test was "not specific for marijuana" and had "no scientific acceptance as a reliable and accurate means of identifying the controlled substance marijuana" and allowed the defendant to suppress use of the test results on that basis.[110] This finding was upheld by the North Carolina Court of Appeals as well as the North Carolina Supreme Court which found that: "The determination that the test used was not scientifically acceptable because it was not specific for marijuana was amply supported by the facts. . . The trial court's ruling that the results of the tests conducted on green vegetable matter by using the Duquenois-Levine color test in the Sirchie drug kit were inadmissible in evidence was supported by the court's findings that the test is not scientifically accepted, reliable or accurate and that the test is not specific for marijuana because it reportedly also gives a positive reaction for some brands of coffee and aspirin. . . . The conclusion to exclude the test results is amply supported by these findings of fact . . . and the test results were properly suppressed . . ."[111]

In 1989, the Criminal Court of New York ruled that: "In the documentation submitted by the *People* in support of their motion, the Duquenois-Levine test is described as an extremely reliable test for the presence of marijuana, developed in 1937, modified in 1962 and currently in wide use in forensic laboratories. The particular test kit used by Police Officer Rodelli has also been purchased by law enforcement agencies in nearly every State as well as the United States Armed Forces. . .

"Henry Mills, supervisor of drugs for the Division of Forensic Science, Georgia Bureau of Investigation, asserts that in his 19 years of laboratory experience he has 'not found a "false positive" – i.e., an instance where a substance was positive on the modified Duquenois-Levine color test but "negative" for marijuana after microscopic examination.' Susan Hart Johns, research and development program administrator for the Illinois State Police, claims a similar experience: in more than 2,000 laboratory tests, she did not have a "false-positive" (purple in the lower chloroform layer) when using the modified Duquenois-Levine test on leafy plant material. And a test conducted by the New York City Police Department as part of its officer training program was apparently to the same effect: in every 1 of 25 instances (19 non-marijuana substances and 6 marijuana samples), the field test gave the correct results. . .

"Finally the *People* point to a 1976 study by the Mid-Atlantic Regional Laboratory of the Drug Enforcement Administration, U.S. Department of Justice, which found the modified Duquenois-Levine test highly selective for marijuana and concluded that if the test is properly performed the 'possibility of a false positive becomes negligible.'(At 97.). . . . (Hughes and Warner, "A Study of 'False Positives' in the Chemical Identification of Marijuana" – Drug Enforcement Administration Laboratory Notes, *Microgram* Vol. IX, No. 7 (July 1976)."[112]

"In this case," continued the court, "the *People's* affidavits and submissions represent ample proof that the Duquenois-Levine test is generally accepted as reliable by experts in the field, including those in the Federal Government. This court's own research has also found confirmatory reports of the test's reliability. (See, Fochtman, Winek, "A Note on the Duquenois-Levine Test for Marijuana," 4 *Clinical Toxicology* 287 [1971]; Moenssens, Moses and Inbau, Scientific Evidence in Criminal Cases op.cit.) Defendant has not cited any contrary findings. Moreover, appellate courts from other jurisdictions have affirmed the reliability of such field test procedures as sufficient to prove the identity of marijuana at trial. (*State v Hill,* 638 SW3d 827 [Tenn Crim App 1982]; accord, *State v Sadusky,* 54 Ohio Misc 49, 376 NE2d 1363 [Akron Mun Ct 1977]; *State v Shoultz,* 564 P2d 257 [Okla Crim App 1977];

Matter of Smith, Ohio Ct App, Mar. 31, 1982, docket No. 9-81-34)." (*The People of the State of New York v. Juan Escalera,* 143 Misc. 2d 779; 541 N. Y. s. 2d 707; 1989 N.Y. Misc.)[113]

Despite finding that the botanical exams and D-L tests were not valid confirmatory tests, the courts in Wisconsin and D.C. ruled that their results were admissible as scientific evidence because of the tester's experience. As the Wisconsin court ruled: "The test for marijuana need not be specific or exclusive to meet a scientific test of certitude. . . . we do not believe that the test need be specific for marijuana in order to be probative. An expert opinion that the substance is probably marijuana even if the test is not exclusive is probative and admissible. . . . The government chemist testified at trial that he had performed one microscopic and three chemical tests on the substance. These four tests led him to conclude that the material was 100% marijuana. This conclusion was given greater weight by the expert's extensive experience in marijuana identification."[114]

The Wisconsin Court of Appeals disagreed with Judge Alsup's finding that the cobalt thiocyanate color test is a valid confirmatory test for cocaine. The court reviewed a possession of cocaine conviction using the cobalt thiocyanate test. The circuit court trial judge, Dominic Amato, like Judge Alsup, stated that: "And the only thing I can lay upon the record is that with regard to this test, experts from the Crime Lab have indicated to this Court in other cases that these tests are highly accurate and they wouldn't be used the way we have been using them, and they wouldn't have been accepted all this period of time, but for the fact of their high, high degree of accuracy where a false positive is so remote that it deals with mere possibilities, [sic] and possibilities are, all of us in this room could win the Illinois lottery."[115]

The Appeals Court found that the cobalt thiocyanate test "is not specific for cocaine. It is also known as a nonspecific, presumptive, color screening test. . . . Nonspecific, presumptive screening tests for drugs such as the test employed in this case, may result in what are called false positives, i.e., false identification of cocaine when the substance is some other alkaloid. 'The Scott field test was designed to distinguish cocaine from other alkaloids, but is deficient in distinguishing cocaine from other drug mixtures such as lidocaine and PCP [phencyclidine].' . . .

"Eigenfield probably administered an accurate cobalt thiocyanate test, but because the test is nonspecific, and by his testimony he stated that the test is presumptive, the test results cannot meet the rigorous burden of proof beyond a reasonable doubt, since it is was not a scientifically specific test for cocaine. It could have been another drug. Thus, this court holds that the State failed to meet the burden of proof establishing the second element of the offense that Jackson was charged with, possession of a controlled substance – cocaine. . . .

"For the above stated reasons, the trial court abused its discretion in allowing into evidence the cobalt thiocyanate color screening test that is known to be nonspecific and presumptive as positive proof beyond a reasonable doubt that the substance seized was cocaine establishing Jackson's guilt for possession of a controlled substance – cocaine. . . . For these reasons, the trial court is ordered on remand to vacate the judgment of conviction and dismiss this matter."[116]

In its decision, the court articulated the array of problems with color tests. It noted that: "Examples of the intended use of color field tests such as the test used in this case, and their strengths and weaknesses are noted as follows:

"Although color change tests are both easy and fast to conduct, they have major weaknesses. To begin with, color change tests are nonspecific:

"If we assume that there are 20 distinguishable colors, then there are 8,000 possible responses in three-color tests and 160,000 possible responses in four-color tests. Statistically, 250 different compounds (out of 2,000,000) would give the same three-color tests and 12 would give the same four-color tests.

"Color tests are often used as field screening procedures in the interpretation of test results. One analyst might identify a color as a light red while another analyst would record the test result as a pink. There are techniques for dealing with this problem. Many manufacturers furnish color charts that can be placed next to the plate or tube for direct comparison. In addition, the Inter-Society Color Council-National Bureau of Standards (ISCC-NBS) has developed a set of color charts for the same purpose. Finally, the analyst can photograph the test results with high

quality color film. The production of the charts and photograph at trial enables the trier of fact to make a direct comparison and doublecheck the analyst's evaluation of the test result.

"In 1982, a United States Army forensic chemist had this to say of color field tests:

'Field tests were designed to assist law enforcement agencies in drug investigations. They are simple and quick procedures for testing materials suspected of containing drugs which help the agent determine if a substance requires additional analysis by forensic laboratory personnel. Field tests were never intended to be used as a positive method of drug identification.'

"He later stated in the same report:

'In summary, field tests are not confirmatory for drugs. They were never intended to be confirmatory nor should they be used as such in courts-martial or elimination boards. A laboratory analysis by a trained forensic chemist in [sic] required for positive identification of any drug. As a footnote, twenty to thirty percent of all substances initially field tested positive for a drug and subsequently submitted to this laboratory for analysis are devoid of any drugs or contain a drug different than the one indicated by the field test.'"[117]

The Supreme Court of the State of Illinois articulated how the use of invalid drug tests undermines the rule of law: "One of the chief safeguards of our liberty is the requirement that, before punishing an individual as a criminal, the executive branch of government must prove . . . that the individual has violated the laws . . . Any relaxation of this standard poses the gravest possible threat to our basic institutions. While we must also take care not to unnecessarily impede the State from dealing effectively with the vexatious problems of illegal drug traffic which plague our society, the requirement that the State provide more substantial evidence than it did here is but a minor burden."[118]

Thus we see that the law enforcement, forensic, and legal landscapes are fraught with arbitrariness and questionable practices as well as conflicting policies and court decisions as regards tests for controlled drugs and admissible evidence under the Supreme Court decisions of *Jackson* and *Daubert*. This is manifested in forensic falsehoods as well as directly contradictory judicial opinions and decisions across and within jurisdictions. The result is an unconstitutional lack of equal justice under the law for suspected and convicted drug offenders. In California, a defendant can be convicted for marijuana offenses on the basis of the D-L test; in North Carolina, he cannot be so convicted. At the same time, technological advances in the detection of illegal drugs are being largely ignored and unused in place of microcrystalline and chemical color tests that do not even employ colorimeters. This despite the fact that instrumental analyses are the accepted valid, reliable methods; whereas the validity of microcrystalline and chemical color tests have never been established. In the United States, where there were more than 872,720 marijuana arrests in 2007, the most widely used test is the Thornton/Nakamura protocol which is non-specific, non-selective, unreliable, and invalid. In San Francisco alone, some 12,000 people, who are arrested each year for suspected cocaine and crack offenses, have their seized evidence examined by a nonspecific, 4-minute microcrystalline test of unproven validity and reliability and capable of rendering false positives.

Despite their widespread use, the results of these two tests alone are inadmissible as evidence under *Jackson* and *Daubert* and cannot be legitimately used even for prosecution let alone conviction. Nonspecific, invalid tests cannot prove the presence of a controlled drug beyond a reasonable doubt as required by law.

In a 1983 law review article, Stephen G. Thompson observed that: "Modern criminal justice is premised upon the requirement that a criminal defendant be proved guilty beyond a reasonable doubt before punishment be meted out. The standard of proof is severe; its severity is based upon a collective societal judgment that the risk of error be borne by the state. As fundamental and unquestionable as this principle may seem, it is frequently tested when the interests of society appear urgent, immediate, and identifiable. In these instances, society often creates policies and systems which threaten the presumption of innocence."[119]

As a result of the perceived urgency of the Drug War, certain drug testing is a good example of the use of forensic evidence that in effect routinely deprives suspects and defendants of the presumption of innocence and results in wrongful prosecutions and convictions as well as unwarranted guilty pleas. The reason for this is that the most com-

monly used drug tests as now employed do not accurately reflect the true or actual identity of the evidentiary substance, i. e. they do not detect. They do not prove the presence of an illegal drug, certainly not beyond a reasonable doubt.

EPILOGUE

What the drugs themselves have not destroyed, the warfare against them has. And what once began, perhaps, as a battle against dangerous substances long ago transformed itself into a venal war on our underclass. Since declaring war on drugs . . . we've been demonizing our most desperate citizens, isolating and incarcerating them and otherwise denying them a role in the American collective. All to no purpose. The prison population doubles and doubles again; the drugs remain.

> – Ed Burns, Dennis Lehane, George Pelecanos, Richard Price, and David Simon, creators of the HBO series, *The Wire,* in an op-ed published in *Time Magazine,* March 5, 2008.

The Drug War is a one-way railroad, a railroading, a non-stop conveyor belt to instant criminality, warped lives, and prison, particularly for young African American males. What is not known is that greasing the rails and oiling the belt are drug tests that do not prove beyond a reasonable doubt the presence of illegal drugs. The stealth Weapon of Mass Destruction of the Drug War is the D-L test which has diminished the life, liberty, and happiness of millions for 70 years and continues to do so at a record pace. I say stealth because law enforcement officials, judges, prosecutors, and drug analysts have cast an invisibility cloak over the test and covered up its inaccuracy while acting as if it were flawless. As reported above, in December 2007, U.S. District Court Judge William Alsup, speaking of the D-L and other invalid drug tests, ruled in a case involving the death penalty that: "Despite the many hundreds of thousands of drug convictions in the criminal justice system in America, there has not been a single documented false-positive identification of marijuana or cocaine when the methods used by the SFPD Crime Lab are applied by trained, competent analysts."[120] For 70 years, the overwhelming majority of defense attorneys have swallowed this lie whole hog and never challenged the D-L test on behalf of their defendants.

According to The Sentencing Project, prior to the Drug War, African Americans were nearly twice as likely to be arrested for drug offenses as whites. For every 100,000 residents, there were 684 black arrests compared to 387 white arrests, producing a 77% higher rate for black arrests. Between 1980 - 2003, there were more than 31 million drug arrests in the U.S. and black drug arrests rose by 225%, compared to an increase of 70% in white drug arrests. By 2003, African Americans were arrested at a rate that was 238% higher than whites, i.e., African Americans were 3.4 times more likely to be arrested than whites for drug offenses.[121]

Between 1980-2003, black arrest rates increased by more than 500% in 11 large cities with Tucson recording a 1184% increase, nearly three times the growth in white drug arrest rates. In Milwaukee, black arrest rates for drugs had risen by 206% by 2003, while white rates declined by almost 67%. Similarly, drug arrest rates grew by 729% by 2003 while the white rate declined by 24%. Overall, in 21 cities, the black/white ratio of arrests more than doubled.[122]

There is no data indicating a greater use of drugs among African Americans than among whites. Data from the Substance Abuse and Mental Health Services Administration of the Departments of Health and Human Services documents that African Americans use drugs at a rate proportional to their share of the general population since they comprise 12% of the population and 12% of regular drug users.[123]

Again, according to The Sentencing Project, in 1980, the rate of drug arrests in the U.S. was 256 per 100,000, comprising 5.9% of all arrests. By 1990, this figure had nearly doubled to 11.1%, and currently, one of every eight arrests or 12.5% is for a drug offense. Between 1980 and today, the number of annual drug arrests increased by 218%, from 518,000 to more than 1.8 million. Overall, there have been more than 37 million arrests for a drug offense since 1970 of which 31 million have occurred since 1980.[124]

As of 2006, almost half of American adults have tried marijuana, and the number of people who use it regularly is about 15 million. Nearly 44% of all drug arrests are marijuana arrests, and approximately 830,000 people were arrested on marijuana charges in 2006, 90% merely for possession. This number increased by 15% over 2005. In 2007, 872,720 people were arrested on marijuana charges, 88% for mere possession.[125]

Approximately 82% of the growth in drug arrests has been for marijuana. The significance of this change for the racial composition of drug arrests is that marijuana offenses produce a smaller (though still disproportionate to drug use) proportion of African Americans than do cocaine or heroin. On average, during the late 1990s, slightly fewer than one-third of persons arrested for marijuana offenses were African American, while half of persons arrested for a heroin or cocaine offense were black. As The Sentencing Project pointed out: "Given the extreme variations in city-level drug arrests that we have observed, it is unlikely that changes in drug use or drug selling alone can account for this variation."[126]

Human Rights Watch has summarized the effects of the excessive and racially disproportionate targeting and imprisonment of drug offenders as follows:

- African Americans constituted 53.5% of all persons who entered prison because of a drug conviction
- Blacks were 10.1 times more likely than whites to enter prison for drug offenses
- A black man was 11.8 times more likely than a white man to enter prison for drug offenses
- A black woman was 4.8 times more likely than a white woman to enter prison for drug offenses.
- Among all African Americans entering prison, almost two out of five (38.2%) were convicted of drug offenses, compared to one in four whites (25.4%)[127]

In 2003, 59,535 adult African Americans entered prison with drug convictions in 34 states. There is no official data on the Drug War. Between 1974 and 2001, an estimated 2,166,000 blacks were incarcerated on all charges in state and federal prisons. Since the mid-1980s, the nations' drug problem has been perceived to be primarily an urban black problem, even though available data suggest there may be six times as many white drug offenders as black. According to the 2006 national household survey of drug use and health conducted by the U.S. Department of Health and Human Services, 5,553,800 whites reported using crack cocaine at least once in their lifetime as opposed to 1,537,000 blacks. For all races, 8,554,000 used crack cocaine at least once in their lifetime as opposed to an estimated 35,298,000 who have used powder cocaine, and an estimated 20,118,000 who have used stimulants.[128]

"Whether intended or not, a variety of seemingly "race neutral" policies have contributed to growing racial disparity. Due to the intersection of racially skewed policing and sentencing policies, the federal crack cocaine mandatory sentencing laws, for example, have produced highly disproportionate rates of incarceration for low-level offenses. Similarly, school zone drug laws produce severe racial effects due to housing patterns, whereby drug offenses committed near the urban areas that contain many communities of color are prosecuted more harshly than similar offenses in rural communities populated largely by whites."[129]

Since the 1970s, there has been a 500% rise in the number of people incarcerated in prisons and jails resulting in a total of 2.2 million prisoners, 900,000 of whom are African Americans. As of 2001, one in six black men had been incarcerated, and at the current rate, one in three black males born today can expect to spend time in prison. African Americans are incarcerated at nearly six (5.6 exactly) times the rate of whites. The national incarceration rate for whites is 412 per 100,000 residents, compared to 2,290 for African Americans. These figures indicate that 2.3% of all African Americans are incarcerated, compared to 0.4% of whites. One in nine (11.7%) black males between the ages of 25-29 are currently incarcerated in prison or jail. The black rate of incarceration ranges from a high of 4,710 per 100,000 (4.7% of the population) in South Dakota to a low of 851 (0.85% of the population) in Hawaii. Hawaii, at 851 per 100,000 population, maintains a rate 15% higher than the state with the highest rate for whites, Oklahoma, at 740 per 100,000 population. While more than 1% of African Americans in 49 states and the District of Columbia are incarcerated, there is not a single state with a rate of incarceration that high for whites.[130]

Since 1980, tens of millions of dollars, countless hours, and all manner of attempts have been expended opposing the Drug War but to little avail. Indeed, it gets worse. As seen in a recent e-mail from an attorney in North Carolina whose Supreme Court has ruled that their most commonly used test for marijuana is nonspecific and invalid: "I had a trial yesterday for simple possession of marijuana. The officer testified that he asked the defendant to stick out his tongue because through his training and experience people who smoked marijuana had a white pasty film on their tongues, and my client, of course, had this white film."

The North Carolina Supreme Court decision shows that law enforcement officials, prosecutors, and judges know the lab tests as well as the "white pasty film" test and its like are unacceptable and invalid, yet they continue to use them to wrongfully prosecute and convict. This is because there is an invisibility cloak around their actions vis-à-vis the public and an ignorance on the part of defense attorneys. This is why we propose to spotlight this situation, not only to rectify it, but as a novel attempt to affect the Drug War. Given the enormous dependence on these tests, a moratorium on their use would cause an uproar that would, in turn, force a renewed public debate, if not a comprehensive investigation, about the Drug War. Revelations about the injustice and unwarranted suffering caused by the Drug War, as well as the waste of national resources, can't help but begin to resolve this travesty of justice and human outrage.

Despite Supreme Court rulings that the results of nonspecific, unreliable, invalid drug tests cannot be used by the police and prosecutors, the vast majority of drug arrests and convictions are based on these invalid tests that do not prove the presence of marijuana beyond a reasonable doubt. The result is untold thousands of wrongful arrests and convictions. At the same time, these burgeoning arrests and convictions, while costing hundreds of millions, have not reduced the use of drugs one iota.

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Experiments Shed Light on the False Positives

In 2008 and 2009 Dr. Omar Bagasra and his assistant Krishna Addanki tested the specificity of the NIK Duquenois-Levine Reagent System and the NarcoPouch™ KN Reagent tests with 42 non-marijuana substances following the procedure prescribed by each manufacturer. The following chart depicts the substances and the results from each test.

1. Remove clip, insert suspect material into test pack, reseal with clip and tap gently to assure material falls to the bottom of pack.

2. With the printed side of test facing you, break ampoules from left to right. Break by squeezing the center of the ampoule with tips of thumb and forefinger.

3. Break left ampoule, agitate vigorously for at least one minute.

4. Break middle ampoule and agitate gently. A blue-violet or purple color will develop within a few seconds to a minute if marijuana is present. Allow sufficient time for the blue-violet or purple to develop, but do not allow it to become too dark.

5. As soon as the blue-violet or purple color develops, break the right ampoule. Tap the pouch once or twice and the blue-violet or purple color will be extracted into the lower layer. Upper layer color is unimportant.

6. The formation of the proper blue-violet or purple color and its extraction into the lower layer is a positive test for marijuana.

Patchouli, spearmint, and eucalyptus tested positive for marijuana; while lavender, cypress, and oregano (which previous studies showed produced false positives with the D-L test) gave inconclusive results. The conclusion is that the NIK NarcoPouch 908 test is a nonspecific test that can give false positives. It cannot, therefore, be legally used for the prosecution or conviction of an individual for violations of the anti-marijuana laws.

The National Institute of Justice under the Department of Justice has established the following standards for literature accompanying drug field test kits.

a) A statement that the kit is intended to be used for presumptive identification purposes only, and that all substances tested should be subjected to more definitive examination by qualified scientists in a properly equipped crime laboratory.

b) A statement that users of the kit should receive appropriate training in its use and should be taught that the reagents can give false-positive as well as false-negative results.

c) A discussion of the possibility of reagent and/or sample contamination and consequent misleading results.

d) A discussion of proper kit storage in buildings and vehicles.

Each reagent container shall have a label that either directly or by reference:

a) Identifies the reagent.

b) Identifies the drug or drugs it can detect.

c) Is prominently marked “Danger” where appropriate.

d) Gives a discard date where appropriate.[3]

Aside from identifying the drug it can detect, the NIK NarcoPouch 908 does not provide any of this information. The failure to identify the dangers of the chemicals in the NIK NarcoPouch 908 is of particular concern given the following precautions and descriptions of these chemicals by the NIJ.

Acetaldehyde – EXTREMELY FLAMMABLE, TOXIC. May cause cancer. May cause heritable genetic damage. Harmful by inhalation, in contact with skin, and if swallowed. May cause sensitization by inhalation and skin contact. Possible risk of harm to unborn child. Causes severe irritation. Lachrymator. Photosensitizer. Target organs:

kidneys, liver. May develop pressure. Keep away from sources of ignition. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection.

Vanillin – None.

Ethanol – FLAMMABLE. May irritate in body tissues. Use with adequate ventilation. Avoid breathing vapor. Do not get on eyes, skin, or clothing. Wash thoroughly after handling. Do not swallow or inhale. Wear suitable protective clothing and gloves.[4]

Hydrochloric acid – ACID, TOXIC, CORROSIVE. Liquid and mist cause severe burns to all body tissue. May be fatal if swallowed or inhaled. Inhalation may cause lung damage. Do not get on skin or clothing. Wash thoroughly after handling. Wear suitable protective clothing, gloves, and eye/face protection. Use only with adequate ventilation.

Chloroform – FLAMMABLE, TOXIC, POISON. Suspected cancer hazard. Exposure can cause damage to liver, kidneys, and central nervous system (CNS). Harmful if swallowed. Causes eye irritation. Harmful to skin and respiratory system. Toxic and corrosive gases are formed on contact with flames or hot glowing surfaces. Wear suitable protective clothing and gloves.

S. NO	PRODUCT	PICTURE	NARCOPOUCH™ KN REAGENT	NIK DUQUENOIS-LEVINE REAGENT SYSTEM
1	ORGANIC VANILLA EXTRACT FLAVORGANICS A1		POSITIVE REDDISH ORANGE PHOTO – A1	NEGATIVE
2	ORGANIC PEPPERMINT EXTRACT FLAVORGANICS A2		NEGATIVE PALE YELLOW PHOTO – A2	NEGATIVE
3	ORGANIC ANISE EXTRACT FLAVORGANICS A3		POSITIVE THICK RED PHOTO – A3	NEGATIVE
4	ORGANIC HAZELNUT EXTRACT FLAVORGANICS A4		NEGATIVE PALE YELLOW PHOTO – A4	NEGATIVE
5	ALCOHOL-FREE COFFEE FLAVOR FRONTIER A5		NEGATIVE DARK BLACK PHOTO – A5	NEGATIVE
6	ALCOHOL-FREE ANISE FLAVOR FRONTIER A6		NEGATIVE PALE WHITE PHOTO – A6	NEGATIVE

S. NO	PRODUCT	PICTURE	NARCOPOUCH™ KN REAGENT	NIK DUQUENOIS-LEVINE REAGENT SYSTEM
7	ALCOHOL-FREE MINT FLAVOR FRONTIER A7		NEGATIVE PALE WHITE PHOTO – A7	NEGATIVE
8	AGRIMONY FLOWER ESSENCES BACH A8		NEGATIVE PALE YELLOW PHOTO – A8	NEGATIVE
9	VINE FLOWER ESSENCES BACH A9		NEGATIVE PALE YELLOW PHOTO – A9	NEGATIVE
10	VINE FLOWER ESSENCES BACH A10		POSITIVE ORANGE PHOTO – A10	NEGATIVE
11	CHICORY FLOWER ESSENCES BACH A11		POSITIVE BRICK RED PHOTO – A11	NEGATIVE
12	CHICORY FLOWER ESSENCES BACH A12		POSITIVE RED PHOTO – A12	NEGATIVE

S. NO	PRODUCT	PICTURE	NARCOPOUCH™ KN REAGENT	NIK DUQUENOIS-LEVINE REAGENT SYSTEM
13	OLIVE FLOWER ESSENCES BACH A13		POSITIVE RED PHOTO – A13	NEGATIVE
14	CERTIFIED ORGANIC PEPPERMINT WYNDMERE A14		POSITIVE ORANGE PHOTO – A13	NEGATIVE
15	CERTIFIED ORGANIC PEPPERMINT WYNDMERE A15		POSITIVE RED PHOTO – A15	NEGATIVE
16	PATCHOULI SIMPLERS A16		POSITIVE DENSE BRICK RED PHOTO – A16	NEGATIVE
17	ROSE ABSOLUTE SIMPLERS A17		POSITIVE THICK RED PHOTO – A17	NEGATIVE
18	GINKGO ZAND GOLD LABEL BOTANICALS A18		POSITIVE BRICK RED PHOTO – A18	NEGATIVE

S. NO	PRODUCT	PICTURE	NARCOPOUCH™ KN REAGENT	NIK DUQUENOIS-LEVINE REAGENT SYSTEM
19	AMERICAN GINSENG GAIA HERBS B2		POSITIVE ORANGE PHOTO – B2	NEGATIVE
20	BAYBERRY NATURE'S ANSWER B3		NEGATIVE DARK BLUE PHOTO – B3	NEGATIVE
21	ST. JOHN'S WORT LEMON BALM ECLECTIC INSTITUTE B4		POSITIVE DARK RED PHOTO – B4	NEGATIVE
22	BERGAMOT ORGANICS B5		POSITIVE BRICK RED PHOTO – B5	NEGATIVE
23	EUCALYPTUS ORGANICS B6		POSITIVE ORANGE PHOTO – B6	NEGATIVE
24	PATCHOULI ORGANICS B7		POSITIVE BRICK RED PHOTO – B7	NEGATIVE

S. NO	PRODUCT	PICTURE	NARCOPOUCH™ KN REAGENT	NIK DUQUENOIS-LEVINE REAGENT SYSTEM
25	CINNAMON LEAF ORGANICS B8		POSITIVE BRICK RED PHOTO – B8	NEGATIVE
26	EUCALYPTUS ORGANICS B9		POSITIVE ORANGE PHOTO – B9	NEGATIVE
27	BASIL ORGANIC OSHADHI B10		POSITIVE ORANGE PHOTO – B10	NEGATIVE
28	CHAMOMILE ROMAN WYNDMERE B11		NEGATIVE CLOUDY WHITE PHOTO – B11	NEGATIVE
29	EUCALYPTUS ORGANICS B12		POSITIVE ORANGE PHOTO – B12	NEGATIVE
30	LEMON GRASS ORGANICS B13		POSITIVE CLOUDY ORANGE PHOTO – B13	NEGATIVE

S. NO	PRODUCT	PICTURE	NARCOPOUCH™ KN REAGENT	NIK DUQUENOIS-LEVINE REAGENT SYSTEM
31	LAVENDER WYNDMERE B14		POSITIVE CLOUDY ORANGE PHOTO – B14	INCONCLUSIVE
32	CLOVE BUD FRONTIER B15		POSITIVE RED PHOTO – B15	NEGATIVE
33	ORGANIC CYPRESS SIMPLERS B16		POSITIVE RED PHOTO – B16	POSITIVE
34	ORGANIC OREGANO SIMPLERS B17		POSITIVE DARK RED PHOTO – B17	INCONCLUSIVE
35	ORGANIC SPEARMINT SIMPLERS B18		POSITIVE ORANGE PHOTO – B16	INCONCLUSIVE
36	ORGANIC CLOVE SIMPLERS B19		POSITIVE BRICK RED PHOTO – B19	NEGATIVE

S. NO	PRODUCT	PICTURE	NARCOPOUCH™ KN REAGENT	NIK DUQUENOIS-LEVINE REAGENT SYSTEM
37	ORGANIC CINNAMON LEAF SIMPLERS B20		POSITIVE BRICK RED PHOTO – B20	NEGATIVE
38	ORGANIC PATCHOULI SIMPLERS B21		POSITIVE DENSE ORANGE PHOTO – B21	POSITIVE
39	GINGER OSHADHI B22		POSITIVE DENSE ORANGE PHOTO – B22	NEGATIVE
40	FRANKINCENSE OSHADHI B23		POSITIVE DENSE RED PHOTO – B23	NEGATIVE
41	EUCALYPTUS OSHADHI B24		POSITIVE DENSE ORANGE PHOTO – B24	POSITIVE
42	CLOVE OIL LORANN OILS INC. B25		POSITIVE BRICK RED PHOTO – B25	NEGATIVE