



People are still arguing about marijuana's links to motivation, and whether or not it reduces the drive to excel.

Urg and his pals (remember *them?*) didn't have a lot of techno-toys to measure the effects of pot. But even if they did, they would have found that some effects are hard to measure—so hard, in fact, that their modern-day descendants are still arguing about them.

One thing they're *still* arguing about is marijuana's link to motivation, and whether or not it reduces the drive to excel, in what's been labelled "amotivational syndrome."

Today, most experts consider the issue of marijuana's effects on



Smokeout at the TV corral: Are we having fun yet? We are? Cool!

motivation as a kind of chicken-and-egg situation. (Does pot reduce motivation or does it just appeal to people who are already unmotivated?)

On the other hand, many ex-users call pot a "spectator drug," one that turned them into passive

onlookers in their own lives.

One possible reason for the passivity linked to pot is that smokers don't have to actually *do* anything to be happy or entertained. All they have to do is get high, and pot does the rest.

And while it might *look* like fun to cruise through life stoned, it's a lot less fun than learning to pull your own strings and make life happen the way *you* want it to happen. Think about it.

Because too many people already have had to admit they watched the best years of their lives go up in smoke. They just didn't realize it at the time.

up in smoke

Okay. That's the story (more or less) of marijuana in America today. Some love it, some hate it, and there's even one or two out there (maybe) who just don't care.

So what's left to say?

Probably the biggest thing to remember is that marijuana is a complicated drug, so much so that, even after decades of research, we still



can't describe all of what it does, everywhere in the body.

More importantly, long-term effects still aren't fully known, either.

But just because researchers can't *prove* the problems they suspect doesn't mean they're not there. After all, it took 100 years to nail down the case against cigarette smoking,

but the risks were real all along.

Maybe the most important point to keep in mind about marijuana is this: Have a healthy respect for it and the problems it can cause and steer clear of them.

Because even though most of the wild-and-wooly "reefer madness" stories of the past were less fact than fiction, that *doesn't* mean pot can't cause real problems for real people. Make sure you're not one of them.

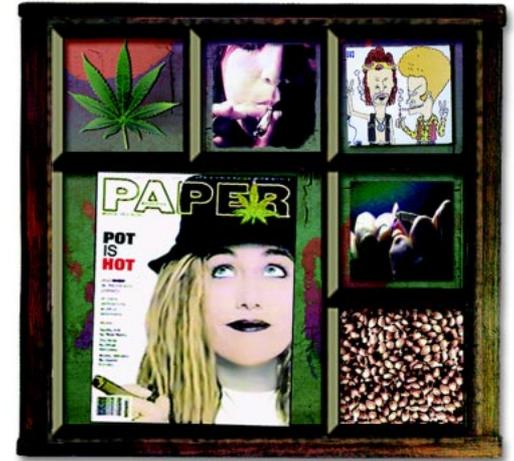


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New Facts, Old Fictions



about a hundred thousand years ago (we're guessing here), a half-frozen cave man named Urg (we're guessing here, too) made a discovery so big that its effects are still being felt all over the world.

Urg was cold, so he tossed a bundle of the plants he'd tugged out of the ground that afternoon onto the fire in his cave. Then, as he and his friends squatted over the fire and warmed themselves (and wished they had a Wii or PlayStation 3 or *something* to make life less boring), they noticed strange changes creep over them.

Everyone agreed that the shadows on the cave walls were suddenly *way weird, dude*, and the fire was *like, totally hypnotic, gnarly even*.

They also noticed that the chief's jokes (which they had all heard a thousand times) were funny again—at least



Smoke signals: *Homo erectus* meets *cannabis sativa*.

everybody laughed and pounded each other on the back and rolled in the dirt.

If Urg and his friends had given it any thought (instead of

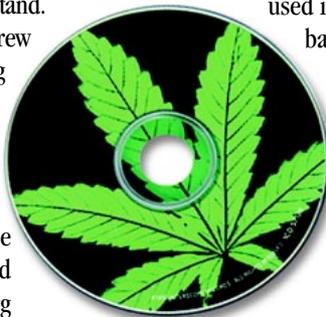
trying to rig a sound system out of some rocks and

old mastodon bones they found in a corner of the cave), they might have noticed other changes come over them, too—changes in the way they thought and felt and acted, that we're only now beginning to fully understand.

Because (surprise!) the weed that Urg threw on the fire was marijuana and, without knowing it, Urg and his pals had thrown the world's first pot party. This story isn't true, as far as anybody knows. (After all, prehistory wouldn't be *pre-history* if anyone left notes.)

On the other hand, it makes as much sense as a lot of other stories that have been passed around about marijuana since the first Urg noticed it growing down by the local watering hole and wondered what it was good for.

That's the point of this pamphlet, and the main reason we put it together.



Back to the future. Urg's heirs honor his discovery to this day by printing it on everything from CD's to baseball caps.



Because even though Urg didn't find all the answers to that question, the people who came later sure kept asking.

did they ever. In fact, at various times and in various places, they found uses for it for about every purpose you can imagine, and a few more besides.

The plant itself (sometimes called *hemp* and known botanically as *cannabis sativa*) is an excellent source of fiber, and has been used throughout the world to make rope and cloth and paper.

In fact, access to hemp and the ability to make rope from its fiber was so important to early tribes that it could spell the difference between first place and dead last in the battle for survival.

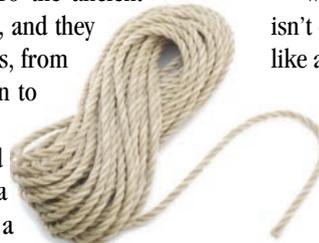
But man does not live by fiber alone, and hemp came to mean more to early humans than mere raw material for rope and clothes. To the ancient Chinese and others, it was a medicine, and they used it to treat a variety of ailments, from backaches and bad disposition to sunstroke and dysentery.

In India and Japan and Persia, it was revered as a holy plant and was used as a sacrament in religious ceremonies.

In fact, 10th-Century A.D. Hindus were so impressed by the effects it produced that they called it *indracanna*, or the "food of the gods."

"Food of the gods" or not, the plant (and the drug contained in its flowering tops) *has* made the rounds under a lot of

To early tribes, hemp could spell the difference between first place and dead last in the battle for survival.



different names over the years: It's been called *bhanga* and *ganja* in India and Jamaica, *boo*, *gag*, *pot*, *weed*, *reefer*, *grass*, *muggles*, *mezz*, *moota* (*moota?*) and a thousand other names in a thousand other places.



But whatever you call it, the real story about marijuana today involves the drug inside the plant.

And no matter what form that drug comes in—whether plain, old-fashioned, crushed-and-dried weed or the pressed resin known as *hashish* or the liquid resin known as *hash oil*—that story's a big story today, indeed.

So what kind of drug is marijuana? That's a simple enough question. Too bad it doesn't get a simple answer.

Why not? Because *pot* isn't a simple drug. It isn't even a single molecule like other drugs, like alcohol and cocaine.

Instead, it's a complex mix of some 420 different compounds. And, of them, 60 or so (known as *cannabinoids*) exist nowhere else in nature.

The most important cannabinoid in *pot* is a little number known as *delta-9 tetrahydrocannabinol* (THC, for short). THC is the main mind-altering ingredient in marijuana, and the biggest news about it is how much of it is turning up in new, high-potency forms of *pot*.

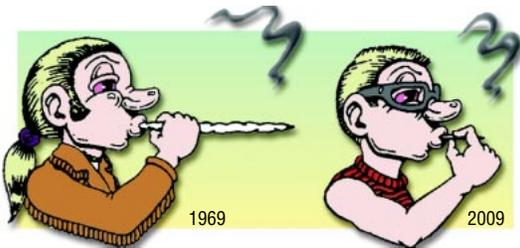
Just a few years ago, most marijuana sold in the United States averaged about 2 percent of the drug, which was (and is) plenty. ▶



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Today, it's not hard to find pot with a THC content of 7, 8 or even 10 percent. And that extra potency packs a punch—in the form of more intense effects and greater potential risks.

Still, THC isn't the whole story. Because even though it's the chemical most responsible for pot's effects, it's not alone.



Now & Then (Part 1). Marijuana is often stronger now than in years past, meaning a little pot today goes as far as a lot did then.

Other cannabinoids — with names like *cannabinol*, *cannabinicyclol*, and *cannabidiol* — are there, too. And, for the moment, they're still mostly unaccounted for.

Since everyone has some idea about what the marijuana high is like, we're not going to waste a lot of time talking about that.

What we *will* say is that most effects — euphoria, sensory distortions, and altered feelings — kick in fast, usually before a smoker finishes a joint.

Other effects kick in quickly, too, including time distortion and increased appetite (AKA "the munchies"), which can show up in the form of an inexplicable urge for a 36-inch extended-family-size pizza or a sudden impulse to build a truly *world-class* sub out of everything in the refrigerator.

Most *subjective* effects peak in about an hour and wear off in 3-4 hours. So do pot's main *objective* effects — ones that are detectable outside the body, like bloodshot eyes and increased heart rate.

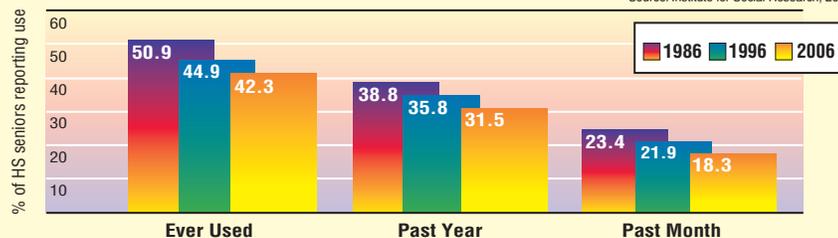
We could spend a lot of time talking about external changes. But if we did, we'd miss the real story, the one that takes place *inside* the body — and mind.



Culture Clash. Pot has served as a symbol of youthful rebellion since the 1960's. Back then, Bob Dylan reflected the spirit of the times in *Rainy Day Women* (Nos. 12 & 35): "Everybody must get sto-o-need!"

▶ NOW & THEN (Part 2)

Source: Institute for Social Research, 2007



Disappearing Act. Marijuana use has dropped in recent years, lagging far behind rates recorded 20 years ago. Main reasons for the decline: Increased perception of risks and decreased tolerance of drug use in general.

marijuana impairs short-term memory, which can be a **disaster**, if you care about your grades—and a serious drag, even if you don't.



To see how that story unfolds, let's take an imaginary trip inside the body tissues and organs of a smoker to track some of the more important changes as they occur.

Our trip won't cover all the things that pot does in the body, but it should be enough to give you a better idea of what marijuana does to a person when a person does marijuana.

■ **Ground Zero.** When a smoker lights up, the first big biological change comes in the form of a blast of tar and other gases that rushes to the lungs, after first irritating the tissues of the mouth, nose, and throat.

You might also hear a cough as the lungs do what they're supposed to do — expel irritants.

Gradually, though, the lungs adjust, and the smoke stays down. That's when THC and other chemical components of marijuana pass through the bronchial tubes to the capillaries, where they're absorbed into the bloodstream.

Once in the bloodstream, cannabinoids rush to the heart, where they trigger a jump in heartbeat, sometimes as much as 50 percent above resting rate.

That increase isn't a problem for most people, but researchers warn that it could be more serious for older people and those with heart disease.



Turn on, tune in, munch out. One of the most common effects of pot is to turn up hunger—and turn down willpower.

■ **BioTransport.** All that hyperactivity in the heart has one clear effect, though: It pumps cannabinoids to other body organs, triggering a variety of physical effects, from decreased pressure inside the eye to increased muscular relaxation—also not a problem for most people.

But since cannabinoids are fat-soluble, they zero in on areas having a high fat content, such as the sex glands and brain.

Once THC hits the brain and acts on receptors there, the subjective feeling of being high kicks in. That's when marijuana's thought and mood changes start.

At this point, the liver and kidneys swing into action, breaking THC and other cannabinoids down into less-complicated, more easily-eliminated chemicals.

■ **tissue issues**

About half the breakdown products (or *metabolites*) leave the body within 24 hours, but others — stored in fatty tissue — hang around, almost like biochemical leftovers.

But unlike leftover food in a refrigerator (which can disappear faster than a pot smoker can say "Hold the mayo"), cannabinoids are detectable for days or weeks.

What effects do they produce while they're hanging around?

No one knows for sure, but since they *are* still drug molecules, they could cause subtle effects that are almost impossible to trace.

So much for the grand tour. Now we'll narrow our focus down to examine what pot does to key body systems.

Because even though no one knows yet what *all* those effects are, we know enough about some of the hotter research topics to consider them in detail.

These effects are grouped around three major body hot spots: the lungs, brain, and the organs and glands that regulate growth and sexual development.

■ **Lungs.** Probably the clearest health risk posed by pot is the danger to the lungs.

That's because marijuana smoke contains the same cancer-causing chemicals found in tobacco smoke. And since pot smokers hold marijuana smoke in the lungs longer, regular use could pose the same kinds of cancer risks as cigarette smoking.

In addition, pot smokers also raise their risk of other lung problems, including bronchitis and emphysema.

That risk is considered higher still for people who smoke both pot *and* cigarettes.

■ **Brain.** Since THC accumulates in the brain for such long periods of time, and since the brain is so near and dear to all of us, research into its actions there has been the most closely-watched area of marijuana research in recent years. And from what we know today, those effects *are* something to think about.

■ **Brain drain.** Pot can dull memory and reduce the ability to perform complex tasks or follow complicated instructions.

The most striking set of effects involve memory. Recent studies show that pot can disrupt short-term memory — the process in which recent events are encoded and stored in the brain.

■ **pot's hot spots**

This effect can be a disaster if you care about your grades and your future — and a serious drag, even if you don't.

Other potential problems aren't much fun, either.

Calculation skills, reading comprehension, and other abilities can also be dulled by the drug, with effects lasting several hours after the high disappears. And the more you smoke, the longer they seem to last.

The same thing happens to reaction time and visual tracking ability, which could be a problem in certain circumstances, like driving a car. That's why it's as bad an idea to drive after smoking as it is to drink and drive.

■ **Growth & Sexual Development.** Another hot spot that's attracting serious scrutiny involves body systems that regulate growth and sexual development.

Interest here has heated up as the age of pot smokers has dropped. And as users' ages have fallen, concern about possible risks have increased — and for good reason.

What's known at the moment is that marijuana causes changes in hormone levels of users which **could** alter normal patterns of growth and sexual development.

In boys and men, it causes decreased blood levels of *testosterone*, the main male sex hormone. In women and girls, levels of two hormones drop following marijuana use.

Researchers aren't sure if any serious problems result from reduced hormone levels in adults. What it could mean to younger people is another question, altogether.

And according to most experts, it's as good a reason as any for kids to pass on pot altogether. ▶



Marijuana & the Media: The media's been hooked on pot for years—at first, as a focus for sensationalistic stories and always as a source of controversy.

As important as pot's effects on the body are, its effects on personality and behavior are just as important and at least as complex. Scientific interest in its effects on the mind have heated up in recent years, since the discovery of brain receptors for THC, pot's main mind-altering component.

Main concerns at the moment revolve around the following issues:

▶ **Personality changes.** "Reefer madness" stories of the past *were* far-fetched, often the ravings of the misinformed or the misguided. But recent research suggests that marijuana may leave a more lasting mark on the mind.

In a 1990 study, researchers at the Karolinska Institute in Stockholm found that people who smoked pot more than 10 times were 2.3 times more likely to develop schizophrenia than non-smokers. And even though it remains unclear whether the link is causal or coincidental, those who smoked 50 times or more were found to be 2.9 times more likely than non-smokers to develop the disease.

▶ **Panic reactions.** High-potency pot is linked to an unknown, but increasing, number of panic reactions. In 2005, pot figured in to more than 242,000 U.S. emergency-room admissions, many involving anxiety reactions in users.

▶ **Memory deficits.** Pot's effects on short-term memory have been known for a long time. What's new is evidence that impairment may last as long as six weeks after use is stopped by heavy smokers and users of high-potency pot. ■



■ **marijuana & the mind**