

IRAQ – a nuclear war?

An illustrated public lecture given by Robert Anderson PhD
following the conflict that began on 20 March 2003

(Length: 40 pages and 56 slides)

The “Iraq – a nuclear war?” lecture was presented throughout New Zealand from 2005 onwards.

Warning: some of the images presented are graphic.

N.B. Some facts and figures may have changed since the lecture was last presented.

In a nutshell, and on public record, depleted uranium (DU) weapons have been used in conflicts since the 1991 Gulf War.

DU rounds were test fired at Okinawa, Japan, then removed to Osan Air Force Base in South Korea and test fired on three small islands off the southwest coast, two minutes flight time away. They have been test-fired 3km from Socorro in New Mexico, and between the mid-80s and 1994 at the Army Proving Ground in Indiana leaving some 70 tons of DU, shell fragments and contaminated buildings. The Nuclear Regulation Commission allows 7900 DU rounds of 30 mm shells to be fired annually on the Las Vegas side of the Nellis Air Force Base by the Nevada Nuclear Testing Site.

In 1999, the US Navy admitted to “accidentally” firing 263 rounds of DU bullets. Doug Rokke, a leading authority on DU, says 263 rounds is “not even a burst of automatic gunfire.” Planes that fire DU ammunition shoot 3000 to 4000 rounds per minute and, as the Pentagon keeps track of all ammunition, the firing could not have been an accident.¹

DU armoured tanks have been used by Israel on the West Bank and Gaza, and in Lebanon. On 7 July 2009, the result of an International Independent Fact Finding Mission mandated "to investigate all violations of International Human Rights Law and International Humanitarian Law that might have been committed at any time in the context of the military operations that were conducted in Gaza during the period from 27 December 2008 and 18 January 2009 whether before during or after" was released. It found “Depleted Uranium (DU) weaponry was and are still being used in the Gaza Strip which again is in violation of the Geneva Convention” and “The use of White Phosphorus on densely populated areas is in violation of the Geneva Convention.”²

The US Department of Defense claims DU does not compromise human health. Dan Fahey, Director of Research at the Gulf War Resource Centre, says the RAND report, which the DoD used to substantiate its claim, was incomplete; it ignored clear relationships between DU and harm to human health.³

(See also page 40.)

¹ Commission on Human Rights. ‘Question of the Violation of Human Right and Fundamental Freedoms in Any Part of the World: The Human Rights Situation in Vieques, Puerto Rico.’ UN. 2004-03-03. Retrieved on 2007-01-18.

² Ruiz-Marrero, Carmelo. (2001). "Vieques Residents Alarmed by Depleted Uranium Reports". Inter Press Service. 2001-01-30. <http://www.commondreams.org/headlines01/0130-03.htm>.

³ <http://www.rense.com/general86/gazz.htm>

Slide 1



Friends

I do not know how many of you saw the documentary film, “The Doctor, the Depleted Uranium and the Dying Children.” After seeing it, I was so appalled that I felt the need to let others know what has occurred in Iraq.

The coalition of US President, George W Bush, and British Prime Minister, Tony Blair, ensured that journalists were ‘embedded’ with their military during the Gulf War that began in 2003. Consequently, very little of the real truth escaped into the world’s mainstream media. Apart from the few brave journalists who remained in Falluja and Baghdad, we, the public, knew little of the conflict that really took place.

It is now patently clear that the 2003 Iraq War was a nuclear war; a war that will be a threat, not only to Iraqi people now and in the future, but to the world as a whole. Why? Because depleted uranium (DU) weaponry was used.

Before looking at the depleted uranium issue, it is necessary to appreciate a bigger picture. I’ll fill in some of the canvas for you.

Hearing the news coming from the Middle East, we wonder what is going on and why – and, more importantly, when is it going to stop. The simple answer is, it isn’t. The world is in the first stages of a multi-step ‘end game’ for global domination of oil reserves. These ‘energy wars’ will be ongoing.

As renowned journalist, John Pilger, said: “The Gulf War was not a war at all. It was simply an epic act of homicide.” One perfect example is the complete destruction of Iraq’s medical infrastructure after the US so-called, ‘Operation Steel-curtain.’

Slide 2



Destroyed hospitals and medical care centres, houses, shops, offices and the only bridge. Walls covered with bullets holes. Empty faces with bleak looks wandering in the streets. This is the picture of Al-Qa'im after "Operation Steel-Curtain." [1991]

Bombed ambulances

The US health and human services secretary, Tommy Thompson, revealed just how low a priority rebuilding Iraq's medical services were when he commented that their hospitals would be fixed if the Iraqis "just washed their hands and cleaned the crap off the walls." 2



Bombed hospitals

Naomi Klein in Baghdad April 3, 2004 The Guardian

Enormous propaganda was devoted to covering up this invasion and promoting the so-called 'smart' guided weapons. It was as if war had finally become a *real* science. The bombing of the Al-Amiriya bunker in Baghdad, incinerating more than 300 women and children, was a case in point.

Less than seven percent of the weapons used in the 1991 Gulf War were 'smart' bombs – most were standard old-fashioned 'dump' bombs. And seventy percent of the 88,500 tons of bombs dropped on Iraq and Kuwait in 1991 fell in populated areas. That is equivalent to around seven Hiroshimas.

Unknown to embedded journalists, in the last two days before the ceasefire, US armoured bulldozers were reportedly deployed at night, burying Iraqis alive in their trenches, including the wounded. The US Commander, Barry McCaffrey, denied this. Six months later, *New York Newsday* disclosed that three brigades did use snowploughs mounted on tanks to bury thousands of Iraqi soldiers – many still alive – in more than 70 miles of trenches. Brigade Commander, Colonel Anthony Moreno, said, and I quote: "For all I know, we could have killed thousands." They undoubtedly have.

The policy of Norman Schwarzkopf, the then US Commander-in-Chief, was that the Iraqi dead were not to be counted. One of his senior officers boasted, and again I quote: "This is the first war in modern times where every screwdriver, every nail, was accounted for." As for human beings, he added: "I don't think anybody is going to be able to come up with an accurate count for the Iraqi dead."

Shortly before Christmas 1991, the Medical Educational Trust in London published a comprehensive study of casualties of that first Gulf conflict. Up to a quarter of a million men, women and children were killed or died as a direct result of the US-led attack on Iraq and its immediate aftermath. In evidence before the Parliamentary Foreign Affairs Committee, major international relief agencies reported that 1.8 million people had been made homeless, and Iraq's electricity, water, sewage, communications, health, and industrial infrastructure had been "substantially destroyed," producing "conditions for famine and epidemics." This was not generally reported.

Then came the most covered war in history, and virtually all of us missed the story of Iraq.
(From <http://pilger.carlton.com/iraq/articles/19182>.)

In 2005, following the second period of conflict, there are many uncertainties about the future prospects for stability in Iraq, but there is at least one indisputable fact: the Bush Administration vastly underestimated the cost of this war. Not only in human lives, but in monetary terms as well. The total cost of the US-led invasion of Iraq far exceeds the Administration's initial project of US\$50 billion. It is now estimated at over a trillion US dollars.

So what really happened in Iraq? Why did we get a false picture?

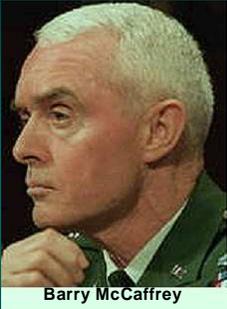
The Bush Administration was determined to gag journalists in order to avoid another Vietnam-type fiasco. Many of you will remember the famous photograph of a nude young girl running; suffering napalm burns, and how that shot was instrumental in aiding the end of the Vietnam War. Unlike Vietnam, the Bush/Blair coalition made sure this time that journalists were 'embedded' with their military in order to 'sanitise' the information going out to the mainstream media. They could also then use those journalists as an information dissemination tool for the military. Again, John Pilger: "It was put together like a video game: the whole family could play. Pinpoint, laser-guided bombing, etc. All very exciting stuff." Not surprisingly then that, apart from those few brave journalists who remained in Fallujah, Baghdad, etc., we know little of the *real* conflict.

The number of journalists killed in the current Iraq war is now close to seventy. The work of these brave, independent journalists has been, and remains, critical: Jessica Mitford, Seymour Hersh, Robert Fisk and, of course, Italian journalist Giuliana Sgrena who the US tried to kill. The reason they tried to kill her? She brought back photographic evidence that the US had murdered civilians in Fallujah and used internationally banned white phosphorus to assist them. Their first reported target in that attack was the general hospital.

Seymour Hersh was one of the journalists who uncovered some of the most horrifying war crimes of the Iraq War – particularly those under the command of McCaffrey. Let me give you just a small example of what Hersh brought to light.

Slide 3

Army insiders called it, "One of the worst war crimes by US forces since the My Lai massacre in Vietnam."



On a 60-mile stretch of road from Mutlaa to Basra, a convoy of over 2000 vehicles and tens of thousands of civilians were fleeing. These people were putting up no resistance: families leaving in cars, trucks, carts, and on foot.

The US forces bombed each end of the highway, sealing it off. Then, using artillery, both from the air and the land, they massacred every living thing on the road.

One US pilot said, "It was like shooting fish in a barrel." That fateful stretch of road is now called the 'Highway of Death.' 3

(N.B. General Barry McCaffrey commanded the 24th Infantry Division (Mechanized) during Operation Desert Storm (August 1990–February 1991) and was awarded a Distinguished Service Medal. Also known as the Persian War, the coalition of 34 nations, led by the United States, expelled Iraqi forces from Kuwait and followed them into Iraq.)

The first drafts of the chapters of history about the latest Iraq War were written by journalists like Seymour Hersh who risk their lives to uncover the truth. Because of this, non-embedded journalists were purposefully targeted throughout that war by coalition forces. Here is an example. A large number of them were staying at the Palestine Hotel in Baghdad. As a precaution, the map co-ordinates and full details of its location were given to the Pentagon. Even so, it was bombed!

Slide 4 – A dying cameraman

Journalists were targeted



Reporters carrying wounded Reuters cameraman, Taras Protsyuk, from the Palestine Hotel in Baghdad. He later died. American tanks fired on the hotel killing two cameramen and wounding three other journalists. The Pentagon passed on the location of the hotel knowing full well that only journalists would be there. 4

It is clear that both Iraq Wars were nuclear wars. Unfortunately, what few of us realise is that these wars threaten not only Iraqi people now and in the future, but all of us. The Pentagon does all it can to hide this fact. And the contempt with which critics are treated by the US Administration is self-evident. But let me tell you a strange fact. US Army video-1995, outlining the dangers of depleted uranium, was never shown. Comments made by Henry Kissinger encapsulate perfectly the official attitude.

Slide 5

Henry Kissinger is well known for making outrageous statements. Some of his more brutal are:



"Military men are just dumb stupid animals to be used as pawns in foreign policy." Kiss the Boys Goodbye, Dutton, 1990.

"Oil is much too important a commodity to be left in the hands of the Arabs." Halliday and Sponeck 2001-11-29

"Depopulation should be the highest priority of US foreign policy towards the Third World." Memorandum to the NSC 5

I particularly wanted to show you this slide in order to demonstrate the kind of attitude that prevails in the US Administration. People are expendable - their own, as well as others - if it achieves the desired end, one of which is to reduce population levels. (Of interest here is "The Project for a New American Century" – you can access it and related material on the Internet.)

Remember - 3000 US citizens died to guarantee that 9/11 would be another 'Pearl Harbour' – the emotive persuasion to justify the US invasion of Iraq in 2003. There is increasing evidence that Dick Cheney and George Bush were well aware of the true situation, and reports suggest they may even have been complicit in it. It is also reported that Russia's President, Vladimir Putin, fully informed George Bush that the 'Twin Towers' attack was imminent.

Slide 6 – The US Administration

This attitude cannot be better illustrated than in the recent Iraq War. Not only did this war of "liberation" result in the deaths of 100,000 Iraqi's - mostly women and children - it also cost the lives of thousands of Americans and around 200,000 permanently disabled troops.

Why? BECAUSE THESE MEN LIED!



The image contains four small, square portrait photographs arranged horizontally. From left to right: Dick Cheney, George W. Bush, Tony Blair, and Vladimir Putin. Each portrait is set against a dark background within a larger green-bordered frame.

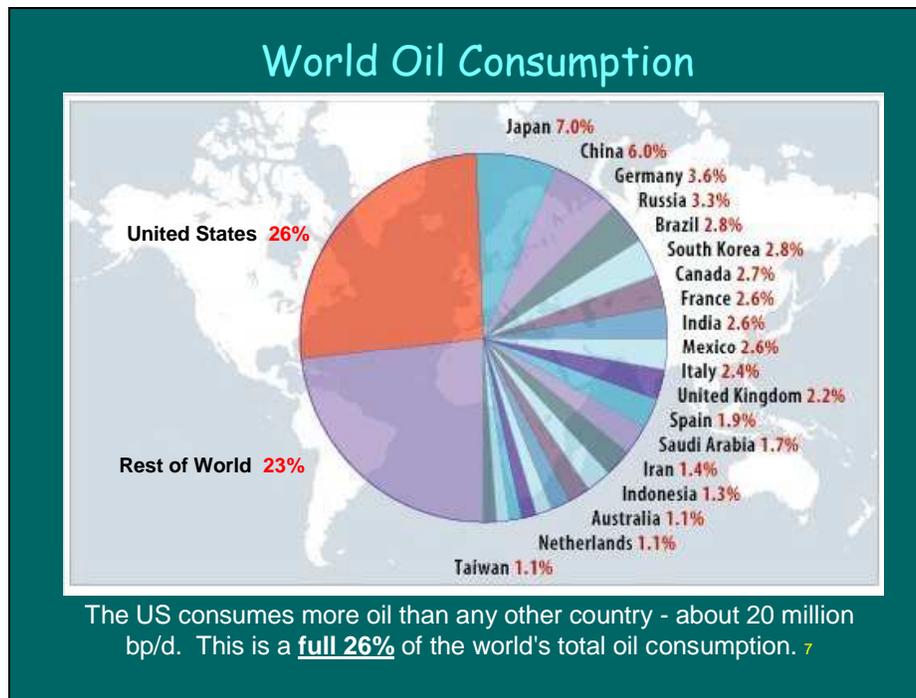
There were no weapons of mass destruction. The US and Israel hold virtually all of them.

Further, the infamous, secretly leaked 'Downing Street Memo' revealed that George W Bush and Tony Blair were fully intent on invading Iraq at least as early as the summer of 2002; at the same time, ensuring they gained control of the oil fields.

The recent threats to Iran over their nuclear programme, is similarly hyped to lead to control of that country's oil.

And, by the way, the US uses more of this world's oil than any other country.

Slide 7 – Global oil consumption



Not only have the US procured Iraq's oil, the restoration profits have also swelled their corporate coffers. Publicly, all the contracts for the restoration work were to be tendered for, but it seems clear they became jobs for the boys.

The main job of overseeing the repair work of Iraq's oil infrastructure was awarded to Halliburton, a company formerly headed by Dick Cheney.

A total of 220 giant projects were planned to get Iraq's oil production up to pre-war levels with a total estimated cost in excess of US\$1.5 billion.

Not bad if you can get it, and Halliburton did.

Slide 8 – Why the US went to war

If you think this is an exaggeration, I highly recommend the book, "*Crossing The Rubicon*" by Michael Ruppert.



The 9/11 attacks represented the 'Pearl Harbour' which provided a pretext for war. It would enable an all-out drive for the planet's last reserves of oil and gas. This was a war that Cheney said, "Would not end in our lifetime." 8

This picture was put together in Denmark and widely circulated on the Internet.

I would like to state here that I am *not* anti American. I have several dear friends there for whom I now feel grave concern. I am also in regular contact with many American citizens who share these concerns. For instance, many of them demonstrated against the cruel sanctions imposed on Iraq between the two conflicts and it is worth looking in some detail at these.

Slide 9 – Sanctions against Iraq

First the brutal sanctions

UN sanctions imposed on Iraq, largely at the request of the US government, caused untold suffering, particularly to Iraqi women and children. Columbia University professor, Richard Garfield, an expert on sanctions, estimated that the sanctions had resulted in infant and young-child fatalities numbering around 530,000.

Saddam's government was unaffected.



Women fighting for water

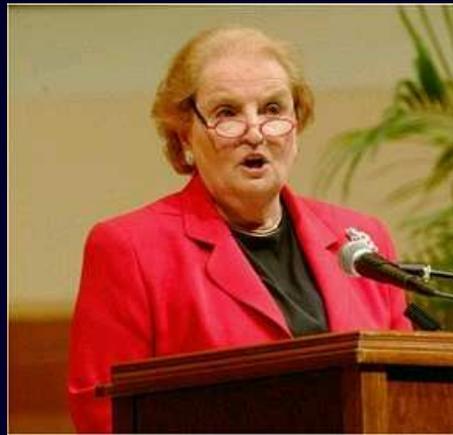
Despite these well-known facts, DU weapons again rained down on Iraq causing even further suffering for these people. 9

UNICEF estimated that from 1991 to 1998, there were half a million deaths among Iraqi children under five years of age. On average, this amounts to 5,200 deaths each month. Then US President, Bill Clinton, and British Prime Minister, Tony Blair, claimed that their actions against Iraq were guided by "humanitarianism."

Two former UN humanitarian co-coordinators were so sickened by the process they resigned. Dennis Halliday resigned in 1998 in protest at sanctions he said were "destroying a whole society" and his successor, Hans von Sponeck, resigned later because he could "no longer tolerate the suffering caused by sanctions." Two days later, the head of the UN food programme in Iraq also resigned.

Can you even start to imagine the suffering that the subsequent invasion was to cause?

Slide 10 – A price worth paying



When Madeline Albright, the Secretary of State, was asked if she thought the lives of half a million Iraqi children was a "price worth paying" to target Saddam Hussein she replied in an exquisite moment of honesty. . . .

*"We think the price was worth it."*¹⁰

For some time, I have corresponded with US Senator, Karl Schwarz, over the issues of depleted uranium and the current invasion of Iraq. You may care to see his views.

Slide 11 – Iraqi Insurgency: Terrorism or Outrage?



Iraqi Insurgency: Terrorism or Outrage?

If the Iraqis invaded the United States and started privatizing the assets of my home state, literally stealing what is the economic backbone of my nation, I think I'd be inclined to pick up a gun and become an "insurgent."

There is a big difference in a patriot standing up for his nation, and a "terrorist insurgent" when the nation has been invaded by a trespasser, a thief.

What a legacy we're leaving behind in a nation we supposedly freed from oppression and offered them freedom and democracy. The Iraqis well know what a lie that is. ¹¹

Karl W.B. Schwarz

And that lie has had a dreadful backlash.

Slide 12



We should never forget:

It is in the subjugation, humiliation and harm to the living and unborn that the heart of a terrorist is born.

When hope is denied, hate takes it place. ¹²

The understandable rebellion against the invasion has left Iraq in a virtual state of civil war.

Slide 13 – Iraq in the cross hairs

Research shows that Iraq had been a target for some time.

The plans for the invasion of Afghanistan, the invasion of Iraq, the world-wide deployment of US military forces to control oil reserves, the Patriot Act, Homeland Security, and legislation that sets the stage for biological warfare and complete domestic repression were all in place well before the first plane struck the World Trade Centre.¹



With 11% of the world's oil, Iraq had been in the crosshairs for a long time. ¹³

1. Crossing the Rubicon pp 471

The cost to Iraq's people of this eleven percent has been grim indeed. The harmful effects of depleted uranium ammunition will persist for billions of years. As Hans-Peter Schnelboegl, said, "DU war is war against all future, and in that respect worse than Hiroshima and Nagasaki."

Most folk assume the conflicts in Iraq, the Balkans and/or Afghanistan were *not* nuclear wars. They would be wrong. They were worse. The harmful effects of depleted uranium ammunition is proving worse than dropping atomic bombs. And the damaging effects will persist for *billions* of years.

So what is this new horrifying form of weapon which will come to affect us all?

Slide 14 – Using the leftovers

So what is depleted uranium?
Depleted uranium (DU) is what is left over when most of the highly radioactive isotopes of uranium are removed from the ore for use as nuclear fuel or nuclear weapons.



DU is used in armour-piercing shells, bunker penetration bombs and missiles. ¹⁴

The military and governments have consistently misrepresented the radioactive and toxic effects of depleted uranium in order to avoid public protests that could lead to a ban on DU weapons.

Why?

- Because this would put the US and other NATO countries at a military disadvantage in situations where they see DU ammunition as required to destroy enemy heavy armour and concrete bunkers.
- Admission of DU harm would also mean multi-billion dollar liabilities for lives and health of over 100,000 veterans in the US alone. (Reference: an e-mail from the US Veterans Association.) It would be even more for civilians near battlefields.
- And then there are the cleanup costs at DU waste storage facilities, and production and military sites and areas.

Remember: as mentioned earlier, the US Army has a video outlining the dangers of depleted uranium that was never shown.

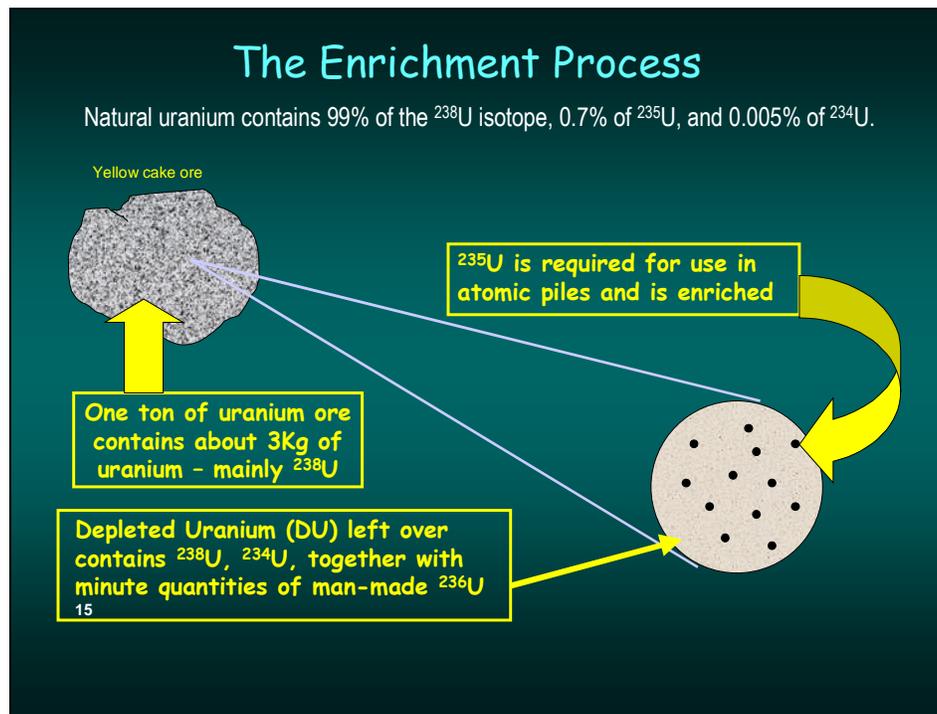
Illustrated in slide 14 above is the infamous Guided Bomb Unit (GBU-28). This specialised weapon was developed for penetrating hardened Iraqi command centres located deep underground. The GBU-28 is a 5,000-pound, laser-guided, conventional bomb, but uses a 200 Kg depleted uranium-penetrating warhead.

You may care to know that the development/production cost was US\$18.2 million and each bomb costs US\$145,600 (<http://www.fas.org/man/dod-101/sys/smart/gbu-28.htm>).

The GBU-28 was the bomb used to destroy the Iraq broadcasting building. It also destroyed the Al-Amiriya bunker in Baghdad, incinerating more than 300 people, mostly women and children sheltering there. Like the hotel filled with journalists, this was marked as a “military” target.

Slide 15 – Enrichment

So how to we get depleted uranium?



Uranium ore U_3O_8 is a crystalline blend of UO_2 and UO_3 in a 1 : 2 ratio. It is known as pitchblende or "yellow cake."

Let us look at Slide 15 again.

If we take one ton of uranium ore, it will contain around three kilograms of uranium.

Natural uranium contains 99.274 percent of ^{238}U , 0.7 percent of ^{235}U , and 0.005 percent of ^{234}U . From these figures, it is obvious that huge amounts of ore are needed to yield the 235 isotope (^{235}U) in any quantity. Correspondingly, vast amounts of *depleted* uranium will remain as a 'waste' product.

But 'depleted' is a misnomer. Depleted uranium is a thoroughly toxic material.

The obvious question then is, what do we do with all this depleted uranium?

Slide 16 – The waste solution

Disposing of this vast quantity of DU is a problem.
What better solution than to use it in weapons?

After 50 years of producing enriched uranium for nuclear bombs and reactors, the US has a waste stockpile of thousands of tons of depleted uranium.¹⁶



You will see that, by giving depleted uranium to the military for weapons, the saving on disposal costs of this 'waste' product is considerable. Just as we have been persuaded to add fluoride 'waste' from the phosphate fertilizer industry to drinking water supplies, the disposal costs of other industrial wastes are conveniently solved. So what makes depleted uranium such a hazard?

Slide 17 – What makes DU such a potential hazard?

What makes DU such a potential hazard?
DU is a heavy metal that is radioactive. It is roughly twice as dense as lead (1.7). It has a chemical toxicity that causes severe adverse health effects.

It is pyrophoric and burns its way through armour at a temperature of 3000 - 5000°C.

At this temperature, it forms ultra-fine particles of radioactive dust which rise into the upper atmosphere to be carried round the globe.¹⁷



The effects of an explosion of a depleted uranium round cannot be contained. It took about four days for DU contaminated dust to be detected in Washington in the United States. Around that time, it was also detected in the UK. (See Chris Busby's report [pdf]; see also Slide 30.) Does this sound credible?

In the past, I have been in London and witnessed sandy dust from the Sahara Desert settling on parked cars after particularly high southerly winds. It would have travelled a distance of around 2000 or more kilometres. Credible? Absolutely.

Flying at 7000 feet in a thermal above Hawkes Bay (New Zealand), a glider pilot reported having cornhusks and other debris around his craft, drawn up from a corn harvester below. This debris would have then carried on upwards or moved laterally. Wind systems surround Earth similar to its ocean currents.

Australian insects have made it across the Tasman Sea to New Zealand, some 1600 kms; simply blown here by the wind.

Dust and debris move long distances in this way. And contrary to the Pentagon's reassurances, radioactive nanoparticles of DU material will be carried for thousands upon thousands of kilometres into the atmosphere and around Earth.

Slide 18 – A little theory

To fully understand the dangers of radioactive material, let us dip a bit further into depleted uranium and radiation. It is not too difficult, so please bear with me.

A LITTLE BIT OF THEORY

There are basically three forms of radiation to consider:

- ALPHA (α) particle - which is a Helium nuclei ^4He ,
- BETA (β) particle - which is a high energy electron,
- GAMMA (γ) ray - a burst of high energy X-ray.

HALF-LIFE ($T_{1/2}$) - the time taken for a given sample to fall to half of its original value. ¹⁸

The diagram illustrates the penetration of three types of radiation from a lead castle source. Alpha particles (red arrow) are stopped by thin paper or skin. Beta particles (green arrow) are stopped by heavy cardboard. Gamma rays (blue arrow) pass through both thin paper/skin and heavy cardboard, and are only stopped by a lead sheet.

So what actually happens in the case of DU?

The Pentagon's explanation that, "You get only low level alpha radiation from DU" is seriously misleading.

Slide 19 – You get the lot

Alpha, beta, gamma ... you get the lot!

The nature of radioactive decay is such that α or β emissions from an atom result in that atom changing into a different element.

- * An atom of ^{238}U (99% of DU) emits an ALPHA particle and decays into an atom of thorium, ^{234}Th . Thorium is a BETA emitter with a $T_{\frac{1}{2}}$ of 24 days.
- * That soon decays, emitting its BETA particle and transforming itself into an atom of protactinium, ^{234}Pa . This is also a BETA emitter, with a $T_{\frac{1}{2}}$ of 7 hours. That atom also decays quickly and emits its BETA particle.

Both of these beta decays give out GAMMA ray emissions.

Thus within a very short time, DU is emitting not only alpha radiation, but also beta and gamma radiation. After a few months, the concentrations of these two daughter products will have built up so that the amount of beta and gamma radiation will each be TWICE the amount of alpha radiation.¹⁹

Slide 20 – External exposure to DU

Thus external exposure to DU entails exposure to alpha, beta *and* gamma radiation.

Although the skin blocks alpha particles, beta and gamma radiation penetrate the skin layers and damage tissue.

Beta particles can penetrate up to 2cm. Gamma radiation generates beta particles along its track through the body
(by a process called the Compton effect).

This is a silent killer. You cannot smell, taste or hear radiation. ²⁰

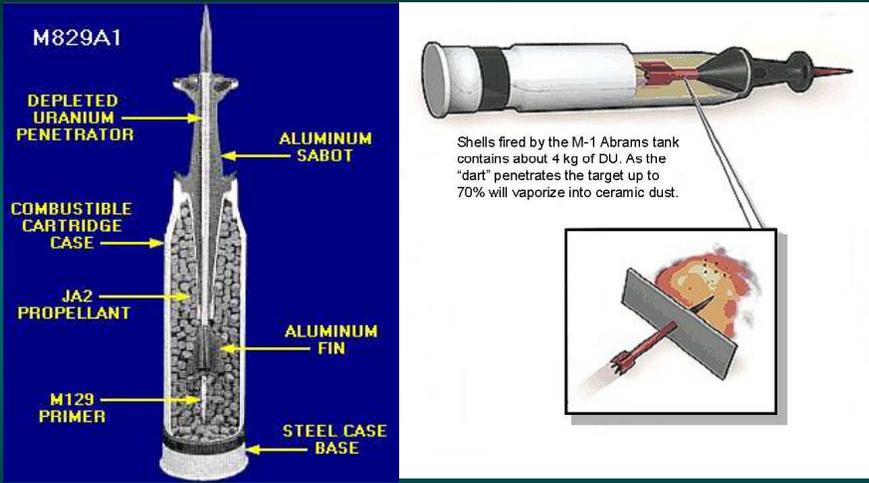
Slide 21 – Summarising DU weaponry

Summarising DU weaponry

- * DU weapons are very effective penetrators, but even more effective bio-weapons since uranium has a strong chemical affinity for phosphate structures in human DNA.
- * DU is the Trojan Horse of nuclear war - it keeps killing. There is no way to clean it up, and no way to turn it off because it continues to decay into other isotopes.
- * The US has illegally conducted four nuclear wars since 1991 - in Yugoslavia, Afghanistan and twice in Iraq - calling DU "conventional weapons" when in fact they are nuclear weapons. ²¹

(N.B. There has also been conflict in Lebanon where tests showed that DU weapons had been used.)

Slide 22 – A DU shell



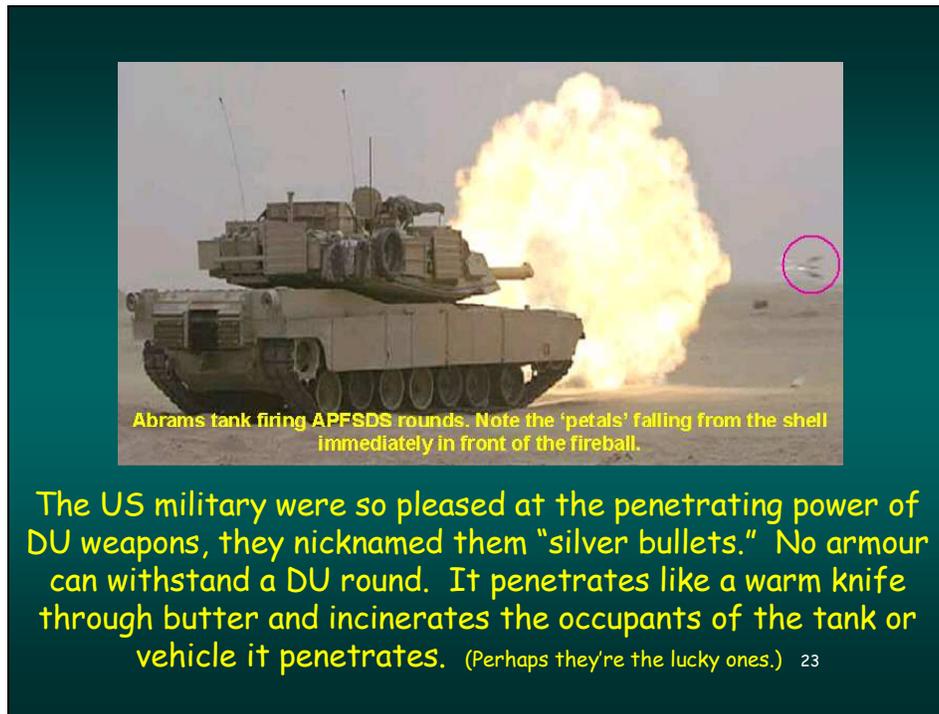
The diagram illustrates the internal structure of an M829A1 DU round. On the left, a vertical cross-section shows the following components from top to bottom: a DEPLETED URANIUM PENETRATOR, an ALUMINUM SABOT, a COMBUSTIBLE CARTRIDGE CASE, JA2 PROPELLANT, an M129 PRIMER, and a STEEL CASE BASE. On the right, a horizontal view shows the shell with an ALUMINUM FIN. A text box explains: "Shells fired by the M-1 Abrams tank contains about 4 kg of DU. As the 'dart' penetrates the target up to 70% will vaporize into ceramic dust." An inset image shows the shell hitting a target, with a large plume of dust and smoke.

The inside of a typical DU round, the M829A1. ²²

Contrary to Pentagon denials, depleted uranium *is* a component of their military ammunition, not least because they have patents for its use.

Slide 23 – Tank firing round

Let us look more closely at this process. This slide shows a typical cross-section of a DU round fired from an Abrams tank. The 'petals' or Sabot falls away shortly after the round has left the barrel.

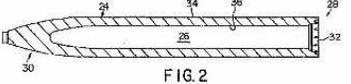
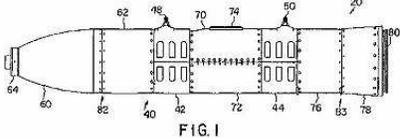


To see the effects of a DU round hitting tank armour is a terrifying spectacle. First, there is a relatively small explosion. When the DU penetrates into the tank, there almost immediately follows a gigantic explosive fireball as the round detonates all of the ammunition within the tank.

Slide 24 - How much depleted uranium did the coalition use?

US patents confirm Uranium warheads

e.g. **US Patent 6,389,977**
2000 lb Shrouded Aerial Bomb
BLU – 109/B warhead upgrade
Lockheed Martin 1997-2002



This new hard target warhead has Tungsten and **Uranium** penetrator options.

The upgraded 2000 lb warhead is called **BLU-116** and can be used in **GBU-15, 24, 27, 31, & AGM-130C** guided bombs plus **BLU-118/B** Thermobaric bomb.

In 1991, for nearly 40 days and nights, the US rained down 80,000 tons of explosives on Iraq - more explosives than were used in all the conventional bombing of Europe in the whole of World War Two.

Slide 25



Loading DU into tanks

So just **how much did they use?**



In 1991, in **DESERT STORM**, 375 tons of Depleted Uranium weapons were used.



In OPERATION ENDURING FREEDOM, 2200 tons were used by 2004!

Radiation Warning!

Let me give you an idea of the effect of this bombardment.

Paul Roberts, one of the few journalists to escape the ‘embedding’ system imposed by the coalition military, travelled with Bedouins. He said, and I quote to you: “I experienced bombing in Cambodia, but it was nothing like that. There were three waves every night. After 20 minutes of this carpet-bombing, there would be a silence and you could hear the screaming of children and people. The survivors were walking round like zombies.”

This type of report was generally not published in the mainstream media, nor was the overwhelming evidence that - as in Vietnam, Serbia, Kosovo and Afghanistan - civilians were not mistakenly killed, but deliberately targeted.

The “war game” is very skilfully played. Let me show you another example.

Slide 26

What young person could resist this type of advert?



But does this woman really know what she is doing? I wonder if they ever show her the results of using the weapons?

I warn you here that the following slide is graphic and disturbing. You may wish to look away.

Slide 27 - The effects of war



These are photographs the Weapon Barons don't like the public to see. ²⁷

Slide 28 - Euphemisms

Using their well-known euphemisms, this is just "collateral damage" in the "theatre" of war.



TV Studio

A school

Their homes

Not satisfied with blowing Iraqis to pieces, the allies leave a continuing legacy of suffering and death behind in the form of a radioactive wasteland. ²⁸

Slide 29 – Robert Fisk

A few months ago, Television New Zealand gave an amazing interview to renowned journalist, Robert Fisk. In it, the interviewer, Kim Hill, asked: “Surely the Iraq people are now glad to be free of Saddam Hussein?” This was Robert Fisk’s response.



New Zealand Television (October 2005)

Journalist Robert Fisk posed a question:

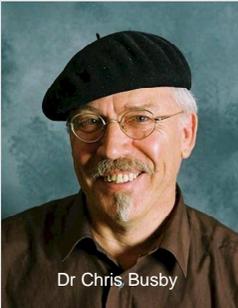
How would Iraqis rather live? Under a dictator, with power, water, food, schooling, healthcare and jobs, even if fearful of being taken for interrogation, or under an invading force, in what former Pentagon employee, Kurt Nimmo, describes as “a hell-hole of polluted drinking water, destroyed hospitals, intermittent electricity, sectarian violence, and Israeli-styled checkpoints situated on a landscape polluted with depleted uranium.”

This is Iraq today. 29



Slide 30 – Chris Busby

UK specialist, Dr Chris Busby, visited New Zealand and gave talks to both public and government ministers. We are still in contact and still fighting this battle. This slide shows what Chris found in Iraq.



Dr Chris Busby

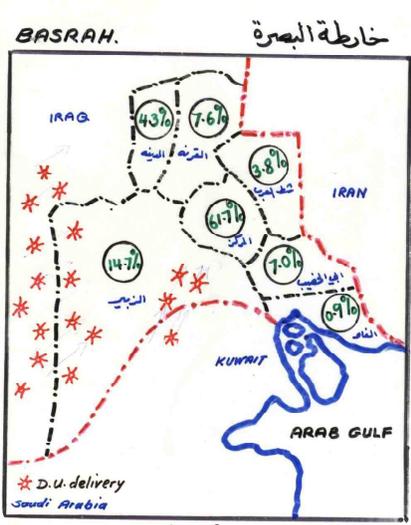


Fig1. Distribution of 5 common cancers.
(Data from Dr Jawad at Basrah Hospital, 2004).

Chris measured DU in Iraq in 2000 and in Kosovo in 2001. In both areas, it existed in the air as a kind of aerosol, a gas made up of sub-micron particles. It is inhaled by children playing nearby. What effects will it have later on these children or on adults?

Wearing NBC protection, Chris measured 5000Bq/Kg of DU beta emissions in dust in a park where children played. 30

Slide 31 – The three giants

Let's now look at who first exposed the truth about depleted uranium.

Three of the giants to whom we owe so much for exposing this dreadful crime are:



Dr Asaf Durakovic
US Army Colonel &
Chief of Nuclear
Medicine



Dr Doug Rokke
Former chief of
DU Project at
the Pentagon



Prof Siegwart-Horst
Günther ³¹

Probably the first to notice was Dr Siegwart-Horst Günther who had worked for years in Iraq's children's hospitals. Following the 1991 Gulf War, he encountered a rapid and alarming increase in cancers, especially rare and unusual cancers, and tied it to the use of depleted uranium weapons. He was so distressed by these effects that he aroused world attention in the film I mentioned earlier: "The doctor, the depleted uranium and the dying children." I recommend that you see this documentary.

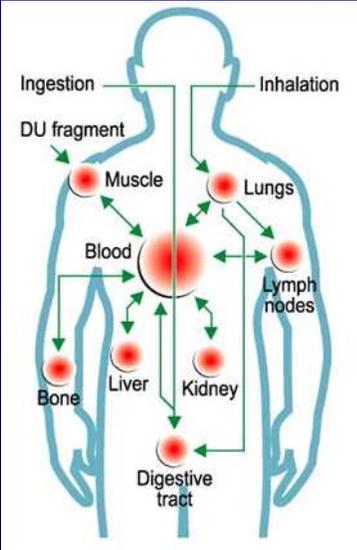
As well as Iraqi people being affected, British and US troops have returned home sick and dying. The authorities were dismissive, but, after continuing pressure, Dr Asaf Durakovic correctly diagnosed their condition as DU poisoning. The military refused any help to these troops.

Dr Durakovic was forced to leave the military when he refused to stop his DU investigations and had to go into hiding when his life was threatened. He was awarded the International Peace Prize in October 2004 for his work on the issue of DU and on the medical and environmental effects of nuclear weapons on the human habitat and biosphere; a prize sponsored by over 134 nations. Dr Durakovic donated the \$10,000 cash prize to the Uranium Medical Research Centre in Canada for its ongoing work on nuclear and radioactive warfare.

The US military has done little to help their veterans. It is estimated that 160,000 are permanently disabled and this number is growing.

Outspoken, Dr Doug Rokke, is also a whistleblower forced to leave the military. His house was broken into several times. He now lectures all over the world at DU and related conferences.

Slide 32 – How does DU affect people?



Where does DU go?

When it burns, DU forms uranium-oxide particles that are easily inhaled and rise in the heat to contaminate the world's atmosphere.

Once inhaled, depleted-uranium particles irradiate the internal organs and do irreparable damage. 32

A misconception purposely perpetrated is that, "Depleted uranium is an *alpha* emitter and alpha particles are the least penetrating type of radiation." Even though everything in that statement is 100 percent correct, it is a half-truth - the half the military would like you to believe.

Even external exposure to alpha radiation is not always harmless. For example, cataracts can be caused by exposure to alpha radiation. And, as I showed you previously, the nature of radioactive decay is such that the alpha or beta emission from a radioactive atom results in that atom being transformed into a different element. In this case, *daughter products* of thorium and then protactinium are formed. These emit β particles together with strong γ radiation.

Thus external exposure to depleted uranium entails exposure to alpha, beta *and* gamma radiation. Again, as I have shown you, although our skin blocks alpha particles, beta radiation and gamma radiation penetrate the outer skin layers and damage living tissue. Beta particles can penetrate up to 2 cm, while gamma radiation - through a process called the Compton effect - generates beta particle radiation all along its track through the body.

British corporal, Jenny More, suffered cancer of the lower organs and gave birth to a child with no eyes; this as a result of exposure to depleted uranium weapons. Although ingested uranium can be excreted from the body fairly rapidly, the minute ceramic DU particles that are breathed in settle deep in the lungs. From there, it is almost impossible to rid the body of this poison by coughing or normal excretory processes. Thus, essentially, the particle will remain forever, irradiating the body with dense radiation.

Slide 33 – Covering up

The Pentagon does all it possibly can to cover up the DU scandal.

Medical professionals in US hospitals and facilities treating returning soldiers have been threatened with \$10,000 fines or jail if they speak out about the soldiers' medical problems.

As Dr Leuren Moret said:

"In June 2003, the World Health Organization announced in a press release that global cancer rates will increase 50 percent by 2020. What else do they know that they aren't telling us? I know that depleted uranium is a death sentence . . . for all of us."



33

To me, it is unconscionable that soldiers and their wives are not informed of the grave dangers of working in areas where radioactive depleted uranium weapons have been deployed. The fact that the military and governments have blocked accountability at international and national levels is a disgrace. Large areas of our world, and atmosphere, are now being contaminated with DU dust. (Reference: Geoscientist, Dr Leuren Moret, 'Depleted Uranium – A scientific perspective.')

I was shocked when I read that New Zealand troops were being sent to clean up in Iraq and help restore normality following the Blair/Bush illegal, unprovoked war. Have New Zealand servicemen been fully warned of the dangers they may face from the radioactive uranium waste left behind from these hostilities? More to the point have their wives?

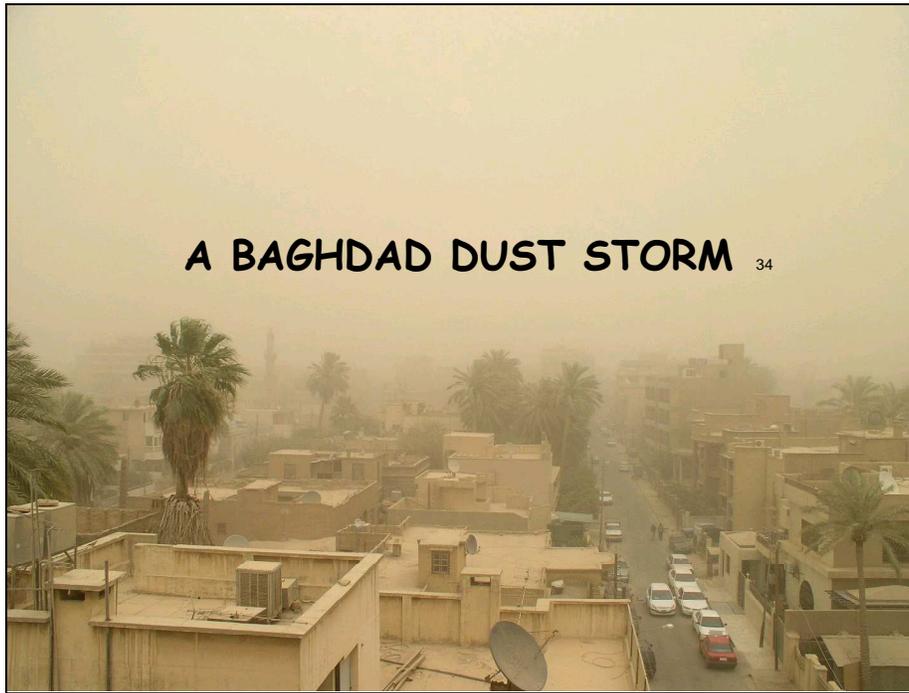
(N.B. In a written response from the then Minister for Defence, Phil Goff, I was assured the New Zealand government were monitoring the situation.)

The evidence is growing of damage to the spouses and genetic damage to the children of soldiers who have served in war zones since Desert Storm in 1990/1991. Yet, as with Agent-Orange and other military blunders, the Pentagon and UK government continue to deny that depleted uranium weaponry is highly dangerous, not only to an opposing force, but to their own troops.

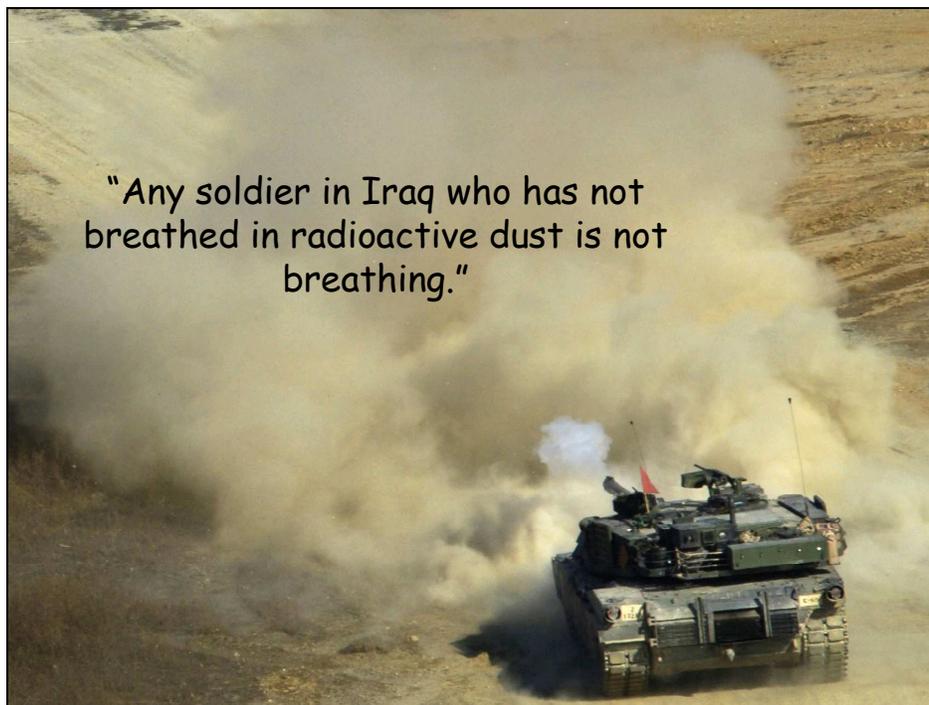
So let's look in a little more detail at the dangers.

Slide 34 – Dust storms

As said previously, when a depleted uranium weapon explodes, the heat created forms minute ceramic DU particles that escape into the atmosphere. Avoiding breathing them in is impossible, and the dust storms that frequent Iraq churn up contaminated dust and are almost impossible to avoid.



Slide 35



Slide 36 – An increase in lung cancer rates

Dr Mike Godfrey¹ and I received the emailed material in this slide from Dr Jim Howenstine in the US (6 April 2006, <http://www.newswithviews.com/Howenstine/james43.htm>).

An email from Dr James Howenstine, MD, 6 April 2006

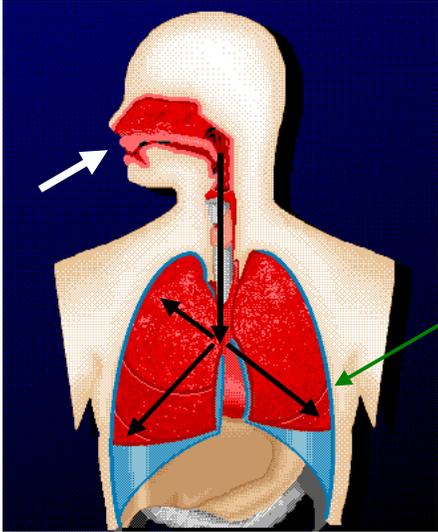
LUNG CANCER EPIDEMIC FROM DU HAS BEGUN IN US

In the year 2005, there were 175,000 new cases of lung cancer in the US. What has lead to this shocking new development?

Breathing radioactive particulate matter has long been known to cause lung cancer. Miners working in uranium mines, where radioactivity is an occupational hazard, have a high incidence of lung cancer. There is no way the human body can rid itself of the radioactive particles *in the lung* so the health damage is permanent.

We can expect lung cancer deaths to increase worldwide. ³⁵

Slide 37



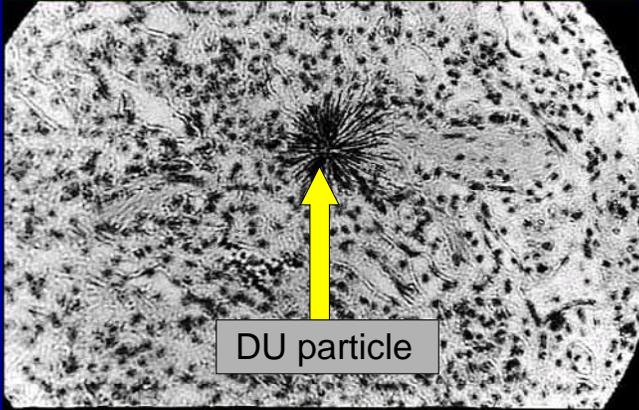
Passage of micro and nanodebris through the lung barrier.

These minute ceramic particles settle mainly in the alveoli where they remain to irradiate surrounding cells. ³⁶

¹ Medical Director, Bay of Plenty Environmental Health Centre, Tauranga, New Zealand.

Slide 38 – DU irradiation

A microscopic particle of DU irradiating surrounding tissues.



The image shows a microscopic view of a DU particle, which is a small, dark, spherical object. A yellow arrow points to the particle, and a label 'DU particle' is placed below it. The surrounding tissue is shown as a complex, textured network of fibers and cells.

The radioactivity persists for over 4.5 billion years, killing millions of every age for millennia to come. This is a crime against humanity which may rank with the worst atrocities of all time. ³⁷

Heavy alpha particles smash into nearby cells destroying DNA and forming other poisonous daughter products, which generate even more dangerous gamma radiation. These damaged cells travel through the body, lodging in other organs to become cancers. This is the major reason for the unique types of rare cancers found by Dr Günther in Iraq's children's hospitals.

Slide 39 – On the battlefield

DU on the battlefield has three major effects on living systems.

- * It is a heavy metal "chemical" poison.
- * It is a "radioactive" poison.
- * It has a "particulate" effect due to the very tiny size of the particles.

These particles are 0.1 microns and smaller. Cancer starts with one alpha particle under the right conditions. One gram of DU is the size of a full stop in this sentence and releases 12,000 alpha particles per second.

Many soldiers who had normal babies before the war, now find that their post-war babies are born with birth defects: missing brains, organs, legs and arms, and blood diseases. Iraq mothers now suffer the same effects according to Dr Gunther. ³⁸

Slide 40 – What is the effect on Iraq’s people?

In the words of renowned journalist, John Pilger, and cancer specialist, Dr Jawad Al-Ali...

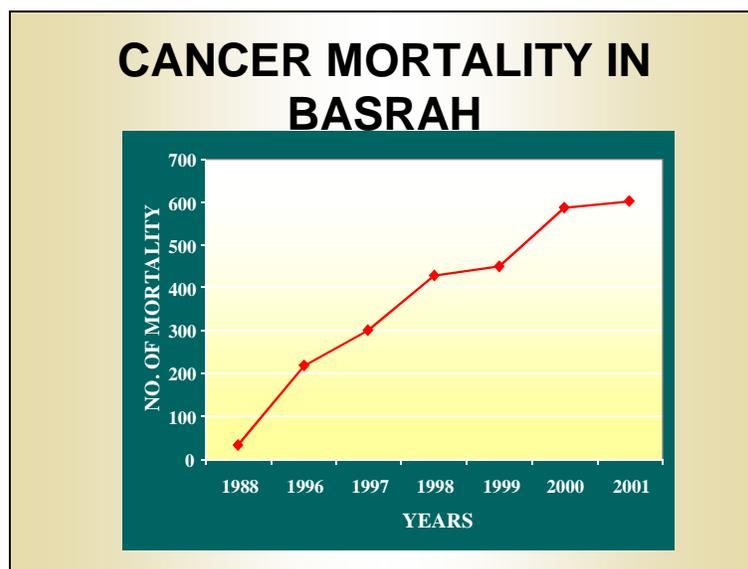
So what are the effects on the Iraqi people?

"In southern Iraq, the theoretical figure of '500,000 potential deaths' can be applied in a desert landscape where the dust gets in your eyes, nose and throat, swirling around people in the street and children in playgrounds."

"In Basra's hospitals, the cancer wards are overflowing. Before the (*first*) Gulf war, they did not exist. 'The dust carries death,' Dr Jawad Al-Ali, a cancer specialist and member of Britain's Royal College of Physicians, told me. 'Most of my own family now have cancer, and we have no history of the disease. It has spread to the medical staff of this hospital.'" 40

The deadly effects of depleted uranium have now been extensively documented by Dr Günther. The horrendous photographs of his patients have been posted on the Internet to alert people to the appalling legacy left by this illegal war. Invasion of these noble people has left an inexcusable legacy of suffering. It is truly heart-rending to see the sad condition these mothers now have to face. They no longer ask is it a boy or a girl, but is it normal? In some cases, the fathers, in their ignorance, blame the mothers for their deformities and abandon them with their children.

Slide 41



Be warned again, the following slide is graphic.

Slide 42 – Today, tomorrow and always

The death toll in Iraq, birth deformities among Iraqi children and the spread of all types of strange, unknown cancers, have reached catastrophic proportions.

Iraqi mothers no longer ask, "Is it a boy or girl?"
They just ask, "Is it normal?" ⁴⁴



The ongoing damage caused by depleted uranium, to today's children and to future generations, is unimaginable. This poisonous contamination is impossible to clean up. It will continue to irradiate the people of Iraq for ever ($T_{1/2} = 4.5$ billion years). It is nothing more than genocide on a grand scale and it is imperative that people world-wide do all that they can to stop the use of this vile form of warfare. The UN *Sub-commission on Prevention of Discrimination and Protection of Minorities* passed a resolution condemning the use of DU and certain other weapons during its 48th session in August of 1996. They urged all states to be guided in their national policies by the need to curb production and spread of weapons of mass destruction or with indiscriminate effect, in particular nuclear weapons, chemical weapons, fuel-air bombs, napalm, cluster bombs, biological weaponry and weaponry containing depleted uranium. ALL of the above banned weapons (bar biological as far as we know) were used on the Iraqi people. Since the first Gulf War, birth defects in Iraq have risen 300 percent and leukaemia 600 percent.

Slide 43

Iraqi mothers are not alone



Darrell Clark served as a paratrooper in Operation Desert Storm in 1991. Along with an estimated 45,000 of his comrades, Darrell has developed symptoms - in his case, asthma and recurring pneumonia - linked to 'Gulf War Syndrome.' And, like a growing number of Gulf War veterans, he has fathered a child with devastating birth defects. ⁴³

Slide 44 – Background radiation levels

In downtown, Baghdad, Tedd Weyman, director of the Uranium Medical Research Centre in Canada, measured radiation levels that were 1000 to 2000 times higher than normal background levels.

Dr Douglas Rokke, Major USAAF, Former chief of DU Project at the Pentagon, has said:

"Radioactive weapons used by the US and Britain rank among the worst crimes in the history of our world. Depleted uranium is the most toxic substance on the face of the earth with a half-life of 4.5 billion years.

These are crimes against humanity committed against Iraqis, Kosovars, Bosnians and Afghanis, especially woman and children. It is 'ethnic cleansing' as 'radioactive cleansing' ".⁴⁴

In fact, uranium is not the most toxic substance - plutonium is the most poisonous substance known to man. And, after researching the issue, I was appalled to discover that this was a contaminant found by independent scientists that carried out analysis on DU penetrators (Dr James Mc Laughlin, Department of Experimental Physics, University College, Ireland).

Again, the Pentagon denies that any plutonium can be found in depleted uranium material.

The essential point here, of course, is that we are now seriously threatening the survival of our species.

Slide 45 – Survival of our species

Threatening our survival

Nobel Prizwinner, Dr. Herman Muller has shown how the human race's continuous exposure to so-called "low-level" radiation is causing a gradual reduction in its ability to survive, as successive generations are genetically damaged.



"The spreading and accumulation of even tiny genetic mutations pass through family lines, provoking allergies, asthma, juvenile diabetes, hypertension, arthritis, high blood cholesterol conditions, and muscular and bone defects." 45

This issue has become an urgent global issue. We have to put pressure to stop the use of this dangerous material. As far as Iraqi children go, they have been abandoned.

Slide 46 - Sacrificed

Professor Sikora told Pilger:



©Takashi Morizumi

**Children of the Gulf War
Photo Exhibition**

Takashi Morizumi

"The saddest thing I saw in Iraq was children dying because there was no chemotherapy and no pain control.

"When I was there, they had a little bottle of aspirin pills to go round 200 patients." 46

Dr Sikora, was formerly chief of the World Health Organisation's cancer programme.

We should remember here the answer given by US Secretary of State, Madeline Albright, when asked whether the lives of half a million Iraqi children was a "price worth paying" to target Saddam Hussein. Her reply was, "We think the price was worth it."

Because the shortage of medicines is so critical most children - like Saafa above, an 8-year-old girl with leukaemia - are simply sent home to die.

DU Weaponry

* Violates all international treaties and agreements, Hague and Geneva war conventions, the 1925 Geneva gas protocol, US laws and military law.

* Since 1991, the US has released the radioactive equivalent of at least 400,000 Nagasaki bombs into the global atmosphere. That is 10 times the amount released during atmospheric testing, or the equivalent of 40,000 Hiroshima bombs. Dr Lauren Moret

The US has permanently contaminated our global atmosphere with radioactive pollution having a half-life of 4.5 billion years. 47

There seems little doubt that the military are prepared to sacrifice countless lives to protect their ‘silver bullet.’ Unless pressure is brought to bear worldwide, I have an uneasy feeling that we will see ever increasing horrors such as Iraq. We must do all that we can to bring this to the attention of governments and military personnel. Belgium has banned depleted uranium. Other countries could follow suit.

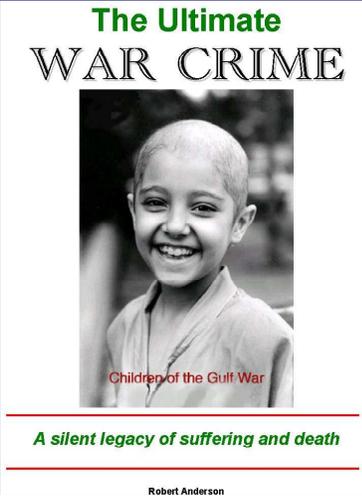
Quite apart from the deterring expense and danger of nuclear power plants, waste disposal will always pose major problems and tempt money- and power-makers into using it.

We would have done well to have taken the advice of an ancient people who know only too well the dangers of they call the “Yellow Emu Vomit” – Australian aborigines. They have more common sense than we do. As they told one journalist, “We, Aboriginal people, hold the key to survival on this land.”

Slide 48

In 2005, Robert Anderson published his book, *The Ultimate War Crime* (ISBN 0-473-10489-X). The cover featured Saafa. The profits from the book went to Iraq to be used in providing medicines for Iraqi children. It also helped raise awareness of the dangers of using depleted uranium.

Please note: this book is no longer in print.



**The Ultimate
WAR CRIME**

Children of the Gulf War

A silent legacy of suffering and death

Robert Anderson

Price only \$15

I sincerely hope that you will help us in this project.

All profits from the sale of this book are donated for medicines for Iraqi children.

The war in Iraqi has created an on-going legacy of suffering with thousands of children dying from cancers caused by DU contamination. Dr Amar, from the Hospital in Basra, said: "Two or three days ago, we had to cancel all surgery because we had no gauze and no anaesthetics. Our wards are like stables for horses, not humans."

PLEASE HELP 49

Slide 49

"Everything faded into mist,
The past was erased;
the erasure was forgotten.
The lie became the
truth..." George Orwell 1984

Thank you
for listening

Slide 50

Obviously, there is no humour to be had when covering such crimes against humanity, but I thought you may appreciate the following picture I received by e-mail from a journalist friend.

An email from an Iraqi journalist
Hi Bob, thought you may like to see what this little fellow thinks of em!



Here follows material that came to light after the presentation of this lecture.

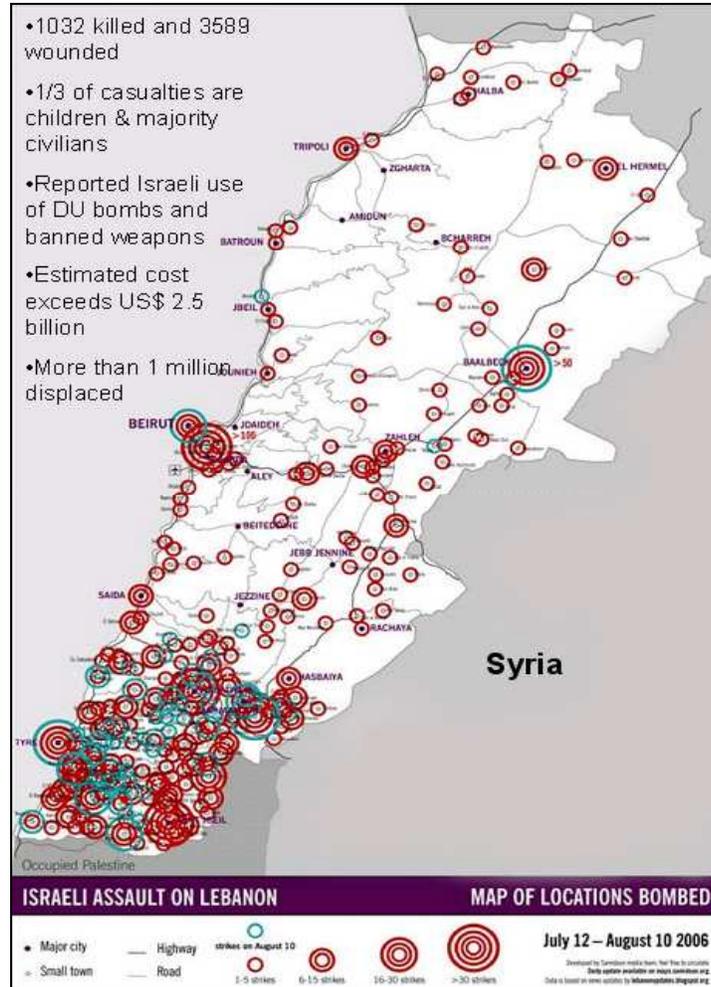
Warning reminder: some of the following pictures are graphic.

After writing my book, I was appalled to discover that US forces used mustard gas, nerve gas, and white phosphorus, together with Mark-77 or "improved" napalm, in Iraq. All these are banned chemical weapons.

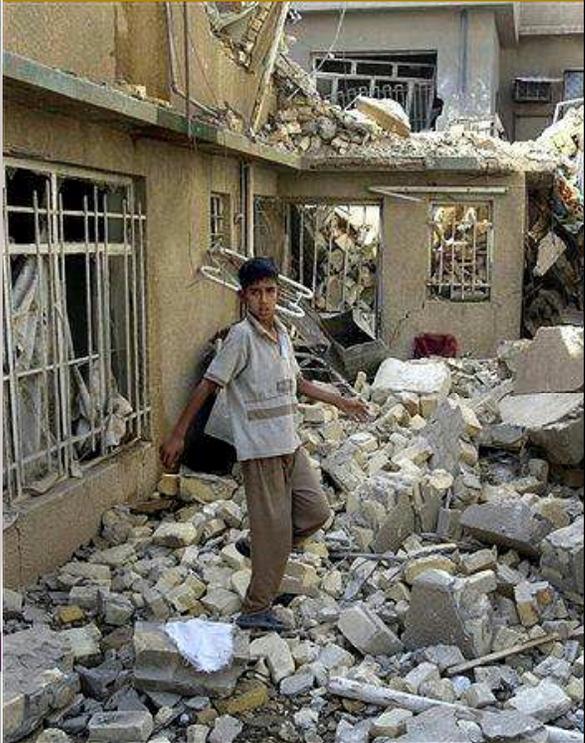
This was initially denied by the Pentagon, only to be verified from trusted and brave independent journalists such as Dahr Jamail and others not embedded with the military. This pulled the veil from one of the most carefully concealed secrets in the current US war in Iraq.



A US veteran of the Iraq war told *RAI News* correspondent, Sigfrido Ranucci: "I'm not supposed to tell you, but we used white phosphorus on Fallujah. In military slang, it is called 'Willy Pete.' Phosphorus burns the human body on contact - it even melts it right down to the bone. I have seen the burned bodies of women and children." 52



Depleted uranium weapons have now been used in Lebanon 55



And now the Horror of Palestine & Lebanon



The Pictures Bush & Blair don't have to see ⁵⁶

The massacre of Haditha



Although claiming these children were killed by a bomb when doctors examined them at the mortuary they were horrified to find they had been shot, mainly through the head. This was the massacre of Haditha.

300 children died every day

2000 "enemy" children died for every coalition soldier killed

Since the invasions 2 million of the Iraq holocaust victims have been children

Those dispensing death from the comfort of their computer screen will not be taking home the nightmare memory of Haditha and the rest of this illegal war ⁵⁷

Slide 55 - Where depleted uranium has been used

DEPLETED URANIUM

With another war in Iran imminent, scientists and others are expressing some grave concerns that the side effects of DU - still a major part of the US arsenal - will result in further serious illnesses and global contamination.

DU use worldwide

KEY:

- In combat
- ▲ Accidental use
- Past testing/training
- Current testing/training

Lingering effects
Nearly 12 years after the U.S. used DU on Iraqi forces retreating from Kuwait to Basra, the highway remains a radioactive toxic wasteland.

The map does not show key military bases where many larger US military divisions are based and where DU weapons are fired in training: places such as Fort Bragg and others too numerous to mention across the US. Nor does the map show the Mojave Desert where the armoured units train. Okinawa was a firing range for DU weapons. Afghanistan has not been included on this map. It is second only to Iraq in total tonnage of DU weapons used. It may have been targeted with Plutonium 239 warhead bombs. 60

Slide 56 – Websites

Some useful DU sites

Campaign Against Depleted Uranium: <http://www.cadu.org.uk/>
IDUST: <http://www.idust.net/index.htm>
Depleted Uranium Watch: <http://www.stopnato.org.uk/du-watch>
World Uranium Weapons Conference: <http://uraniumweaponsconference.de/>
The truth on Halliburton - www.halliburtonwatch.org
Pilger & Fisk on Iraq: www.commondreams.org/headlines03/0703-11.htm
Fisk says the story in Iraq journalists chose not to report was the "bomb now, die later" policy through use of depleted uranium (DU). Since the Gulf War of 1991, the number of cancer patients had risen and "strange vegetables" had begun to appear on the market. He says, the distortions were most likely to have been caused by use of DU.
Pilger on DU in Iraq: <http://www.sundayherald.com/27335>

See also International Physicians Against DU; International Physicians for the Prevention of Nuclear War; and The DU Education Project.

Information Update:

Belgium is the first country to enact a domestic ban on the use of uranium weapons following a unanimous vote in its parliament. The legislation was due to come into force on 21 June 2009, two years after it became law. In those two years, Belgium's Senate also banned all investments by government bodies and banks into the manufacturers of uranium weapons.

In Costa Rica, on mainland Central America, a proposed law that would ban the 'trade, production, distribution or storage' of uranium weapons has gained almost 40 signatories from 57 members of parliament. The same law proposal has been introduced to the Latin American parliament, Parlatino, where it may be used as a template for other nations in the region.

In 2009, Members of the Scottish Parliament have called for a global ban on the use of DU weapons. Scotland is home to the only British range where uranium weapons are tested, at Dundrennan in Dumfries and Galloway. The Ministry of Defence is believed to have fired 6000 DU shells into the Solway Firth, although the MoD is reluctant to provide or confirm details. The Campaign Against Depleted Uranium asserts that radioactivity levels in the soil at Dundrennan have breached agreed safety limits and that uranium contamination has been found in plants and earthworms. A MoD spokesperson has said: "We will continue to use these munitions in our tanks, which are legal under both UK and international law."

Sources: The *Friend*, 24 April 2009, www.thefriend.org; Peace Movement Aotearoa (PMA) New Zealand, www.converge.org.nz/pma/nionnz.htm; Belgian Coalition Stop Uranium Weapons; International Coalition to Ban Uranium Weapons.

In 2009, Australia approved the operation of the new Four Mile uranium mine lying north of Adelaide, owned by Quasar Resources. The mine will extract uranium a few kilometres from the Beverley mine, which expanded in 2008. The method used will be in-situ leaching, pumping sulphuric acid underground. This allows radioactive waste to be disposed of into groundwater.

The Australian Conservation Foundation says Quasar Resources is linked to US nuclear multinational, General Atomics. Four Mile mine is expected to begin operating in 2010.

Source: www.abc.net.au/news/stories/2009/07/15/2625957.htm, Greens savage Garrett over uranium mine, 15 July 2009. Also check out www.environment.gov.au/minister/garrett/2009/tr20090715.html on Four Mile.

In 2008, a company explored at Bokan Mountain on Prince of Wales Island, the site of Alaska's only uranium mine, which operated from 1957 to 1971; the uranium then purchased under contract by the US government. Landmark Alaska said there was potential to mine uranium and rare earth metals above Kendrick Bay, about 40 miles from Ketchikan, between 2011 and 2013. The US Geologic Survey estimates there could be 11 million more pounds of uranium at Bokan Mountain.

The Landmark Alaska Limited Partnership is the US subsidiary of Ucore Uranium Inc., a Canadian exploration company.

Source: www.adn.com/news/alaska/story/498073.html, Canada firm looks to reopen uranium mine, Associated Press, 19 August 2008.

Most US uranium ore is of a lower grade than that found in Australia and Canada. When uranium prices declined in the late 1970s/early 80s, mines closed because US deposits became uneconomic. By 2001, there were only three US uranium mines viable (in-situ leaching) in the US. Annual production was at an all time low in 2003. It doubled in 2006, from 10 mines. The US Department of Energy's Energy Information Administration said 90% came from in-situ leaching.

The US has the fourth-largest uranium resource, after behind Australia, Canada, and Kazakhstan.

In 2009, media reports claim the US would be expanding its uranium mining operations.

(Warren I Finch (2003) Uranium-fuel for nuclear energy 2002, US Geological Survey, Bulletin 2179-A.

Main source: http://en.wikipedia.org/wiki/Uranium_mining_in_the_United_States.)