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Making More Enemies than We Kill? Calculating U.S. Bomb Tonnages Dropped on Laos and Cambodia, and Weighing Their Implications

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Mondialisation.ca, 28 avril 2015
Asia-Pacific Journal

Région : South-East Asia

Debate over the nature and impact of civilian casualties from U.S. aerial attacks continues. "Are we creating more terrorists than we're killing?," Defense Secretary Donald Rumsfeld once asked of the U.S. invasion of Iraq.[1] The rise of Al Qaeda in Iraq and of its offshoot ISIS, suggests the answer there.[2] Reflecting in 2012 on U.S. drone strikes in Yemen, the former director of the CIA's Counter-Terrorism Center, Robert Greiner, wrote: "One wonders how many Yemenis may be moved in future to violent extremism in reaction to carelessly targeted missile strikes, and how many Yemeni militants with strictly local agendas will become dedicated enemies of the West in response to US military actions against them."[3] That same month a Yemeni lawyer warned: "DEAR OBAMA, when a U.S. drone missile kills a child in Yemen, the father will go to war with you, guaranteed. Nothing to do with Al Qaeda."[4]

In 2013 David Rohde of Reuters reported that "Drone strikes do kill senior militants at times, but using them excessively and keeping them secret sows anti-Americanism that jihadists use as a recruiting tool."[5] As discussion continued over "How Drones Create More Terrorists," Hassan Abbas remarked that in targeted areas, "Public outrage against drone strikes circuitously empowers terrorists."[6] The humanitarian impact and the political "blowback" can be serious — even from relatively restricted tactical air campaigns.

What of sustained strategic carpet bombing? Is there any correlation between bomb tonnage and political blowback? During World War Two, United States aircraft dropped 1.6 million tons of bombs in the European theater and approximately 500,000 tons in the Pacific theater. Some 160,000 tons of bombs fell on Japan, nearly all of it in the final six months of the war. Much of it targeted civilian industrial areas, beginning with the March 10, 1945 firebombing of Tokyo and including the atomic bombs dropped that August on the cities of Hiroshima and Nagasaki.

Decisive victory proved more elusive in regional conflicts of the postwar era, even when the U.S. continued to deploy massive bomb tonnages. During the Korean War of 1950-53, the U.S. dropped 635,000 tons of bombs and 32,000 tons of napalm, mostly on North Korea.[7] And from 1961 to 1972, American aircraft dropped approximately one million tons of bombs on North Vietnam, and much more on rural areas of South Vietnam — approximately

4 million tons of bombs, 400,000 tons of napalm, and 19 million gallons of herbicides.[8]

On a per capita basis, Laos, with its much smaller and dispersed population, may have suffered a yet higher rate of aerial bombardment during 1964-73 – "nearly a ton for every person in Laos," according to the *New York Times*.[9] The late Fred Branfman, who learned Lao and worked with refugees displaced in the country in 1967-69, was one of the first to publicize the human toll of that secret U.S. bombing, in his 1972 *Voices from the Plain of Jars: Life under an Air War*. Branfman's book was reprinted in 2013, with a foreword by Alfred W. McCoy that terms the Laos campaign "history's longest and largest air war."[10] Meanwhile in 2008, anthropologist Holly High even suggested that the estimated tonnage of U.S. bombs dropped on Laos during the Second Indochina War needed dramatic upward revision:

> The conventional history books usually place the total tonnage dropped over Laos at two million tonnes, making Laos the most heavily bombed nation on earth. This figure [. . . has] become iconic in describing the destruction and loss wrecked on Laos. However, this tonnage tally has only ever been an estimate . . . Currently emerging evidence suggests that the actual figure may be more than two and a half times this figure, some 5.7 million tonnes.[11]

However, six years later in the *Journal of Vietnamese Studies* (*JVS*), High revised back downward that suggested "actual figure" of 5.7 million tonnes of U.S. bombs dropped on Laos. She now confirms "the conventional figure of around two million tons.".[12]

During 2000-2010 various estimates, including ours, of the U.S. bombing tonnage dropped on Cambodia from 1969 to 1973 followed a trajectory similar to High's up-down estimates for Laos. And for similar reasons: the difficulties of technical analysis of the Pentagon's enormous but antiquated Southeast Asia bombing databases. In 1989 one of us (Kiernan) had published an article calculating a figure of 539,000 tons dropped on Cambodia.[13]But in 2000, just as High did for Laos eight years later, the *Phnom Penh Post* reported a new Cambodia total, a dramatic upward revision: "The [data] tapes show that 43,415 bombing raids were made on Cambodia dropping more than 2 million tons of bombs and other ordinance."[14] This figure had significant implications for the continuing work to clear the Cambodian countryside of the still widespread, deadly unexploded ordnance (UXO), as well as for a historical understanding of the wartime humanitarian and political impact of the US carpet bombings.

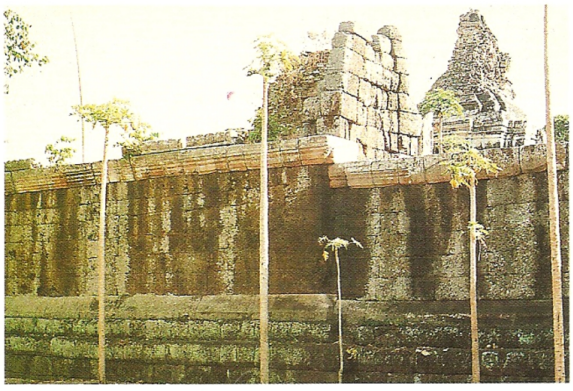
Our 2006 article, "Bombs over Cambodia," using the same database and analysis, calculated a figure of 2.7 million tons dropped on Cambodia in 1965-75.[15] Our estimate, published in the Canadian magazine *The Walrus*, and in 2007 in *The Asia-Pacific Journal*, was widely quoted.[16]

But in 2010 we corrected that estimate, here in *The Asia-Pacific Journal*. We revised it back down to around 500,000 tons.[17] In doing so we took account of the mistaken technical analysis that had impacted bombing tonnage estimates for both Laos and Cambodia. Holly High had written to Kiernan on January 4, 2010: "I have been working with computer scientists here at Sydney and we have managed to make a fairly responsive database and

also account for the anomalies in the data . . . The database covers all of Southeast Asia, and contains many more fields than the data that you were working with, from what I can tell from the data on the Cambodian Genocide Project website. It looks like the data you and others in the UXO business were provided with was a simplified, distilled version of the original SEADAB and CACTA files [combined Pentagon databases entitled "Records About Air Sorties Flown in Southeast Asia," and "Combat Air Activities"], sorted country by country so that each nation received only "its" records. The original database is much larger: indeed it is simply massive. It is also deeply flawed (some of the data appears to have been corrupted and there are omissions in certain months)."

Kiernan wrote back to High on January 18, 2010 stating that "we would urgently like to incorporate corrections of mistakes that were based on faulty Pentagon data, and show where that data is inaccurate. If it is okay with you, we would of course like to credit you and your skilled research assistant at Sydney Uni's Faculty of Information Technology, who has worked on this with you, for bringing the database errors to our attention. Obviously the sooner we correct those the better." In an email of March 1, 2010, High asserted that in the Pentagon's SEADAB database, the original entries for each sortie under the field of bombing "Load Weight" had been incorrectly keyed in, with a zero mistakenly added to each figure. Those bombing tonnages thus had to be divided by ten.

In June 2010, therefore, we published our downward correction of our 2006 estimate of 2.7 million tons. We stated that "this tonnage data may be incorrect. In new work using the original Air Force SEADAB and CACTA databases, Holly High and others have re-analyzed the total Cambodia tonnage figures and argue in a forthcoming article that the total tonnage dropped on Cambodia was at least 472,313 tons, or somewhat higher." We concluded: "It remains undisputed that in 1969-73 alone, around 500,000 tons of U.S. bombs fell on Cambodia."[18]



Angkor-era Khmer temple at Phnom Chisor, Takeo province, Cambodia. Photo: Ben Kiernan, 1988.

Now, in their *JVS* article published in 2014, High and two co-authors cite precisely that paragraph of ours.[19] But they neither quote from it nor reveal to readers the fact that in it – in 2010 – we had publicly revised our estimate back downward, and acknowledged their assistance in doing so. Instead, in 2014, incomprehensibly, they create the exact opposite impression: "Owen and Kiernan's revised figure [*sic*] is nearly five times higher than conventional estimates … Owen and Kiernan's reassessment of the air war over Cambodia has also been uncritically cited by a number of other scholars… The idea that Cambodia was the victim of 2.7 million tons of ordnance, rather than 0.5 million, is becoming the "new

normal" in Cambodian studies. This upward revision has serious implications for the reading of regional, military and global history."[20]

We of course find that statement surprising, given that in 2010 we actually wrote the opposite, as High knows. Not only from Kiernan's prior emails to her, but her note 26 specifically cites our "note 38" where, among other places in our 2010 publication, we advocated the figure of 500,000 tons. High's own 2008 exaggeration of the Laos bombing, at 5.7 million tonnes, was entirely understandable, but she has corrected that only in 2014.

The most important outstanding issue concerns public access to the different databases we all have been working on. For some years we have made our Cambodia bombing data files accessible through the Cambodian Genocide Program at Yale University.[21] On January 4, 2010, High had written to Kiernan: "I would be happy to help you access the database that we have created . . . Let me know if you would like to access this any time." Kiernan thanked her for that offer and posed several questions about the data. On January 28, she wrote again: "I think the best course of action is for James, Gareth and I to continue to finalize our piece of writing, and then share it with you when it is in a near final state (close to final draft)." Kiernan did not hear from High again, but on February 19, 2010, she kindly sent Owen a draft of "what I have written for Cambodia so far (work in progress!)." It included none of the assertions about us published in 2014, quoted above. Despite further requests, neither of us heard any more from High after June, 2010 – until March 2015, when the co-authored article published in *JVS* in 2014 first came to our attention.

In an email to Kiernan on January 7, 2010, High wrote that "the database is wildly inaccurate itself, if only because it was based on all-too-human data entry and was also subjected to falsification, as Shawcross notes [in his 1979 book *Sideshow*]. So I think the database probably underestimates the scale of the bombing, but the database itself can't tell us by how much or how to account for this." We suggest that High and her co-authors now make publicly accessible the database that is the subject of their 2014 *JVS* publication, as we did for our 2006 and 2010 articles.

In addition, in the interest of the full transparency of a process that is complex but historically important, the public record would also benefit from a more detailed accounting of how High and her colleagues processed the original data files they obtained. In what follows, we outline some of our exchanges with High because they document the research exercise at the core of the debate over the use of archived bombing data, and ultimately over the—by all accounts—massive bombardment of Cambodia.

Our work and that of High and her co-authors on this topic are based on data originally collected by the US government. The databases are huge, they represent what was at the time an unprecedented data collection effort, and they contain significant ambiguity concerning the collection methodology and the precise nature of the data fields. In order for these data to be analyzed, they had to be converted to modern database formats. In the version we and the *Phnom Penh Post* obtained for Cambodia, this had already been done. High and her colleagues, on the other hand, used the original archived data, and, working with computer scientists, conducted the data cleaning and conversion themselves. The version of the database that they built appears to be similar, but not identical, to the one we used for our analysis.

The insights that High and her co-authors drew from this process and shared with us in

email exchanges provided a substantial contribution to our understanding. Of particular relevance to our analysis, they found errors in what we read to be the total tonnage field in the Cambodia database. High detailed their analysis to us via email, and based on this we revised our tonnage figure downward. For example, on March 1, 2010, in response to our question about how they had derived their tonnage figures, High explained their procedures for each of the two Pentagon databases in turn.



Local farmers at Phnom Chisor in 1988 pointed out what they said was 1973 U.S. bomb damage to the historic site's modern Buddhist wat, still unrepaired in 1988. Photo: Ben Kiernan, 1988.

First, the CACTA database, High wrote, "contains the field 'LoadQuantity' which is composed of [three parts, namely] load delivered, jettisoned and returned. We made a sum ofjettisoned and returned[,] to calculate how many bombs were dropped. It also has a field labelled'Load Weight'. This lists the weight of each bomb, not the total of the load. It also has a field'number of aircraft'. We determined that the load quantity referred to the total of all the aircraft, noteach one."

"For SEADAB," she went on, "the sum is different. Its 'Load weight' column represents the total of all bombs for number of aircraft, so in effect the sum was already done for us. The only hitch was that all figures ended in zero!!! A very unlikely scenario. We did some checking and deduced that somehow, the entire field had been multiplied by ten. So we had to divide by ten to get the real figure. The figures produced have matched beautifully with other published figures, such as the tonnage reported for Linebacker II [the 1972 "Christmas bombing" of North Vietnam]."

This is a valuable insight into the nature of the database and the thoughtful analysis that High, Curran and Robinson have conducted. But it is simply a window into the process. We do not have access to the details of the process that they used to build their database, nor to the complete database on which they have made these final calculations. Without further information we do not know, for instance, why a zero erroneously added to each bombing load weight could have produced an approximately fivefold tonnage over-estimate (from c. 0.5 to 2.7 million tons), rather than a tenfold error. But we do have here a glimpse into some of the process of the data analysis that it would be valuable to have fully entered into the public record. This would allow us to compare the database they built with the one we used for our analysis, which to the best of our knowledge are similar in structure. To get this important historical analysis right, we ask High and her colleagues to release their database and more fully explain the process by which they created it from the Pentagon's original files.



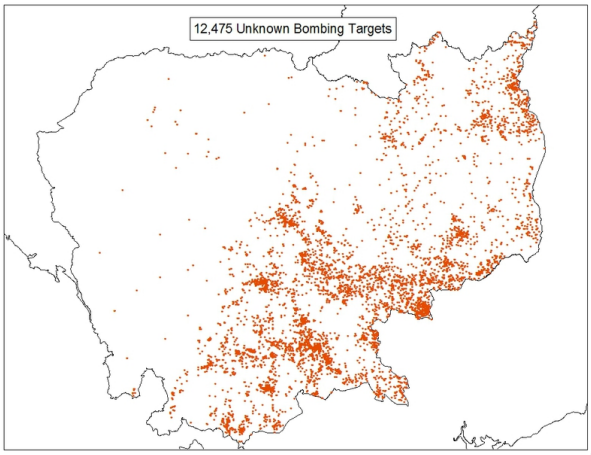
In 1988, farmers at Phnom Chisor pointed to an unexploded U.S. bomb still lying where it had fallen in 1973. Photo: Ben Kiernan, 1988.

The complexity of this technical discussion should not obscure the fact that, whatever the precise U.S. bombing tonnage dropped on Cambodia, it was massive. And as we have documented in three studies, much of it fell indiscriminately on populated rural areas. The bombardment's humanitarian and political effects are clear. We stand by the conclusions we have published on these issues over many years of research:

> "The evidence of survivors from many parts of [Cambodia] suggests that at least tens of thousands, probably in the range of 50,000 to 150,000 deaths, resulted from the US bombing campaigns . . . The Pol Pot leadership of the Khmer Rouge can in no way be exonerated from responsibility for committing genocide against their own people. But neither can Nixon or Kissinger escape judgement for their role in the slaughter that was a prelude to the genocide." (1989)[22]

> "The still-incomplete [Pentagon] database (it has several "dark" periods) reveals that . . . over 10 per cent of this bombing was indiscriminate, with 3,580 of the sites listed as having "unknown" targets and another 8,238 sites having no target listed at all ...The Cambodian bombing campaign had two unintended side effects that ultimately combined to produce the very domino effect that the Vietnam War was supposed to prevent. First, the bombing forced the Vietnamese Communists deeper and deeper into Cambodia, bringing them into greater contact with Khmer Rouge insurgents. Second, the bombs drove ordinary Cambodians into the arms of the Khmer Rouge, a group that seemed initially to have slim prospects of revolutionary success." (2006)[23]

> "Cambodia became in 1969-73 one of the most heavily-bombarded countries in history (along with North Korea, South Vietnam, and Laos).Then, in 1975-79, it suffered genocide at the hands of Pol Pot's Khmer Rouge communists, who had been military targets of the U.S. bombing but also became its political beneficiaries." (2010)[24]



Unknown US Bombing Targets, Cambodia

During the four years of United States B-52 bombardment of Cambodia from 1969 to 1973, the Khmer Rouge forces grew from possibly one thousand guerrillas to over 200,000 troops and militia.[25]

Writing about Yemen in 2013, Albert Hunt reported in the *New York Times* on a smaller-scale recurrence of such expansion: "There is much evidence . . . that the drone strikes are creating more terrorists. In a report this year for the Council on Foreign Relations, the national security scholar Micah Zenko said that in Yemen, the Pentagon had conducted dozens of drone strikes, killing more than 700 people. In 2009, the Obama administration said there were 'several hundred' Qaeda members in that country; by 2012, the group had 'a few thousand members'."[26]

Dropping vast tonnages of bombs has to be destructive, and carpet bombing can inflict comprehensive damage. But understanding the human toll requires study of the impact on people on the ground and, as Fred Branfman did in Laos over 45 years ago, listening to their voices. And understanding the political consequences requires taking account of their responses. Recruiters propagandizing among bombing victims have adopted varied political strategies, including genocide in the case of the Khmer Rouge, Al Qaeda, and ISIS. The question whether the United States "creates more terrorists than it kills" has not gone away.[27]

Ben Kiernan is the author of How Pol Pot Came to Power (1985), The Pol Pot Regime (1996), Blood and Soil: A World History of Genocide and Extermination from Sparta to Darfur (2007), *and* Genocide and Resistance in Southeast Asia (2008). *He is Whitney Griswold Professor of History and Chair of the Council on Southeast Asia Studies at Yale University.*

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Recommended citation: Ben Kiernan and Taylor Owen, « Making More Enemies than We Kill? Calculating U.S. Bomb Tonnages Dropped on Laos and Cambodia, and Weighing Their Implications », The Asia-Pacific Journal, *Vol. 13, Issue 16, No. 3, April 27, 2015.*

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Notes

[1] Albert R. Hunt, "Killing Terrorists, Creating More," *New York Times*, April 16, 2013(accessed April 25, 2015).

[2] The *New York Times* reports that by 2007, Al Qaeda "had taken control of several major cities and provinces" in Iraq. Michael S. Schmidt and Matt Apuzzo, "Petraeus Reaches Plea Deal…," March 4, 2015, p. A15.

[3] Robert Greiner, "Yemen and the US: Down a Familiar Path," *Al-Jazeera*, May 10, 2012, (accessed April 25, 2015)

[4] Ibrahim Monthana, "How Drones Help Al Qaeda," *New York Times*, June 13, 2012, (accessed April 25, 2015)

[5] David Rohde, "Obama's Overdue Step on Drones," Reuters, May 24, 2013, (accessed April 25, 2015)

[6] Hassan Abbas, *Atlantic*, August 23, 2013, (accessed April 25, 2015)

[7] Bruce Cumings, *The Korean War*, New York, Modern Library, 2010.

[8] James P. Harrison, "History's Heaviest Bombing," in *The Vietnam War: Vietnamese and American Perspectives*, ed. Jayne S. Werner and Luu Doan Huynh, Armonk, NY, M.E. Sharpe, 1993, 131-32.

[9] William Yardley, "Fred Branfman, Who Exposed Bombing of Laos, Dies at 72," New York Times, Oct. 6, 2014:(accessed April 25, 2015)

[10] Fred Branfman, *Voices from the Plain of Jars: Life under an Air War*, Madison, University of Wisconsin Press, 2013, xiii.

[11] Holly High, "Violent Landscape: Global Explosions and Lao Life-Worlds," *Global Environment* 1:1, 2008, 56-79, at 67, www.whp-journals.co.uk/GE/high.pdf. High cites her source in note 35: "John Dingley, Senior Technical Advisor at UXO Lao, personal communication. This figure is based on US Air Force data provided to UXO Lao. Unfortunately, the data has many errors, and exact figures are still unclear."

[12] Holly High, James R. Curran and Gareth Robinson, "Electronic Records of the Air War Over Southeast Asia: A Database Analysis," *Journal of Vietnamese Studies*, 8:4 (Fall 2013), pp. 86-124, at 104, 110. This article first appeared in 2014 here: note 26 cites a URL "accessed November 2013."

[13] Ben Kiernan, "The US Bombardment of Kampuchea, 1969-1973," *Vietnam Generation*, 1:1, Winter 1989, pp. 4-41, Table 1, p. 6:

[14] *Phnom Penh Post*, April 14, 2000.

[15] Taylor Owen and Ben Kiernan, "Bombs over Cambodia," *Walrus* magazine, October 2006, 62-69,

[16] Taylor Owen and Ben Kiernan, "Bombs Over Cambodia,"*Asia-Pacific Journal*, May 12, 2007:

[17] Ben Kiernan and Taylor Owen, "Roots of U.S. Troubles in Afghanistan: Civilian Bombing Casualties and the Cambodian Precedent," *The Asia-Pacific Journal*, *26-4-10,* June 28, 2010, box inset, and note 38:

[18] Kiernan and Owen, "Roots of U.S. Troubles in Afghanistan: Civilian Bombing Casualties and the Cambodian Precedent," *Asia-Pacific Journal*, June 28, 2010, note 38.

[19] High et al., "Electronic Records of the Air War," note 26.

[20] High et al., "Electronic Records of the Air War," 92.

[21] The CGP geographic data may be downloaded here .

[22] Kiernan, "US Bombardment," 32, 36.

[23] Owen and Kiernan, "Bombs over Cambodia," 62-3.

[24] Kiernan and Owen, "Roots of U.S. Troubles in Afghanistan,"

[25] Kiernan, "US Bombardment of Kampuchea," 6.

[26] Hunt, "Killing Terrorists, Creating More."

[27] "Jimmy Carter: Drones Create More Terrorists," *Huffington Post*, March 25, 2014, (accessed April 25, 2015).

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