

OPTION B

Before I start this essay, let me develop a disclaimer by reminding you of three facts that existed in December of 1939:

Fact number one – the world is at war.

Fact number two – Albert Einstein, representing all the United States physicists, has informed the President of the possibility of a super bomb – he stated the atom has been split, confirming $E = mc^2$, and Enrico is about to demonstrate a chain reaction at the University of Chicago.

Fact number three – all military historians agree that the army with the biggest weapons usually wins.

With these facts, Franklin in early 1940 authorized some funds to encourage this atom research. In 1942, based on an event the previous December in Hawaii and these same facts, he authorized unlimited funds for a secret program to produce this atom bomb – this program had the code name "Manhattan Project."

Either due to his own intuition or advice of others, the President knew that a) academic groups lacked the experience to be in charge of a project this large and b) if the government managed the project, it would be over budget and never complete; hence, the President contracted the DuPont

Company, with its vast explosive experience, to manage the Manhattan Project. Dr. Greenwalt, the President of the DuPont Company and a world famous hummingbird photographer, wrote the contract: actual cost plus \$1.00.

Since the initial work would be at the University of Chicago, the DuPont Company, to avoid putting strangers on campus, assigned only its employees with U. of Chicago degrees to this important project – just alumni returning to campus. My father was thus assigned to the Manhattan Project in mid-1942.

I remember real well the numerous trips my father made to the University of Chicago on the “Broadway Limited,” the world class overnight sleeper to Chicago operated by the Pennsylvania Railroad. When we took Dad to the Paoli, PA train station or met him on returning, we always enjoyed a 5-cent ice cream cone. To this day I do not know if these cones were on the expense account or if Dad paid for the ice cream. If on the expense account, let me thank the taxpayers – better a late thank you than no thank you. Actually, based on my meager inheritance, I believe Dad paid out of his pocket, but with aging I realize that fond memories are more important than money – if you learn nothing else from this essay tonight – learn that it is ok to spend your children’s inheritance .

After many trips to the U. of Chicago, my father was assigned to the Hanford Atomic Site in Washington State. I also remember the long hot trip through Indiana, Illinois, Iowa, etc. in late August from Delaware to Washington in our Ford. On this trip I, or rather my family, became famous. We were the only Delaware car to visit Yellowstone National Park in 1942, and I saw a bear. On this trip I also learned what hardships I was willing to suffer for the war cause. You see, when I complained about the hot car (pre-air conditioning), my mother told me it was necessary suffering to help the war effort. By the time we reached our destination I believed I had suffered enough to have won the war for the United States and its Allies.

During WWII, while my father worked at Hanford, I was searching for Indian arrowheads along the Columbia River and I also started my first business, a waste recycle business – buffalo chips were the only fertilizer available for the local victory gardens, and I was the supplier with my red wagon, at 10¢/load. I was earning \$1.00/day, I was a war profiteer. Some fifteen years later, my father, still working for the Atomic Energy Division of the Defense Department, was searching for arrowheads along the Savannah River while helping to develop that site.

This family history was mentioned so you would understand that a) we like finding arrowheads and thus often walk with our heads down and b)

we strongly support atomic technology. If in my essay tonight you think I am making fun of atomic technology, I am not – that's my disclaimer.

My essay tonight is not about my father, but is about my grandfather – not my biological grandfather, but my technical grandfather, Louis Fieser, the Harvard professor. You see, my major professor was William Johnson, so he is my technical father, but Bill's major professor was Dr. Fieser, so Fieser is my technical grandfather. I will not mention my technical great-grandfather so as not to have my diploma recalled by my Alma Mater.

As I look at the ages in the room tonight, I would bet that if you took a college chemistry course you used a book written by Fieser, who was considered one of the world's pre-eminent chemists as early as 1942. However, if you read Fieser's obituary you would be convinced that during WWII he must have been frustrated – here was the nation's best chemist, and he was not assigned to any war-related projects.

I met Louie several times, and I can assure you he was not frustrated during the war because he was assigned to several critical war projects, one of which I call Option B, which is the subject of this essay.

Option A for this essay is the Manhattan Project. Maybe I should have called Option B Option A, since it was the brainchild of Dr. A. – Lytle S. Adams, a dentist by profession, but an inventor by heart.

Adam's biggest invention as of late 1941 was an airmail pickup system where the planes did not have to land. This invention was the feature exhibit at the World's Fair in Chicago in 1934. Apparently Chicago is a feature city in this essay. This invention was commercialized in a partnership with Richard DuPont, of the Delaware DuPonts, at Tri State Aviation in my home town. As a result of this invention, Adams had become a good friend of Eleanor, who believed that this invention was better than sliced bread, and thus Dr. Adams knew Franklin quite well.

Option B starts on Dec. 7, 1941, the date that essentially made all Americans HATE Japan (I tried to find a stronger word than HATE for this essay), but any way to destroy Japan was suddenly acceptable.

On January 12, 1942, less than 6 weeks after Pearl, Dr. Adams wrote a letter entitled "Remember Pearl Harbor" to the President outlining his proposal to destroy Japan by fire. The proposal was rather simple: using vectors, put 100,000 incendiary devices into a Japanese city and let it burn – noting that so many fires could not be extinguished. Now Dr. A. knew that the vector for the biggest city fire in the US had been a Chicago cow, so naturally he considered using animals for his vectors. Despite his lack of knowledge of animal classification, I assumed Dr. Adams decided to select from the "ATS" group of animals – the most common members of this

group being cats, rats and bats.

We can guess why CATS were eliminated, and when you think about it, a fire in the top of a building is harder to detect and harder to fight than a fire in a basement, so we are not surprised that Adams in his letter to Franklin proposed BATS as his vectors.

In simplistic terms, the Doctor proposed arming bats with incendiary devices which will complete the fire triangle when they fly into Japanese cities: a) the oxygen is in the air; b) the fuel is the buildings made mostly of paper or wood; c) and the spark being the incendiary device. In one of the more colorful paragraphs in the Jan. 12 letter, Lyle pointed out that at last we know why God made bats – for the United States to use to destroy Japan. I must note that the dentist gave no consideration to the ethical issue of killing wildlife in his letter – where were the animal rights people in 1942.

I believe that Franklin was too busy to answer the Adams letter, so he sent it to the National Research Defense Commission for analysis with the words “this man is not a nut; it is worth looking into” – FDR. The conclusion of the Defense Commission can be summarized as “the individual elements, as crazy as they are, make fundamental sense.” An Army captain at Aberdeen Proving Grounds, a location next to Havre de Grace, MD, a feature city in my previous essay, did note that the incendiary

would have to be white phosphorus, which must be kept away from oxygen, but bats require oxygen to fly, so there is no way this proposal will work.

The "Go" for Option B came from the National Inventors Council on April 16, 1942 with Air Force encouragement and Army support.

These military connections were critical. On the positive side it meant that anyone working on this bat effort was in the armed service and thus not subject to the draft. This fact encouraged 5 young bat men to accept Dr.

Adams' offer to become members of the project now called the "Adams Team." On the negative side this military connection required:

- a) that the team members must take basic training on how to salute, etc.
- b) that the team would from time to time have to give "Dog and Pony Shows" to military brass and Dr. Adams didn't know what a "Dog and Pony Show" was – could he substitute bats?
- c) that the Adams Team would need more than military stripes on their sleeve to gain respect on their trips to Washington D.C. and Chicago, which would be many. What besides a chauffeured limousine would get them respect?

Despite the downsides, Dr. Adams and his five bat boys started to address the unknowns associated with using bats as vectors such as:

- are there enough of any single bat species – might need a million bats
- what is the carrying capacity of a bat – after all, a female bat carries her young until full grown so they can at least carry their own weight
- how do you attach an incendiary to a live bat – is this an engineer's type problem
- are bats located at one latitude and one longitude able to navigate at a different latitude and longitude – is this issue why there are so many bat species in the world – at least 64 known in 1942
- will bats hibernation habits limit their use – you think a little cold weather stopped Napoleon on his visit to Russia, think what might happen to your plans if your attack-force decides to hibernate
- how do bats respond after flying in an airplane

Another major issue unrelated to bats was where should the Adams Team have its home base. It needed an unlikely location for such a highly secret war project. This last issue was quickly resolved – space was available in Los Angeles on the grounds of a Down Syndrome

Clinic – this was the most perfect disguise for Option B.

The bat boys' research efforts were very productive – by June of 1942 they had done the following:

- first and foremost, they had captured a Mastiff bat, the biggest and ugliest bat in the U.S. and within a week had a pet that did a few tricks – they were ready for the “Dog and Pony Shows” for the bigwigs.
- second, they had determined that the Mexican Free-Tail bat was the most plentiful – many millions available in Texas caves. This meant that the project would not need Carlsbad, New Mexico caves, which were tourist attractions and tourists might blow the secret
- third, the carrying capacity of a Mexican Free-Tail bat was 15 grams
- and finally, fourth – they had forged letters of introduction about their secret mission which were designed to impress local police as the “Adams Team” drove their old Buick in strange places at strange speeds looking for bats – it should be noted that these letters did work, as the arresting officers always wished them “Godspeed” and often even gave them a red-light escort.

Now was the time to add more manpower to the "Adams Team." The first non-bat person was a craftsman to build the bomb. Due to the LA home base location, the craftsman that was selected worked for a company owned by Bing Crosby. Many people at this time believed the Hollywood connection was an attempt to give status to the team, but it wasn't – it was simply the best available craftsman. You see, Hollywood was not real busy as its actors had been drafted. Of course, the fact that the craftsman's shop was under the grandstand of Del Mar Horse Track did not compromise the secrecy of this project. My research shows that this craftsman's name was Andrew Stanley, so I assume he is related to the Stanley Tool Company – a company whose tools each of you have used.

The second non-bat member of the team needed to be an incendiary device expert – it so happened that Louis Fieser was not only the World's Expert on incendiary devices, he was also an expert on time control devices. This Harvard chemistry professor was known to be able to mix chemicals in such ways as to be able to start a fire at anyplace at any time. Hence Fieser was recruited and joined the team. Dr. Fieser brought with him William Young, a U. of California chemist, so two chemists were now on the team.

History does record the four-letter words exchanged between the bat boys and the chemists when the term grams rather than pounds was used for

the size of the incendiary device, but I cannot use those words in an essay before this group.

At this point Option B was just like Option A

- each was secret and had a code name – Adams Team, Manhattan Project
- each had military connections and manpower exempt from the draft – one in the Defense Department, the other with Army and Air Force connections
- both had unlimited manpower – one with over 200,000, the other less than one dozen
- both had sound financial backing – one the US tax-payer, the other Adams' personal bank account
- each had a major technical issue – one: is there such a thing as a chain reaction; the other: is there such a thing as a hibernation issue
- each had a Harvard man in a key technical position – one Robert Oppenheimer, a graduate and the other Louis Fieser, a professor.
- each was planning an initial test in New Mexico

- each lacked respect in Washington DC – one had no chauffeur or limo, the other was claimed by an important senator as the “crazy notion of making bombs from atoms.”
- both had the same object – burn the opponent’s cities to the ground to end the war
- each was the backup for the other.

There was a difference, however – option A had all the available engineers not in the armed forces, while option B had no engineers to solve the problem of how to attach the incendiary to the bat.

By late 1942, the “Adams Team” had

- a) lost even more respect as the tamed bat, named “flame thrower” after that terrible weapon, during a “Dog and Pony Show” landed on a colonel’s head and drew blood when the colonel tried to remove it.

BUT

- b) had gained some respect – they had rented a limousine and added a driver to the team with the name Patsy. Patsy’s language was that of a Chicago hood, so he had the respect of all the other chauffeurs in D.C. Patsy used words like rub-out, contract on him, hit man; he asked questions like – why do they not teach “street smarts” in

the universities, AND Patsy once told Fieser to his face "you don't know your ass from your egghead."

Actually, Patsy's language was not artificial, as he had been the driver for "Scarface" – alias Al Capone, when he ran Chicago.

If you were President Roosevelt in September 1942, you would have been able to determine which option would be successful in ending the war.

Consider the personnel:

Option A had Oppenheimer, Option B Fieser – 1 vote for Option A

Option A had Einstein, Option B Dr. Adams – another vote for

Option

A

Option A had Greenwalt/DuPont, Option B Crosby/Hollywood –

score one for Option B

Option A had Fermi, Option B Capone – the score is tied

Option A had Colonel Lester Groves as their "ace", but Option B had

Eleanor

So much for trying to be President Roosevelt – I know this audience knows which Option ended the war, so I will not pursue this line of reasoning any further

On December 2, 1942 (360 days after Pearl) the chain reaction was demonstrated under Stag Stadium by Fermi, so all Option A had to do now was to scale-up. It should be noted that the November 1942 issue of Harper Magazine contained an article entitled "One Way to Cripple Japan," written by Charles McNichols and Clayton Carus, neither of which knew of Adams or his proposal. This article mentions the congestion in typical Japanese cities – 3 million people in 500,000 buildings made of 80% combustible material – oil soaked paper, plywood and bamboo packed wall to wall, with a fire department capable of handling two fires at a time – with the conclusion that the cheapest possible way to cripple Japan and shorten the war was to use one bomber with conventional incendiary bombs. They also concluded it would save tens of thousands American lives.

Progress was rapid for the Adams team in this period. By February of '43 they had solved the bat hibernation questions. The literature was wrong – bats do not hibernate in cold weather. They do not fly from their caverns in the winter because they have migrated to warm caverns and if they are late migrating they just go inert on cold days until they are warmed up again, and they can go inert and reactivate themselves many times without apparent problems. So many of the bat concerns became moot. The plan was now catch the bat, inert the bat, attach the incendiary to the bat, put

bat into the bomb, drop the bomb (letting warm air rise as it falls slowly by parachute) the reactivated bats will disperse into the buildings, the buildings burn and the war ends. A little detail is the bats as they launch from the bomb will pull a pin that activates the time delay mechanism. Things are going so good on the chemistry side of the Adams Team that the National Defense Research Committee had placed Fieser's effort under their control – the word “control” is really their funding. This is now bona fide U.S. government research, but the bat boys are still being paid by Adams. This split funding could bring friction to the team.

A side benefit of knowing bats migrate is the realization that U.S. bats are at their maximum strength in September, ready to migrate or carry maximum load.

By May of 1943 the Adams Team was ready for a full flight test to confirm that the bat motel (bomb) as dropped from an airplane would function as designed – for example

- would the barometric device signal when the parachute would open
- would the jerk of the parachute separate the bomb's egg carton type trays, thus dumping the bats onto their launching platform

- would the bats when they start to fly really pull the pins that activate the incendiary time delay mechanism.

This, like many first tests, had a problem – to say the test was a disaster is to understate the situation – the slipstream from the plane tore the wooden bomb apart, so there was no barometric device to signal, etc.

Another test was quickly set up at a newly constructed Auxiliary Airbase near Carlsbad, New Mexico, which was to use a bomb made from metal, which Mr. Stanley was equally adept at doing, and the bats were loaded with inactive incendiary devices. Several other things about this test need to be noted.

- 1) the bats had been kept inert for 3 weeks to check the effects of extended inertness, three weeks being the time it might take to get the bombs loaded and into Japan Air Space.
- 2) the airbase commander, a colonel, was told to leave the base with all his officers and men – the secret test was taking no chances about leaks or spies.
- 3) an Army officer a rank lower than the colonel was placed in

- charge of the Airbase – you can feel the tension when an Air Force colonel is relieved by an Army officer of lower rank.
- 4) even the fire department was dismissed for this same reason by the Army officer.
 - 5) a small airplane was to follow the bomber to take pictures of the bomb dropping.

This critical Carlsbad test started in the morning, and was almost perfect – the bomb dropped, the parachute opened, the bombs' layers separated, the bats launched – but the wind was blowing, so the bats flew with the wind to the north, thus the bat boys had to ride across open land to confirm where the bats landed and how far they could fly. Sure enough, a ranch was in the wind's path, and the ranch cowboy appeared to object to this auto driving across his property – so again a colorful exchange took place, which I can share with you:

the bat boys in their uniforms say "We are from the Air Base – have you seen anything?"

the answer – "Like that damn noisy airplane?" (pointing to the small plane taking pictures)

the bat boys – "No, something smaller."

the cowboy – "maybe"

the bat boys – “anything unusual”

the cowboy – “like bats flying around – did you give them ‘No Doze’? They are in my barn.”

the bat boys – “can we depend on you not to tell the press?”

the cowboy – “sure! If you can get that airplane to stop spooking my livestock.”

Just think – as recently as 1943 the government did not have to pay money to keep people from talking to the press – just stop buzzing the livestock. I really believe he said “just tell the government to stop bugging me.”

Back to the test.

By early afternoon the weather forecast said no upper winds so the test was repeated without any hitches, all systems worked as designed, the bats behaved as predicted – total elation. But the photographer wanted some pictures of bats with activated incendiary devices. Six bats were thus activated. The photographer was slow. His lights warmed the bats. The bats flew again before the nets were put in place. Within 15 minutes the base buildings were burning from the top down.

The original site commander with his fire trucks saw the smoke and raced to the gate, but they were kept outside the gate. There is no

documentation of the scene at the gate – apparently it was so violent that the documentation was forbidden by the censors, but the fact that every building on the site burned to the ground was documented. Clearly sparks from the tops of some buildings landed on other buildings, otherwise how could 6 bats destroy more than 15 buildings? Neither the Adams team nor the National Research Defense Commission was ever billed for this air base destruction – a mystery, but the taxpayers somehow paid for this, I am sure.

This Carlsbad test confirmed:

- bats are easily awakened from inertness and retain their full strength even after a three week "inert rest."
- bats can survive without any adverse effects being at the 25,000 ft. height required for airplane delivery.
- the bat motel – when made of metal operates exactly as planned.

In other words, there were no more concerns about the bats – they would perform the vector function as planned. Note that it would be 1960 before the risk to humans from bat rabies would be understood, but no bat diseases were encountered on this project.

The only issue the bat boys suffered from working with bats was the odor of guano was always with them. This might explain why the girls in the small towns they visited showed no interest in them despite the fact that all

the other boys in the town were overseas.

At this point, the Marines took over the Adams Project. A major came out of retirement to be in charge. His first move was to rename the project "X-Ray" and very soon Adams was no longer part of the effort – no longer on any distribution list – essentially removed. It was noted that as long as Adams was on the project the name Colonel Edwin Aldrin also appeared – he was the father of the second man to walk on the moon – so maybe there is a Purdue University angle in this essay.

On December 6, 1943 (two years after Pearl) another test was made of the bats equipped with both the latest version of the incendiary device and the time delay mechanism. The conclusion of this test was a bomber loaded with the latest incendiary bombs would start between 167 and 400 fires, but a bomber loaded with bat x-ray bombs would start between 3625 and 4748 fires (note 4 significant figures), a 10/1 Bat Bomb Advantage, but the Bat Bombs' major advantage according to this conclusion is the placement of the fires. The Bat Bomb is an effective weapon – ready to deploy.

On February 10, 1944, an order for 1 million incendiary capsules with attached delay devices was signed with manufacture to begin on May 1, 1944. Note – this timing suggests a deployment in September '44, the month when the bats are at their peak strength. On February 14, 1944, the Bat

Bomb project, known as the X-ray Project, was officially discontinued – no reason was ever given.

Several reasons have been given over the years, such as:

- Option A was a superior munition; remember the country with the largest weapon usually wins the war.
- Adams was no longer around to finance part of the project and to keep Eleanor and Franklin as supporters.
- the ethics police considered a bat a biological weapon and under war rules it cannot be used.
- the social scientists did not believe the imperial empire would surrender if all we did was burn cities and not kill people.

History records that 1 year, 6 months and 2 days after February 14, 1944, Option A had a successful test which was followed 20 days later by the Enola Gay entering Japanese air space.

I do not believe it is worthwhile to even speculate how world history might have been changed if the low-tech Option B had been deployed in September of 1944.

I might note that if you do not believe a Harvard professor can give humorous lectures, you did not hear the Bat Bomb lecture by Louis Fieser.