Part 09 Harvard University

Harvard University

We're finally down to the center of our life in Boston, the reason that we even moved there, the lodestone on which all of our activities focused. Even though Harvard isn't showing up in this text until this point, Harvard was instantly the center of our universe when we arrived in Cambridge. It's impossible to introduce everything to you at once in a linear text.

Harvard is one of the highlights of my life. I've been a lot of places and done a lot of things, but Harvard... it's in a universe of its own. I didn't take classes there yet my association with Harvard was more organic in some ways than that of students. I was drawn into the fabric of the university through the back door, as it were. I was the child of a member of the faculty, and was actually employed by the university in various capacities over 4 years. I walked behind the scenes, entered libraries and exhibits through doorways not open to students, indeed, places that students weren't' even aware of. I got to use Weidner Library, the swimming pool, get into museums, and so on.

Here's it's logo. Isn't it gorgeous? It is Latin for "truth", split into three syllables, laid on top of three books. This was one of the premier universities in the US due principally to its age and the spectrum of well-known and well-heeled grads who exert invisible political clout and bestow financial largesse beyond what other universities can obtain. To even visit the Harvard Campus was to be impressed, to be persuaded that it was something above the average. It's "B" [Business] school was reputed to be the best at the time, and case study method utilizing small groups of students with real life cases was a model copied by other business schools. Its med school spread across an enviable set of hospitals including among others, Peter Bent Brigham, Women's Hospital, and Massachusetts General [Mass General] hospital. The Law School was highly respected as was its Divinity School. The faculty was comprised of stellar individuals who were widely published, respected and known. This quote from the Harvard website gives you a brief history of the university:

> "1636 Harvard College was established in 1636 by vote of the Great and General Court of Massachusetts Bay Colony, and was named for its first benefactor, John Harvard of Charlestown, a young minister who upon his death in

1638, left his library and half his estate to the new institution."

"Under Harvard President A. Lawrence Lowell (1909-33), the undergraduate course of study was redesigned to ensure students a liberal education through concentration in a single field with distribution of course requirements among other disciplines. Today, 51 fields of concentration are offered to Harvard College students. The tutorial system, also introduced by Lowell and still a distinctive feature of a Harvard education, offers undergraduates informal specialized instruction in their fields."

"One of Lowell's most significant accomplishments was the House Plan, which provides undergraduates with a small-college atmosphere within the larger university. After being housed in or near Harvard Yard during freshman year, students go to one of 12 Houses in which to live for the remainder of their undergraduate careers. (A 13th House is designed for nonresident students.) Each House has a resident master and a staff of tutors, as well as a dining hall and library, and maintains an active schedule of athletic, social, and cultural events."

(From Harvard website)

The life sciences are obviously the area dad was most involved with. Authorities and specialists in zoology, ornithology, herpetology, botany, paleontology and so on were attracted from Europe and other universities, like Alexander and Louis Agassiz, both of whom contributed in the 1800's to the development of the Museum of Comparative Zoology where dad took a job. He was a preparator in the Department of Vertebrate -as opposed to Invertebrate- Paleontology, in the Museum of Comparative Zoology, in Peabody Museum at Harvard University, a pretty heady string of designations for a high-school drop-out from the central Utah desert.

Dramatis Personae

Dad's professional life in Cambridge was peopled by a set of most remarkable people I had ever met. I was also affected by them during the I spent working at the museum, at parties and outings. This a list of most of the people in that group:

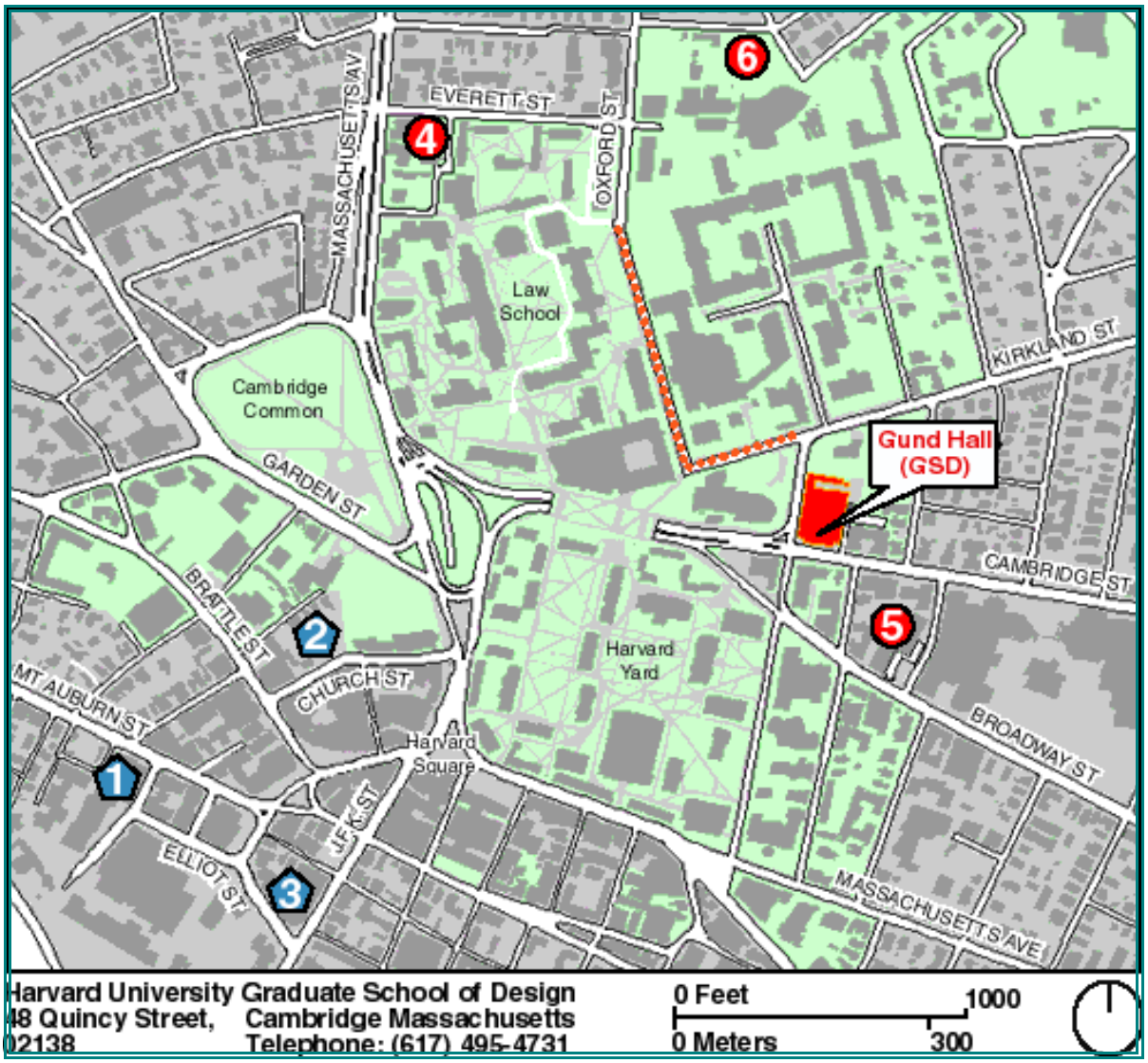
Alfred Sherwood Romer, Director of MCZ
Ruth Romer, Dr. Romer's wife
Nelda Wright, Dr. Romer's executive assistant
Arnie Lewis, dad's boss and friend and his wife Jane Lewis

Edith Scammon, old-maid millionaire botanist
Patterson, another self-made paleontologist
Tilly Edinger, Holocaust victim, Neuro-paleontologist
Liska (Elisabeth) Deichmann, Danish invertebrate paleontologist
Joe O'Leary, dad's long-time friend from Honolulu
Ernest Williams, herpetologist
Myvonwy Dick, ichthyologist
Ernst Meyr, German ornithologist (still alive in 2004)
Raymond Painter, Ph.D. (Liked to be 'doctored'), ornithologist
Henry Seton, millionaire dilettante
Ernst Maier of Hebrew University
Jack McIntosh, the sauropod man

These are the people I knew personally, worked for, talked to at clam bakes, dinner parties, or picnics, people that I corresponded with even while I was in Brasil and then Indiana. They stand out today for the variety of reasons that I'll explain when I introduce them below.

Physical Setting

This is a 2004 parking map from the Harvard website which gives you a clear overview of the campus:



The parts of Harvard University that we trafficked included the following:

Peabody Museum
- Museum of Ethnology
- Museum of Comparative Zoology ("MCZ")
  - Vertebrate Paleontology

Invertebrate Paleontology
Ichthyology
Herpetology
Botany
Blashka Flowers
Ornithology
Harvard Yard
Harvard Square
Weidner Library
Fogg Art Museum
Mem (Memorial) Hall
Swimming Pool
Administration Building (where I got my checks)
Soldier's Field stadium

There were even a set of streets that that stand out in this universe:

Oxford Street
Divinity Street
Mass (Massachusetts) Ave

Now I'll tell you how this bunch of people in these location affected my development, what I did at the different place, who I dealt with. I will organize these explanations on the basis of the people, introducing the places as appropriate.

Peabody Museum and MCZ

The Museum of Comparative Zoology, shortened to the acronym "MCZ", is located on Oxford Street down a few blocks from Memorial Hall, "Mem Hall" as it was called. It's hard to see but it appears in the above map. Find the **red "6"** near to top center and a short distance below it is a pair of gray boxes. Those boxes are the museum complex. Dad worked in the one on the left. He worked with Arnie Lewis in the Department of Vertebrate Paleontology. The preparation section that he went to each day was located in the "basement", actually more of a first floor because you entered it from ground level, but its decor suggested something subterranean. It was adjacent to large, dark, dusty storage rooms, filled

with plaster-jacketed specimens, unlabeled wooden cases, piles of paper and old books. The men's bathroom down the hall was filled with antique fixtures which were always clean but stained.

Peabody was constructed in the shape of an enormous horseshoe. While it had grown by accretion, the original style was preserved throughout. The building was constructed of brownish-red bricks and at the time many of the first two floors were generally covered with ancient ivy. The ivy was so old that it had wooden trunks 5 or 6 inches thick. I believe the ivy has been removed because it was destroying the mortar and weakening the walls. The windows on the first floor were covered by heavily re-painted screens made out of thin bars. I can't estimate the floor space of the building because it was huge, six stories tall, stretching perhaps 2 or more blocks in one direction and perhaps half that in the other. Because of the length of the legs of the horseshoe, passageways had been constructed through the buildings. Going through them was like going into a dark tunnel fringed around each end with ivy.

Figure 3 Harvard website

The large yard created in the center of this structure was criss-crossed by sidewalks and occasional benches, with a variety of ancient trees, maples, oaks, elms and beeches. In summer the yard was filled with students pretending to study but most seemed to be horsing around. This was the first place I saw a Frisbee, also called a "Pluto Platter" at the time, a sort of reference to flying saucers I suppose. Some of the early frisbees even had the signs of the zodiac on the top surface. The students were throwing one around and I was surprised at how smoothly it flew, appearing to sort of float. Harvard students being who they were

undertook to study frisbees, trying to figure out how they worked, why they had the characteristics they did, arguing loudly about the differential angular velocities of the rim versus the center to explain the unexplainable "lift" that held the thing in the air, and so on. I think that one group proved that it was impossible for frisbees to fly at all.

MCZ was just one of a variety of museums that constituted Peabody (pronounced "Pee-buh-d" with accent on the first syllable) Museum. Harvard being the venerable institution that it is, and as well-endowed as it is, possesses a wide range of museums but Peabody was the largest, hence most complex, hence interesting to a wide range of students and visitors.

In MCZ there was a huge stairway that extended from the top to the bottom floor. It was constructed entirely of metal, had a gentle slope and steps that were 15 or 20 feet wide. Looked like something one would expect to see in a palace or mansion. We used this stairway instead of the tiny slow old elevator - which required a key to operate. On the walls above the stairway were hung heads of animals, including the largest moose head I ever saw. About the time we were leaving, the museum began to go through some massive changes. One of the sad ones I was aware of what the removal and destruction of all of these preserved heads. That's called progress. The stairway was for staff and students so it was secured in public exhibition areas by metal screens.

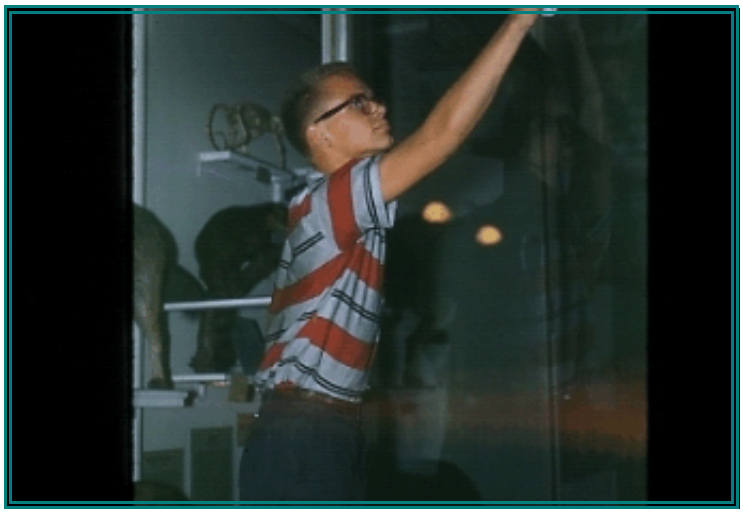
This is the parking lot circa 2004 which we parked in, little changed except for the white semi trailer:

Figure 4
http://www.mcz.harvard.edu/Departments/Herpetology/coll_renovation/

Cleaning Exhibit Cases - ornithology and African collection

One of the first jobs dad got for us at MCZ was cleaning exhibit cases in different parts of the museum. We didn't always work on the same jobs so didn't see each other during some days. The first job was a joint effort. We were hired to clean up after the displays had been refurbished in the public display section of birds. Dr. Raymond Painter was our "boss". These cases were of two sorts, one the wall-mounted variety, sort of built-in, the other was the free standing case. They were about 8 feet tall, so we needed step ladders to get to the top. There actually wasn't much debris because it had been generally cleaned up by the preparators, which means that our job was mostly the tedious task of using razor blades to remove paint that had lapped over onto the glass when the frames were painted, and then washing the windows. That is not a minor task when the panes were so large and so many.

Another summer I had a full-time job working on the top floor, in a sweaty hotbox below the roof, in the bird skeleton collection. At that time, Dick was down in the exhibit halls washing windows. The cases were probably 150 years old, consisting of glass on four sides as well as the top. The glass had to be cleaned both inside as well as outside so he had to climb inside of the cases and maneuver around the exhibits to finish the job. In some cases he had to actually move the exhibits from their normal position so he could get around them to the glass. One of the African animals that he had to move was larger than most so he had to push really hard to get it to move. Only after he heard the glass shattering on the floor did he understand that the difficulty was not the size of the animal, rather the fact that the animal's nose was pressed directly against the glass. It was hot sweaty work, there being no air conditioning in those days to deal with the 90% humidity and 90 degree heat.



Another job that lasted a few Saturdays was replenishing the moth crystals in the Gray bird skin collection, and then in the Gray collection of bird eggs. You

have no idea of the things we saw as we opened cases that hadn't been opened for many years in some cases, sliding out yard wide drawers and peeking inside. Just amazing. Bird skins of kinds I'd never heard of, large and small. And eggs? Whole drawers full of enormous, thick-walled ostrich eggs, etc. Just staggering. These collections extended from the floor to the ceiling around the many rooms dedicated to this particular collection, while the free-standing cases were about 8 feet high. Our assignment was simple: systematically go through every cupboard, cabinet, drawer, find the little dishes that had been used to hold moth crystals, and re-fill the dishes. Simple. Nothing to it. So we did that.

The interesting twist to the moth crystal was Raymond "Doctor" Painter, PhD's cupidity. Dick and I had spent some time searching for Sandwich glass with mom and dad. Everywhere we went, we stopped at junk shops and picked around for any sandwich glass initially, but then they decided they wanted to specialize in the pattern named "Paneled Thistle". We noted that many of these little flat dishes holding the moth crystals were obviously Sandwich glass, though we didn't know the pattern. In passing we mentioned to Raymond "Doctor" Painter that fact. He didn't show any particular interest, but we later discovered that he had been affected by it. On a later day as we worked in the collection, we noticed that there were no more Sandwich glass plates. That struck us as odd. They had been replaced with a modern substitute. Being naturally inquisitive, and suspicious, we went back to cases we had already completed. Sure enough, all of the Sandwich glass plates were replaced.

Looking back now, I am curious. Were these jobs at the museum ones that actually did come open during the course of museum operations? Or were they created as a result of dad's requesting any possible employment for his kids? At the time, they were work that I could do to earn some money. I resented being forced to do it but liked the money, and never thought about whether dad was arranging these for us or not. But it seems plausible that these little make-work jobs were just that. Dr. Romer liked dad and would have helped him this way. Nelda would know the MCZ well enough to come up with small tasks that teenagers could do.

Ethnology and Giant Gorilla

Dick and I worked in different parts of MCZ and roamed all of Peabody. My favorite part was actually not the paleontology part, though I obviously was linked

to it. It was the ethnographic section that fascinated me. This was located on the west limb of the horseshoe and possessed wonderful collections from around the world. The newest exhibit, prepared in a modern style, was most impressive. It was a set of rooms filled with carefully spaced Mayan statuary from the Yucatan. The walls were black and no overhead lighting was used. Instead, small narrowly focused spot lights were strategically placed around each exhibit to illuminate it and to dramatize it by patterns of shadows. In the case of the colossal heads the effect was impressive, creating a sense of foreboding grandeur.

My interest in anthropology was stoked by the massive collections that included a full range of artifacts of clothing, tools, weapons, and ceramics. Photographs provided additional insights about the people and culture. But of all the items on display only one gave me nightmares and I really don't know why.

It was on the sixth floor where some African exhibits were housed. In a back room there was an exhibit that was sort of out of place because it didn't reveal anything about the culture. The topic was big game hunting safaris. A set of photos showed kills of various large animals. One of the grinning hunters surrounded by the black bearers was none other than Teddy Roosevelt.

The shocking item was a huge glass jar in the center of the exhibit behind which was a set of mirrors to provide the viewer a 360 degree view. Of the largest gorilla head I have ever seen. A portrait of the kill that had the animal posed on his feet between the hunters revealed how enormous it was. It was an enormous silverback with forearms as large as the body of the hunters and a set of shoulders that looked 5 feet across. Sort of a mini-King-Kong. But it was the enormous head and human-like face in that jar that haunted me. It was horrifying and fascinating, drawing me back many times.

I discovered a couple of years ago that Michael Coe was doing his graduate work there while we were roaming the halls. His book about the decipherment of the Mayan hieroglyphics is as fascinating as Michael Ventris' "The Decipherment of Linear B". Maybe the name "Michael" is the key. You should read both if you have an interest in cryptology or simply an interest in some of the more difficult intellectual problems that the human mind has solved. The solution to the Mayan problem was actually predicted by the soviet Mayanist Khorozov?? who lived in St. Petersburg and never left his country. He suspected, rightly it turned out, that the Mayan system, like Egyptian hieroglyphics, consisted of 3 different kinds of symbols instead of one like the English system: alphabetic, syllabic and representational. The all-mighty somewhat arrogant American Mayanist Eric Thompson ridiculed the suggestion.

The other person of note today who was starting career at that time was ____. He
THE PANDA'S THUMB

Remodeling Storage Cases

Another job took several months to complete. Apparently MCZ had decided to remodel one of the collections, which one I don't recall. Understand these collections I'm referring to are those collections of fossils, skins, eggs, skulls, etc. stored in closets and cupboards, not those on display in glass cases. To accomplish the remodel, all of the trays on which specimens were stored had to be cut down and re-nailed together. Dad and his best friend at the time Arnie Lewis contracted to do the job, on Saturdays. And us two kids were hired on as common labors to do the running and handling and cleaning. It was saw-dusty work because they set up a table saw and ripped the trays lengthwise and across somehow, thereby producing large quantities of saw dust that went everywhere, giving us something to do when clean up time was there. We carried trays back and forth and scrap strips of wood. We were paid something like 35 cents and hour about 1958- which is about what minimum wage was at the time. The point: dad took us with him to do this work so taught by example with a few well chosen words you can be sure- which was a good thing after all.

Preparing bird Skeletons

The funnest job dad got me at Harvard was cleaning bird skeletons. I don't remember which summer it was but it was the summer when Phil Weitemeier**[**[1]**]** also from Belmont Highschool, was employed by another. He was a genius and his dad also worked at Harvard. His job was glueing together some sort of electronic gizmo that usually didn't turn out most of the time, but he was paid the same. He was a quiet guy, good quarter-miler.

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[1] This is bizarre. I managed to track Phil down last year. He's a big shot anthropologist at a university in England. When I emailed him, explaining who I was and indicating that I was writing to find out just what that job was, he replied, "What can I do for you?" That's a pretty clear message, isn't it. About the same I got from Phil Leonard 10 years ago. There's no going back to high school class mates, is there.

Anyway, dad managed to get me a job in the Gray Bird Collection at MCZ at Peabody Museum. Stuffy sounding place already, isn't it. My job was to literally clean and prepare for study skeletons which had been accumulating in the collection for 100 years. For that reason, I had the good fortune of being the person who actually was honored to clean and prepare the skeletons of the last two known living specimens of the "Passenger pigeon" Most of you youngsters don't know but it was somehow a significant specie to be decimated. They used to fly in such, large flocks that a single flock would block the sunlight for a full day during the migration season. That's a lot of birds. But easterners with shotguns full of bird shot brought them down in the thousands skinning and salting them in barrels for transport and sale in eastern seaboard markets. The net result was the actual total extermination of these lovely pigeons. And the last two known living specimens died and were bequeathed to the Gray Bird Collection.

Figure 6
http://www.princetonaudubon.com/WATERCOLORS/audubonwatercolorpassengerpigeon.

So I got to clean and prepare skeletons. Sound boring? Sound disgusting? Not for MOST of them. Because the methods I was taught to use were so varied, as varied as the condition of the specimens I had to prepare. In some cases I just picked the dried skin and tissue off the bones. Others I had to boil in a dilute solution of sodium hydrochloride, a base, to get the tissues to dissolve which created a pretty awful odor but nasal fatigue is a blessing and sets in about half an hour later. Then I would pull them off the burner, remove them from the boiling solution and cool them. The tissues would be softened to the point that they were actually more like jelly than tissue. I would remove this stuff and discover the bones below. The problem, obviously, was that one could cook the specimens so long that the cartilages were softened to the point that they could not be identified. That was a problem because the student depended on the shape of the cartilage for information to use in his study. I fear I did a bad job. Indeed, I know I did. I did the best I could under the circumstances but it was not good.

But I cleaned those passenger pigeons and was thrilled to do it. They even

came in their original skins and feathers so I could see what they more or less looked like. But in the end, they resembled ad number of other birds taken apart and stored in boxes after the tissue, skin and feathers were removed.

There were other equally important specimens I had to deal with and it was glorious for me. I understood enough about the environmental movement even then to know that it was an honor to be able to prepare the last specimens of a disappearing specimens. For example, I got to work on one of the last dodos. And I discovered that owls have bones in their eyes, circular bones called sclerotic rings shaped like truncated cones. Like ichthyosaurs had.

And that wood peckers have bones in their tongues, that are so long they curl all the way around the back of skull over the top ending not too far from the orbits.

Figure 7
http://www.talkorigins.org/faqs/woodpecker/woodpecker.html

I would sit up there on the sixth and top floor of the museum under the summer sun, 8 hours a day, having driven in with dad. There was no air conditioning so it was hot. But I was generally unsupervised so was able to do whatever I wanted to do, as long as it dealt with these skeletons.

There were two other methods of skeleton preparation that stand out.

One was the use of the bug room. The museum had a room filled with dermestids, tiny beetles that loved to eat dry dead tissues, even desiccated ones. These are the bugs that would eat my butterflies in cases if I didn't seal the cases tightly or use moth crystals. And since they only ate the tissues, not the cartilages or bones, they were ideal for preparing sensitive specimens. All one had to do was get permission first from someone and to then go through two small hermetically sealed entry rooms like compression chambers to gain entrance to the room where the nasty little creatures worked. They were less than a quarter inch long so were not visible. They lived in batts of cotton. So all one did to encourage them to do the work was to create a space on a work bench, lay the specimen down and just cover it with batts that contained these bugs. They went to work and laid eggs and joyfully devoured the dry tissue, though not very fast and reproduced. It took several weeks for them to finish their work but it was wonderful to behold so was worth the wait - if there was enough time to wait. Most of my things couldn't wait.

So I used another non-chemical technique to remove tissue from bones

called maceration. Outside of the museum, in the parking lot were dad parked the car was an outbuilding that I had a key to. It was a small brick building probably 10 x 16 feet and unheated and no one used it I would fill a large graduated cylinder - 3 or more litres- with water and drop a specimen into the water and carry it out to the house. I'd set it by other graduated cylinders containing other specimens. To ensure that the process would proceed as quickly as possible, I would pour a bit of the water from other nicely simmering specimens into the new cylinder. The purpose, obviously, was to inoculate the new water with the bacteria that had already set up housekeeping in the previous specimens. That accelerated the maceration process immensely. Every few days I would go out to the room and pour off the old tissue-fragment-filled water and replace it with fresh water. This speeded up the process and finally produced a jar of bones connected by cartilages and tendons that I took out and dried and then prepared for storage n the collection with proper labels in proper boxes.

Sometimes, however, this process did not work right. For reasons I don't know today, some of the specimens set up anaerobic rather than aerobic cultures - so I was told. I had no way to independently determine that. The result was that the organisms that were cultured had a totally different smell. Please understand, I was not a fan of the odors produced by the helpful aerobic cultures, but the scents produced by anaerobic bacteria were horrible. It smelled like something worse than dead and diseased. The aerobic cultures smelled sort of rich and full but these were skinny tight horrible putrid smells that turned one's stomach. So in the cases where the anaerobic bacteria set up housekeeping, I tried for another week to encourage aerobic maceration with inoculation of aerobic bacteria and if that failed, I would just revert to the sodium hydroxide solution. That always worked.

Another job Dick and I had at the museum, thanks to Dad, was cleaning the windows of the bird display cases after dad had completed his remodel of the displays. This meant opening the cases and using razor blades to scrape off the paint on the windows and picking up debris left behind in the cases. This wasn't hard work, but it was boring. The best part was listening to the moms and dads and kids talk about the exhibits. I don't remember any examples but I recall that some funny things were said. This was regular work on weekends that we earned money from. It was an ordeal getting paid, however. It seemed like one had to go at certain hours of one day a week to a particular building on the campus to a particular clerk at one counter where checks were issued. After waiting in line I would go up nervously to a counter in a high-ceilinged room where I announced my

name and collected the check for the last pay period. It was like I was stealing gold from God's treasury to get those old ugly women to hand the check across. Bookkeepers like librarians think they personally own the stuff they pass out.

We received shipments of specimens from Costa Rica. These were given to me to prepare which was interesting because they were basically fresh specimens. They obviously had been cleared by US Customs, but it was evident that the examination of the specimens had been cursory. Upon opening the cartons and sealed plastic bags I found several live tropical insects that would have been enthusiastically rejected by the Department of Agriculture. I was opening the cartons with Dr. Raymond Painter so he took the insects away. I don't know what he did with them but imagine that he took them down the halls to Entomology.

Cavident, Cavitron and Coprolites

There were actually two different experimental dental devices loaned to the paleontology section/MCZ to be tried out. I forget the name of the other, but it was a device that used ultrasonic waves to drill, an even more unpleasant way to make holes in teeth than the standard rotary bits. The Cavident was intriguing on the other hand, an equally useless bit of invention, but nonetheless interesting.

The Cavident that I got to use on a glass bottle employed a stream of high pressure, fine grained sand to etch whatever needed etching. The bottle was something to play with, and I did actually etch a hole completely through it. The hand piece was manipulated inside of a closed chamber in this situation, sort of an enclosed space to collect the spent dust and dislodged particles. Right there you have an idea about how useless the device would be in a real dentist's office where real people opened their mouths to allow the dentist to use this dust-producing device on real teeth. It was fun to do this and was an introduction to the concept of "sand blasting" that has so many uses in our country. For example, tomb stones are etched with a sand blaster. It uses a larger grit to be sure but the principle is the same. A paraffin wax coat is applied to the stone, the area that is to be engraved is carefully cut out and then the stone is blasted with high pressure grit long enough to etch out the shape and depth of shape that is desired. Industrial application range from simply cleaning a surface of whatever material was in place to other specific etching needs. It can be used to etch patterns in glass, though hydrofluoric pastes are probably simpler, using the same paraffin mask.

Harvard Square

There are two places called "Harvard Square" one is the yard encompassed by quadrangles of old multi-story dormitories that were taken over by various service or such and such groups. The other was the MTA subway stop names "Harvard Square."

Ushering Harvard Football Games

Through Belmont high school I also got a job in the fall being an usher at the home foot ball games for Harvard. That was sort of fun, sort of awful. Standing on the entries to different levels of the stadium in the cold wind to help people find their seats set one up for all sorts of responses. Some people were genuinely happy to receive an explanation of where their assigned seats were. Others were rude and nasty when we offered to help them find their seats, having been there for more years than I had been alive it seems. The pay checks were dispensed at the same mausoleum but I was real happy to get paid the $5 per game I earned. I did love it. Really.

Shells on the Charles River

Harvard has had a rowing club for generations as have all of the so-called Ivy League schools. There is a great deal of interest in this sport. It attracts blue-bloods and wealthy folk who consider this one of 'their' sports, like Polo and Lacrosse. At the time I was there, success on the river was greeted with as much as success on the 'gridiron', a good thing since the football team of all Ivy Leagues were pretty shabby when compared to the farm boys from Oklahoma and Nebraska. The cachet of sophistication stemmed I suppose from the fact that this sport was borrowed from England by the wealthy and the fact that most American universities didn't indulge.

These teams row in highly unstable light-weight boats called "shells". They are little more than a thin skin constructed to be just high enough to be not much wider than the rowers and to keep the rowers out of the water. They are constructed fo1, 2, 4, 6 and 8 wo/men teams. Here's an image of a 2-man boat on the Charles River, Harvard's home river. The building in the background is the Newell Boathouse where the Harvard boats and equipment are stored, and where there are rowing tanks for *in situ* practice.

Figure 8 http://hcs.harvard.edu/~harvcrew/Heavies/Images/newell1.jpg

This recent photo shows the refurbished Newell Boathouse after leaves have fallen. It is located on the Charles River across from the main campus.

Some of the snooty prep schools like Brown & Nichols also had rowing teams that even used the Charles River.

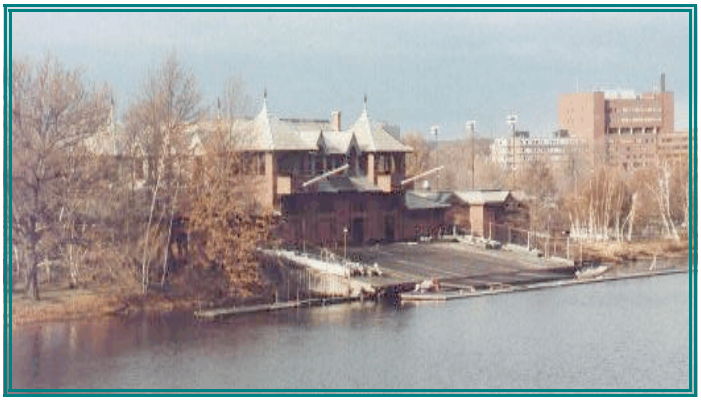
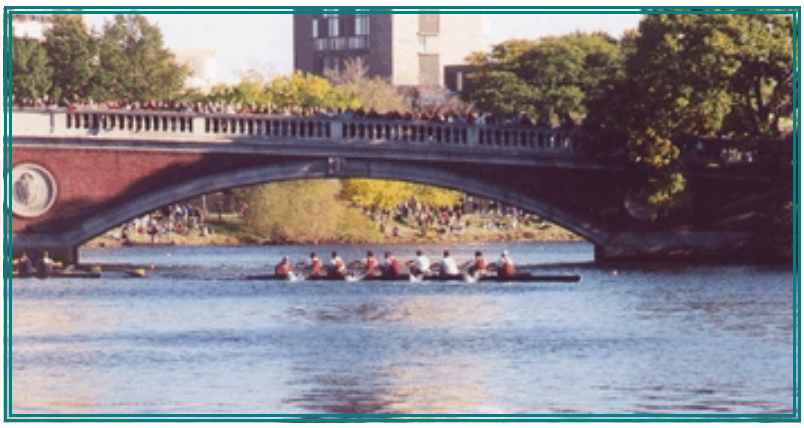


Figure 9 http://hcs.harvard.edu/~harvcrew/Heavies/Images/newell1.jpg

This map shows the Charles River as it passes through Cambridge on its way to Boston and the Atlantic on the right:

All of the violet blocks are Harvard Campus. The notation "Soldier's Field" designates Harvard's football stadium, shown elsewhere. Not that Mt. Auburn St. is close to the Charles. The LDS Church and Friend's Church on Longfellow Park is situated right between the '-n' of "Auburn" and the "S-" of "St." I don't remember whether Newell Boathouse is located in the violet block with Soldier's Field of the block to the right that is labeled "Harvard University". But it's along there.

This shows an 8-man shell on the River, headed downstream. There is a second shell on the left meaning this was taken during a competition which explains the masses of people lining the bridge. Similar aggregations of people are found along the river with picnics and wine when the weather is good as can be seen under neath the bridge. The bridge is called the Harvard Bridge, hence the concrete "Ve-Ri-Tas" shield on the left end of the bridge.



It is difficult to see in the preceding photo but if you look carefully, you count 9 people - in an "8-man shell". The ninth person is the coxswain, the only person in a boat who doesn't row and who obviously doesn't appear in smaller boats.

This image is a 1995 closeup of Harvard's "Varsity 8" in competition as shown by the crowds along the river. The coxswain is the stern looking at the rowers. This person's assignment is to beat out a rhythm that the rowers use to coordinate their strokes. The coxswain changes the beat as he deems necessary by the competition. Note that these guys all lift weights. Rowing is not for sissies.

You can see the outrigger oarlocks for the long oars. You can't see it but the rowers are sitting on light-weight seats that sit on rails in the bottom of the

boat. This allows them to flex their knees when the pull, so their legs as well as their arms are powering the oars. Practice is obviously crucial so there are stationary seats fixed over water tanks in the Newell Boathouse that the rowers sit in and practice to increase strength and to improve coordination.

Here is a final shot, the 96 Varsity 8 rowing against Princeton, that shows the beauty of the boat and crew. Note how low it sits in the water and the construction of the outboard oar locks:

Figure 13 http://hcs.harvard.edu/~harvcrew/Heavies/Images/96v-fr.jpg