These pictures were taken during the fall of 1964 on the farm of Adolph Rezac, northwest of Valparaiso, Nebraska, by members of the Lincoln Gem and Mineral Club. The Club in cooperation with the University of Nebraska State Museum undertook the excavation of the fossil remains of an extinct cretaceous-age plesiosaur.

"THE MONSTER DIG"

1 This is the story of PLEEZY. Pleezy was a plesiosaur who lived in the shallow sea which covered Nebraska and most of the southwest United States over one hundred and twenty million years ago during the cretaceous age. This slide is an artist's conception of what he must have looked like. We don't know too much about Pleezy or the other plesiosaurs which lived during his time other than what paleontologists have been able to surmise from the clues left by their remains for there is nothing that we know on earth today which remotely resembles him. We do know that Pleezy was only one of a number of different types of plesiosaur which swam in the seas during Jurasic and Cretaceous ages. Some had long necks, some had short ones. Some had heads which were longer than others. All of them however were marine reptiles which ate the flesh of the other marine life which was quite plentiful in those ancient seas. One thing we do know about Pleezy for sure. He died and sank to the bottom of the sea and was covered with mud, silt, and the remains of other creatures which died about the same time. As time passed layer after layer was built up on the bottom of the sea and compacted into what geologists call shale. The sea dried up and what was once sea bottom became part of the strata which underlies Nebraska today. To be more specific, the particular spot where Pleezy lay buried is a formation called Graneros Shale.

2 With the passage of time a creek cut a channel down through this formation and exposed part of Pleezy's skeleton on the steep slope of its bank. In the fall of 1963 a portion of this skeleton

was discovered by three geologists working on a soil survey along the banks of Oak Creek north and west of Valparaiso, Nebraska on the farm of Adolph Rezac.

3 Recognizing their find as something of possible importance these geologists reported their discovery to the Nebraska State Museum at the University in Lincoln. Funds and manpower were short at the Museum, however, so nothing was done at the time. About a year later this situation was brought to the attention of the Lincoln Gem and Mineral Club who decided to do something about it before further erosion of the creek bank destroyed this valuable specimen.

4 They contacted the Museum and colunteered their services as diggers if the Museum could provide some supervision to insure that the collection was done in a proper manner. Thus, the project which came to be known around the members of our club as "The Monster Dig" was begun. Little did we realize at the time that our club members would devote over 1000 total man hours to this job before Pleezy would be all plastered into casts and reposing in the Museum Laboratory awaiting preparation. Nor did we know that the digging, casting and removal to the lab would turn out to be only the first part of this project. We did know that we would have to work quickly however, for it was already the last part of October and winter sometimes comes early in Nebraska.

5 So, one bright sunny Saturday morning in late October, armed with shovels, knives, icepicks, brushes, scalpels, shellac, burlap, plaster and lots of enthusiasm, a small group of club members accompanied by one of the staff assistants from the Museum made their first trip to the site which would become known as "The Diggins". Here they found that Pleezy was lying in the shale about halfway up a very steep bank overlooking a shallow creek.

6 In this picture the bone runs in a line from the large piece in the foreground on the left center, straight across to the round bone in the background where the clay shale changes color. The bone in the foreground proved to be part of a limb bone, the small bones were pieces of girdle and paddles, the large bone in the rear is a vertebra.

7 They immediately went to work to uncover the line of bone which was exposed for a distance of about fifteen feet along the bank. More than once their work would be interrupted to make a rescuing grab of one of their fellow workers who lost his footing on the steep slope. Where the leaves appear at the bottom is the creek, full of leaves to be sure, but waiting there quitly to wet down anyone who stepped back to admire his work.

8 The work was slow and tedious, most of it done with small knives, scalpels and brushes. Here the field trip chairman of the club is shown carefully removing the surrounding shale. This is the same section of vertebra which was shown in one of the previous slides before the matrix was removed. Further digging disclosed that these vertebra were part of Pleezy's tail.

9 These bones were carefully uncovered and prepared for casting. Since this part had been exposed partially by erosion it had partially oxidized. This is a situation we did not have to contend with in the rest of the specimen.

10 This bone was then put in a cast. A cast is used to enclose the bone and surrounding matrix so that the specimen could be transported to the Museum Laboratory for further work with the least damage enroute.

11 Here one of our club members continues to uncover additional tail vertebrae as they went into the bank. The tail ended after a distance of three or four feet which many of us considered fortunate

for if Pleezy had had a longer tail we would have had to remove a large tree growing out of the bank above.

12 Larry Martin, the man designated by the Museum as our Supervisor, (we called him our Baby Sitter), then applied a cast to the tip of the tail. Larry proved to be much more than a Supervisor. He actually did as much of the physical labor as anyone in our club. This was a situation we could not tolerate, so by action of the Board of Directors he was made a member in full standing of the Lincoln Gem and Mineral Club.

13 Let's, pictorially, go through the process of preparing a specimen for transporting to the laboratory. This picture shows parts of two of Pleezy's paddles after the covering matrix has been carefully removed. The front edge of the bones prominent in the picture are part of the bones exposed by the creek, which were shown in a previous slide. These, however, did not show the effects of oxidation for some reason.

14 The next step involves coating the bone with a mixture of shellac and alcohol. This prevents oxidation. Fossil bones also have a tendency to be brittle and sometimes are quite soft. The shellac and alcohol help bond the bone together and act as a hardener. Any bone fragments which are still loose are then carefully glued back in place.

15 Once all of the shellac and glue are dry the matrix is cut away on all sides of the specimen and undercut very carefully, not enough to break it loose yet, but in such a manner that when the cast is applied it will hold matrix and bone tightly together.

16 Damp tissue paper or toweling is then placed over the bone. This keeps the plaster coating which comes next from coming in contact with the bone and fills in any low spots or holes where bone could jar loose during transportation. In this slide you

can see how the paper has been carefully placed around the bone. You can also see the undercutting in the foreground.

17 Finally the actual cast is made. This is done by dipping strips of burlap in a thin mixture of plaster and covering the entire surface both top and sides. Extreme care is taken so that the strips bond tightly all around the bone and matrix expecially in the area where the matrix was undercut. Once again this is to insure that no damage occurs during removal and transportation.

18 The end result is a plaster coating much like your doctor would apply to a broken arm or leg. Casting can be a messy job. It requires that you get your hands dirty, that is, if you can call white hands dirty. In any event, if you aren't careful, you can have plaster in many places you don't intend.

19 If the cast is very long as this one is, further rigidity is supplied by fastening a board or broomstick to the cast with several plaster soaked strips of burlap.

20 Once the cast has hardened the matrix below the cast is undercut further until the cast can be broken loose from the underlying matrix and rolled on its top. This is a ticklish process for if the matrix is not solidly encased by the cast, everything inside the cast can come falling out in your lap. Needless to say, something like this can be quite discouraging. It destroys all of your careful preparation and to say the least, presents quite a problem for the preparators back in the lab when they try to fit the mess back together. Fortunately we are not speaking from experience.

21 All that remains now is to transport the cast back to the lab. Did I say "All"? Some of these casts weighed several hundred pounds. The closest we could bring vehicles was about forty yards from the far side of the creek. Carrying that much weight on the level was

work enough, but down that steep bank, across the creek, and up the other side -- that was something else.

22 The worst part of the trip was up the far bank. The other side of the creek was not shale, it was of glacial origin and quite soft and fine. Steps were repeatedly cut to make the ascent easier, but did not last long in the fine soil.

23 Excavation continued along the bank uncovering a portion of girdle, most of a limb bone, a line of vertebral processes and finally several vertebrae and portions of several ribs. Here two of our youngest senior members are working carefully to expose vertebral processes. These were part of the original exposure on the bank.

24 This bone is the upper end of one of Pleezy's limb bones. The scalpel will give some idea of the size of this bone. At first we thought we only had a small portion of this bone. Later we discovered that almost all of the rest of the bone had been discovered at the bottom of the bank by the edge of the creek where erosion had carried it. It had been carefully preserved by one of the early visitors to the site, who had removed it so that it would not be lost due to high water.

25 By now we had uncovered a line of bone running almost completely across this picture. That serious looking gentleman at the bottom of the picture is our Club President, Tom Simmons. I don't know why the serious look on his face but from his position on the bank, it looks like he could be standing in the creek.

26 Here Pleezy played what some considered a dirty trick - he changed direction - straight back into the bank. For a while, excavation continued as before, uncovering vertebra after vertebra, all in a well preserved state and perfectly articulated. That

means the bone lay in the exact position it occupied when Pleezy was alive.

27 This is a state of affairs which does not commonly occur. Paleontologists are somewhat used to finding their specimens in an unrelated, scattered condition, much as if it had been the main course of a drunken barbecue held during a bad cyclone.

28 This slide shows the bones which appeared in the previous slide covered with damp tissue and ready for casting.

29 Here the same part of Pleezy is shown with the cast applied and drying. Before removal it would require bracing and further undercutting.

30 Now the digging began to take on a few monotonous aspects. It became obvious to some of us that we were now following Pleezy's neck. Consultations of some reference books on Plesiosaurs revealed that some plesiosaurs had necks nearly twenty feet long.

31 But monotonous or not each section was carefully prepared and cast in sections from three to five feet long and tenderly transported back to the Museum.

32 Soon it became obvious that there would be a lot of manual labor still to come, for Pleezy was now covered by about nine feet of overburden and the farther back into the bank he went, the higher this covering became.

33 While work was still being done from the bank side a number of our members started removing the overburden from the top. At first we tried it the hard way, we traded scalpels and knives for picks and shovels.

34 Although this looks like clay it was hard dry shale and progress was quite slow. Enthusiasm was still at a peak as usual and volunteers were plentiful. But even with numerous diggers progress was slow.

35 Even the ladies took their turn on the shovel. Here one of our feminine members was caught by the camera taking her turn in the slowly descending trench.

36 But after considerable effort we were successful in digging a trench about ten feet into the bank over the spot where we thought Pleezy lay. By this time the amount of dirt we had removed had made us a nice ledge to walk on. Gone was the danger of a single mis-step landing you in the creek.

37 The bone was carefully exposed at the bottom of the trench, cast and removed. Working in the trench proved to be a slow process. The trench was very narrow and allowed very few members to work at the same time. Now the calendar began to be of some concern to us. Our present rate of excavation might result in spending the Christmas and New Year's Holiday Season at the 'Diggins' which just didn't quite fit in with most of our Holiday plans. So, we raided the Club Treasury for a few dollars to hire some mechanical aid.

38 Hiring it and getting it to where we wanted to use it, proved to be two different things. The steep creek banks prevented access on one side and the other side was a very steep hill which made descent by any type of machinery hazardous, to say the least. Shortly after this picture was taken the operator was unable to control his further descent and came bouncing down the hill in a very unconventional manner to say the least.

39 But get it down he did, and put it to use we did. Here Gene Rezac, oldest son of Adolph Rezac, who owned the land where we were digging, is shown operating the front end loader which we used.

40 In short order what was once overburden covering Pleezy was a huge mound of shale piled neatly out of the way. Regretfully,

even mechanical help has its short comings, when digging fossils. You can only safely go so far with a machine.

41 In our case we had to stop about three feet above Pleezy. The rest of the work was done by hand. So our members stopped watching the machine and again turned to the picks and shovels.

42 There was more of the work with small tools also. Here two of our gals remove matrix from the last couple of feet in the trench. We had left this covered so that no damage would be done to the specimen by falling debris during operation of the machine.

43 You can see that there was still plenty of overburden to remove even after all the digging by the tractor. And for some reason the matrix began to get increasingly harder to remove. So far things had been progressing almost too nicely, just to complicate things at this point Mother Nature stepped in - - -

44 Winter reared its ugly head in the form of cold weather - - six degrees above zero to be exact. This slide pictures a frozen seepage spring several yards upstream of the 'diggins'. What appears to be water in the lower right corner is actually 'mirror smooth ice' several inches thick.

45 The cold complicated things a little bit. Water to mix plaster now had to be heated so the plaster would set. But this shortened the setting time so much that the workers making the cast had to work quickly so they didn't wind up with a bucket full of hard plaster.

46 In order to shut out the cold wind which whistled in through the trench and up the backs of the diggers, plastic was used to cover the opening and anchored with rock.

47 Plastic was also placed over the top of the tractor's excavation and buckets of hot coals from the fire were placed close to the workers to provide warmth.

48 Coffee consumption more than doubled and several Junior members almost exhausted themselves keeping wood on hand for the fire, but the digging continued.

49 Finally the end was in sight. We reached the base of the skull. Here Dr. C. Bertrand Schultz, Curator of the Museum, is carefully exposing the thin bones of the head.

50 At this spot the surrounding shale was extremely hard and tough to remove. It took more than two days of careful digging to prepare this final section for casting.

51 But the final cast was finally completed and loaded for transportation back to the lab. For this job various vehicles belonging to our members were utilized.

52 Before we finally leave the field, I think we should mention our guests. Several hundred spectators visited the 'Diggins' during our activities there. They came by car, by truck and even a few on horseback.

53 In fact the spectators became so numerous at times that we were forced to exile them to the far bank of the creek, where we constructed a bulletin board and stationed several members to answer questions. Our activities were well publicized, by television, radio and newspapers. This project seemed to have caught the interest of the public. At least the newspapers seemed to think so for we had large spreads on the front page four days in a row during the last part of the excavation, just before Thanksgiving. All of this publicity caused Dr. Schultz to send out an S.O.S. Museum attendance during Thanksgiving vacation increased more than fifty per cent and he was receiving numerous

phone calls asking when they would be able to see Pleezy. With only two full time preparators on his staff, it normally takes at least several months to prepare a specimen the size of this one.

54 As a result we were asked to put on our aprons and help with the preparation. It was decided that in the interest of time and because of lack of available space for a permanent display of his entire forty one feet, that a temporary display would be made. The process of preparation went something like this.

55 First excess matrix was removed from the back of the cast. Then this was plastered shut and braced with a stout piece of board. Then the cast was turned over so that it was in the original position that it was in when the plaster was applied in the field, that is bone side up. The cast was then sawed carefully, completely around the sides and the top removed.

56 If a free standing mount is to be made the bone is then removed carefully by cutting all of the matrix away to completely free the bone. In our case however, it was decided that Pleezy would be displayed lying on the floor with only one side of the bones exposed to view. This made preparation much easier and shorter.

57 First the matrix was carefully removed with scalpels, disecting needles, and similar small tools. The bone was given a good dose of shellac, acetone and alcohol mixture to preserve and harden it further. Then any loose bone was carefully glued back in place.

58 This process was a very exacting one. By now most of the moisture present in the shale while it was in the field had dried out leaving the matrix very hard. The bone was very brittle also, so great care had to be taken not to damage it.

Any piece of it, even of the smallest size had to be carefully glued back in place if it came loose.

59 Even some of our Junior members participated in the preparation of Pleezy. This fourteen year old Junior member turned out work on the par with the best of us.

60 The man with the happy smile is Hal DeGraw of the Nebraska Geological Survey, one of the three original discoverers of Pleezy. Here he observes his discovery well on its way to becoming a Museum display.

61 Not all of the casts taken from the field contained bones from Pleezy. This cast contained portions of jaw bones and teeth and vertebra of a Cretaceous fish believed to be a PORTHEUS. This fish is somewhat similar to our present day 'Tarpon'. These bones were located in the bank approximately three feet above the spot where we excavated Pleezy's tail. Other bones found in the bank have caused our Club and the Museum to plan additional trips to this area.

62 Here Dr. Schultz finds time in his busy schedule to spend some time with our Club members in the lab.

63 Even in the laboratory, public interest could not be denied and the Press was allowed to come and record the proceedings for their various media. Once again we found our activities on the TV, radio and the front page of the newspaper.

64 Finally enough of the various parts of Pleezy were prepared to enable an adequate display to be put on public view at the Museum. All of the matrix had been removed from one side. He was well shellacked and the ends of the casts had been trimmed so that we would be able to fit the bones together in exactly the same position in which they were found in the field. Pleezy was ready to take his place in the Museum.

65 Before we move to the Museum with Pleezy let's take a look at one cast as it was when it was first opened in the Lab. This is Pleezy's skull, the last cast we removed from the field. Only enough of it had been uncovered to enable us to determine the outline and insure that all of it was in the cast. You can see that there is still quite a bit of matrix covering.

66 Now the same cast as it lay on display in the Museum. This side view of Pleezy's skull and jaw bone are enough to convince me that I'm glad he is extinct for I wouldn't want something with teeth like that paddling around today. I might give up swimming for good.

67 The perfect articulation of the neck bones and skull is quite apparent here.

68 Notice the small size of the vertebra and processes compared to those which appear in the next picture which was taken further down the neck.

69 The further down the neck we go the larger the processes and vertebrae become. With over 60 vertebrae in the neck alone, the last few become quite large.

70 In this slide you can see a change in the shape of the top of the vertebra processes. Now they are almost square on top -- not somewhat pointed as they are nearer the head.

71 Remember the paddle when we went through the process of making a cast in the field. Here is the final product on display in the Museum.

72 This, our final slide shows Pleezy as you would see him when you visit Morrill Hall, the University of Nebraska State Museum in Lincoln. The other visible specimen is one of two carnivorous dinosaurs called Allosaurus obtained by the Museum in Utah through the generous donations of Walter Behlen, one of

the Museum's benefactors. Pleezy will be on display in this spot until the proposed Hall of Dinosaurs becomes a reality. He will then undergo some further preparation and will be mounted there in his entirety for the enjoyment of the thousands who visit the Museum each year. We hope you have enjoyed our presentation. If you have not already done so, we invite you to come and see Pleezy in person at the Museum, where he has joined countless prehistoric fossils which make up one of the finest displays of its type in the world.

Let me also take this opportunity to invite you to attend our Annual Show which is customarily held the last week end in September. Here the articles from collections of members of our Club are displayed for public view and include fossil and mineral specimens and many articles of Lapidary art.

Watch for announcements of date and place.

Compiled by members of the Lincoln Gem and Mineral Club, Inc. headed by their Field Trip Chairman for 1964, Mr. Gene Eno. The permanent mailing address of the Club is 3601 South Street, Lincoln, Nebraska, % Mrs. Maurice Tracy, Resident Agent.

Plesiosaur Prep

Charles Messenger

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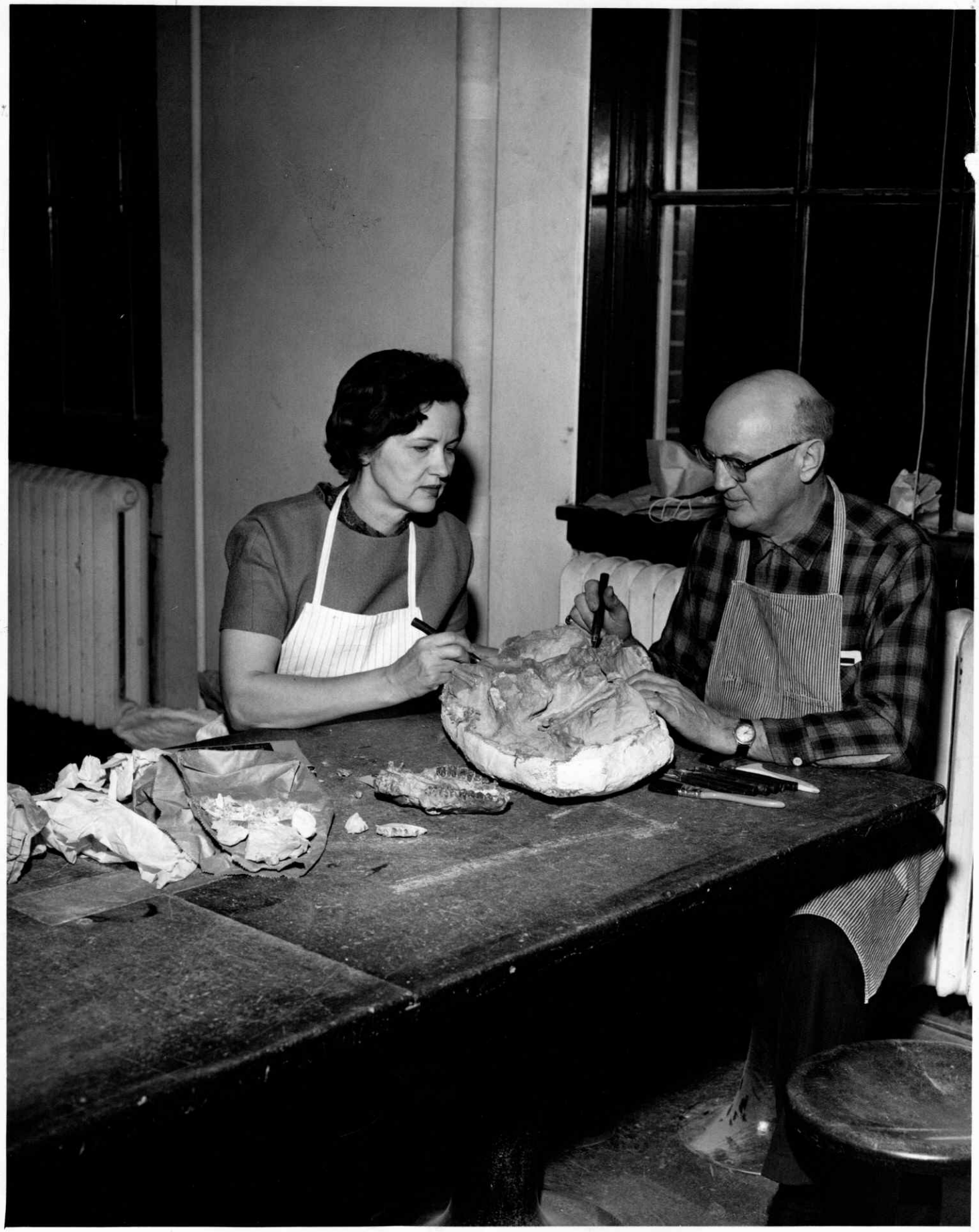

Plesiosaur Prep

Dorothy Englehardt

Pappy Wattle