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WELCOME BACK TO THE FIELD STATION!

SINCE OUR LAST ISSUE THERE HAVE BEEN QUITE A FEW SHAKEUPS FOR THE WORLD OF PALEONTOLOGY! WE HAVE NUMEROUS NEW SPECIES, A DEEP DIVE INTO HADROSAUR MUMMIES, OUR FIRST EVER ANKYLOSAURUS HATCHLING, AND THE INFAMOUS NANOTYRANNUS MAKES A TRIUMPHANT RETURN IN A REMARKABLE NEW STUDY!

IN THE REALM OF MEDIA WE HAD THE PREMIER OF SEASON 3 OF PREHISTORIC PLANET: ICE AGE, THE HOME AND STREAMING RELEASE OF JURASSIC WORLD: REBIRTH, AND THE RELEASE OF THE GAME JURASSIC WORLD EVOLUTION 3 (WHICH HAS ALREADY RECEIVED FREE UPDATES WITH NEW SPECIES, AS WELL AS ITS FIRST DLC PACK FOCUSED ON WETLANDS!)

WE COVER ALL OF THIS LATEST NEWS AND MORE IN YET ANOTHER PACKED ISSUE OF FIELD STATION!



IMAGE BY
DANI NAVARRO

BRONTOTHOLUS HARMONI, A NEW (AND THE FIRST) PACHYCEPHALOSAUR FROM THE TWO MEDICINE FORMATION, HAS BEEN DESCRIBED.

DATED TO ABOUT 75 MILLION YEARS AGO, BRONTOTHOLUS WAS ROUGHLY 3M (10FT) LONG. THE NEW FIND CONTRIBUTES TO A CLEARER PICTURE OF HOW THE LATE CRETACEOUS ECOSYSTEM CHANGED AS THE SEAWAYS RECEDED AND UPLAND ENVIRONMENTS EXPANDED. THIS NEW SPECIMEN ALSO HELPS FORM A BETTER UNDERSTANDING OF PACHYCEPHALOSAUR DIVERSITY AND MORPHOLOGY (SUCH AS HOW DOMES CAN CHANGE OR CERTAIN FEATURES THE SAME BETWEEN SPECIES.)

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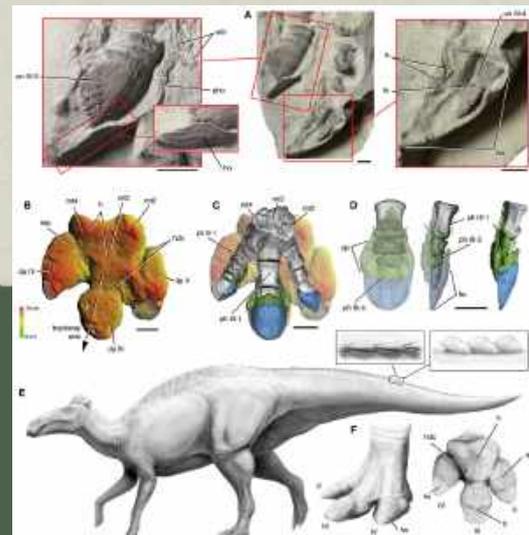
IMAGE BY
CONNOR
ASHBRIDGE



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EDMONTOSAURUS ANNECTENS THANKS TO AN EXTRAORDINARY PRESERVATION PROCESS CALLED "CLAY-TEMPLATING."

IN THIS PROCESS, A THIN CLAY LAYER COVERS THE ANIMAL AND ALLOWS FOR THE CAPTURE OF INCREDIBLE DETAIL USUALLY LOST DURING FOSSILIZATION. IN THIS CASE, RESEARCHERS WERE ABLE TO LOOK AT AND IDENTIFY THE DINOSAUR'S SKIN, SCALES, A FLESHY CREST, SPIKES, AND EVEN HOOVES- ALL IN THREE DIMENSIONS!



HISTOLOGICAL ANALYSIS ON THE BONES OF A **LIAONINGOSAURUS** SPECIMEN, A SMALL ANKYLOSAURID FROM THE EARLY CRETACEOUS OF CHINA, SHOW A HATCHLING LINE- INDICATING THAT THE INDIVIDUAL DIED SHORTLY AFTER HATCHING. THE HATCHLING FOSSIL OFFERS US OUR FIRST GLIMPSE OF WHAT A DEVELOPING ANKYLOSAURUS LOOKED LIKE.

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CONTINUE

PALEO
NEWS

FOR YEARS, PALEONTOLOGISTS HAVE HEAVILY DEBATED IF NANOTYRANNUS IS ITS OWN VALID GENUS OR A JUVENILE TYRANNOSAURUS REX. RECENTLY, CURRENT FINDINGS HAVE DETERMINED THAT NANOTYRANNUS IS INDEED VALID!

IMAGE BY
ANTHONY
HUTCHINGS



PALEONTOLOGISTS LINDSAY E. ZANNO, AND JAMES G. NAPOLI PUBLISHED THEIR FINDINGS IN NATURE IN OCTOBER OF THIS YEAR. AFTER LOOKING AT HUNDREDS OF FOSSILS, INCLUDING THE INFAMOUS "DUELING DINOSAURS," THERE WERE "RED FLAGS" WHEN LOOKING AT THE

BONES IN TERMS OF EXPECTED GROWTH. A CT-SCAN OF THE SKULLS REVEALED THAT THE INCLUSION OF AN EXTRA SINUS CAVITY, THE STRUCTURE OF THE CRANIAL NERVES, AND THE RESPIRATORY SYSTEM ULTIMATELY LOOKED VERY DIFFERENT THAN THOSE OF T.REX. SUCH FEATURES ARE USUALLY SET EARLY IN DEVELOPMENT, MEANING THAT THE SPECIMENS BEING LOOKED AT WERE NOT ON TRACK TO MORPH INTO AN ADULT T.REX. OTHER DETAILS LIKE NANO'S ARMS BEING PROPORTIONALLY LONGER, MEANING THAT THEY WOULD HAVE TO SHRINK OVER TIME, AS WELL AS A GREATER TOOTH COUNT, SHORTER TAIL, AND LONGER LEGS ALSO HELPED LEAD THE SCIENTISTS TO THE CONCLUSION THAT NANOTYRANNUS WAS INDEED ITS OWN ANIMAL.

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JANE, AT THE BURPEE MUSEUM IN ROCKFORD, IL. ONCE THOUGHT TO BE A JUVENILE T.REX NOW HER OWN SPECIES - NANOTYRANNUS LETHAEUS



IN DECEMBER, A SECONDARY STUDY (BY GRIFFIN, ET AL. IN SCIENCE) WAS ALSO PUBLISHED HELPING SOLIDIFY THE EMANCIPATION OF NANO. THE STUDY REVEALED THAT THE CERATOBANCHIAL PART OF THE HYOID (A BONE IN THE THROAT REGION) CAME FROM AN ADULT SPECIMEN, AND NOT A JUVENILE.

THESE FINDINGS ALL POINT TO TWO TYRANTS HAVING DOMINION OVER THE HELL CREEK DURING THE LATE CRETACEOUS. NANOTYRANNUS WAS A PREDATOR BARELY HALF THE SIZE OF T.REX, WITH TYRANNOSAURUS REX WEIGHING ROUGHLY 18,000 POUNDS AND MEASURING MORE THAN 40 FEET, WHEREAS NANOTYRANNUS WAS ABOUT 1,500 POUNDS AND 18 FEET LONG. NANO WAS MOST LIKELY A MORE AGILE AND SPEEDY ANIMAL, COMPARED TO THE HULKING POWERHOUSE THAT WAS AN ADULT TYRANNOSAURUS REX.

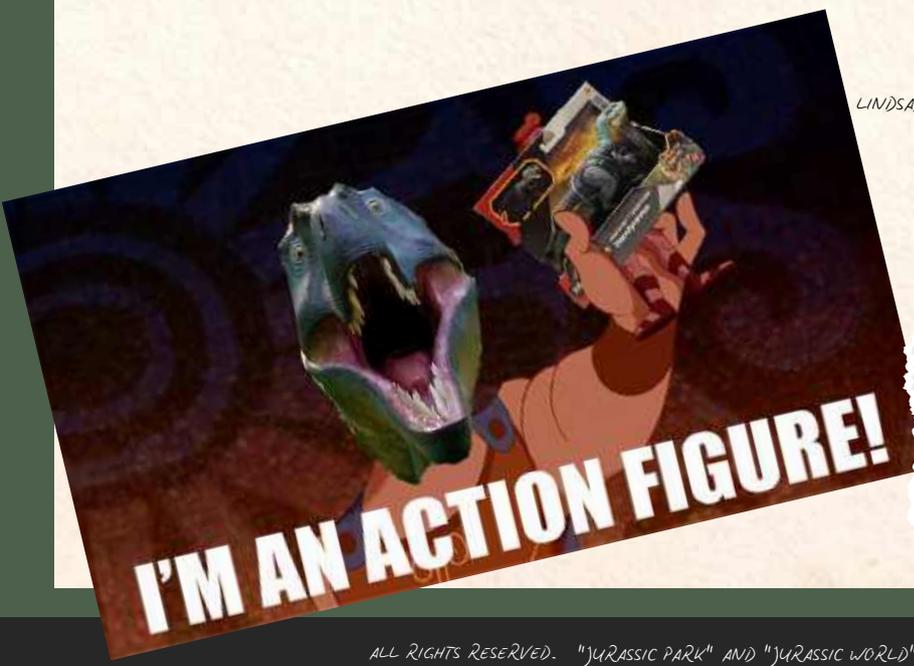
SOME PALEONTOLOGISTS HAVE POINTED OUT THAT IF NANOTYRANNUS IS NO LONGER A JUVENILE T.REX THEN THE QUESTION REMAINS, WHERE ARE ALL OF THE YOUNG TYRANNOSAUR FOSSILS? AND THAT'S SOMETHING THAT ONLY MORE DIGS, FINDS, AND RESEARCH WILL HELP US SOLVE.

LINDSAY E. ZANNO, AND JAMES G. NAPOLI

[Read More](#)

GRIFFIN, ET AL

[Read More](#)



THE TIMING OF THIS REVELATION COULDN'T BE MORE PERFECT, AS THIS FALL MATTEL RELEASED A NANOTYRANNUS FIGURE AS A PART OF THEIR JURASSIC WORLD REBIRTH TOYLINE.

JANE MODEL BY TYLER KEILLOR

HERCULES ©DISNEY

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ARCHAEOPTERYX

<u>FAMILY</u>	ARCHAEOPTERYGIDAE	<u>SPECIES</u>	LITHOGRAPHICA (TYPE SPECIES)
<u>LENGTH</u>	50 CM (1 FT 8 IN)	<u>HEIGHT</u>	19 CM (7.5 IN) AT THE HIPS
<u>WEIGHT</u>	500 TO 1,000 GRAMS (18 TO 35 OZ)	<u>DIET</u>	CARNIVORE
<u>LOCATION</u>	GERMANY	<u>TIME PERIOD</u>	LATE JURASSIC (150 MYA)

NOTES: SINCE BEING DESCRIBED IN 1861, ARCHAEOPTERYX (ARK-EE-OP-TER-ICKS) HAS BEEN ONE OF THE MOST IMPORTANT FOSSIL DISCOVERIES IN PALEONTOLOGY. THIS SMALL CREATURE'S NAME MEANS "ANCIENT WING," WHICH IS APPROPRIATE AS IT IS HISTORICALLY UNDERSTOOD AS THE OLDEST KNOWN BIRD! WHILE ONLY KNOWN FROM A HANDFUL OF SPECIMENS, INCREDIBLE PRESERVATION HAS LEFT IMPRESSIONS OF FEATHERED WINGS ON SEVERAL FOSSILS. BUT ACCOMPANIED WITH TYPICAL BIRD CHARACTERISTICS, LIKE WINGS AND A BACKWARD FACING FIRST TOE, THE FOSSILS OF ARCHAEOPTERYX ALSO HAD ODD DINOSAURIAN FEATURES SUCH AS LONG TAILS AND TOOTHED JAWS, LEADING SCIENTISTS TO ASK WHERE DOES DINOSAUR END AND BIRD BEGIN?

IMAGE KEY

ARCHAEOPTERYX BY ROBERT WALTERS (TOP CENTER)

ARCHAEOPTERYX FROM JURASSIC WORLD ALIVE! MOBILE GAME (TOP RIGHT)

CAST OF THE "BERLIN SPECIMEN" OF ARCHAEOPTERYX AT THE AMERICAN MUSEUM OF NATURAL HISTORY, NY (TOP LEFT)

ARCHAEOPTERYX FROM JURASSIC PARK ARCADE (2015) (TOP LEFT)

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ARCHAEOPTERYX IS AMONG THE FEW MESOZOIC SPECIES FOR WHICH WE HAVE AN INDICATION OF WHAT COLOR IT MAY HAVE BEEN!

IN 2011, R. CARNEY ET AL. USED ELECTRON MICROSCOPY TO STUDY FOSSILISED MELANOSOMES IN THE FEATHERS OF THE ARCHAEOPTERYX' TYPE SPECIMEN ORIGINALLY DISCOVERED IN 1861.

MELANOSOMES ARE RESPONSIBLE FOR THE TRANSPORT AND STORAGE OF MELANIN, THE LIGHT-ABSORBING PIGMENT THAT GIVES A CELL IT'S COLOR. BY COMPARING THE SHAPE AND STRUCTURE OF THE ARCHAEOPTERYX' MELANOSOMES TO MODERN-DAY BIRDS, THEY WERE ABLE TO DETERMINE (WITH 95% ACCURACY!!) THAT THE FEATHER WOULD HAVE APPEARED BLACK IN COLOR.

IN 2020 A FOLLOW UP STUDY DEMONSTRATING THAT THE FEATHER WAS ENTIRELY MATTE BLACK, RATHER THAN SHINY OR IRIDESCENT. WHILE THE FULL PLUMAGE OF ARCHAEOPTERYX IS STILL UNKNOWN, THIS GIVES US A FASCINATING INSIGHT INTO HOW THIS ANIMAL MAY HAVE LOOKED IN LIFE!

IN THE JURASSIC FRANCHISE THE ARCHAEOPTERYX HAS ONLY BEEN SEEN IN APPEARANCES THROUGH SUPPLEMENTAL MATERIAL SUCH AS VIDEO GAMES, COMIC BOOKS, AND OTHER "TIE-IN" MATERIAL WHERE ITS DEPICTION VARIES.

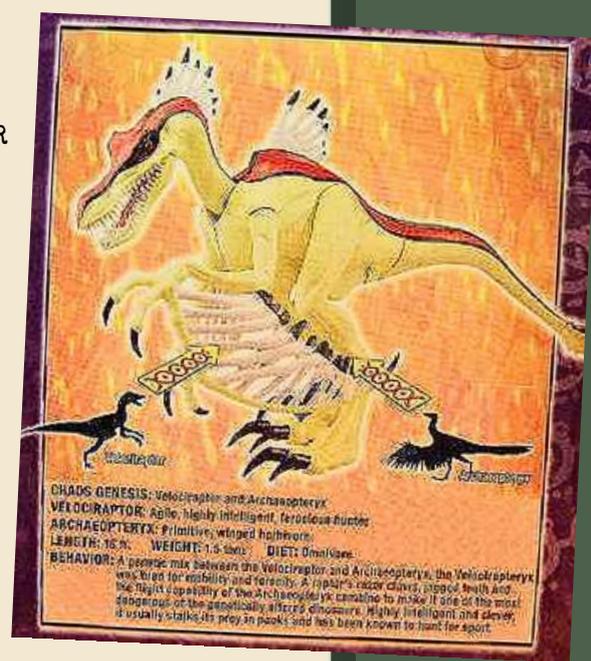


IMAGE KEY

ARCHAEOPTERYX FROM JURASSIC PARK DANGEROUS GAMES COMIC BOOK (2012) (TOP RIGHT)

VELOCIRAPTERYX FROM JP: CHAOS EFFECT TOYLINE, WHICH "USED ARCHAEOPTERYX DNA" TO PRODUCE FIRST FEATHERED JURASSIC PARK DINOSAUR (CENTER RIGHT)

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DOCUMENTARIES



WHY DINOSAURS?

FROM PRESTIGIOUS MUSEUMS AND UNIVERSITIES, TO BLOCKBUSTER FILMS, AMUSEMENT PARK RIDES, VIDEO GAMES, AND TOYS--DINOSAURS HAVE ALWAYS FASCINATED US. BUT, WHY?

THE AWARD-WINNING FILM "WHY DINOSAURS?" FOLLOWS DINO-OBSESSED TEEN JAMES PINTO AND HIS FILMMAKER FATHER ON A JOURNEY AROUND THE GLOBE, INTERVIEWING WORLD-RENOWNED PALEONTOLOGISTS ABOUT THE LATEST DISCOVERIES, DIGGING UP 150-MILLION-YEAR-OLD BONES, AND ENCOUNTERING DINOSAUR FANATICS OF ALL WALKS OF LIFE.

TOGETHER THEY TRACK DOWN THE FILMMAKERS BEHIND JURASSIC PARK AND JURASSIC WORLD, SEE THE WORLD'S LARGEST DINOSAUR TOY COLLECTION, AND ATTEMPT TO DISCOVER WHY EVERYBODY LOVES DINOSAURS!

DIG OPPORTUNITIES



STERNBERG MUSEUM SCIENCE CAMPS PROGRAMS

REGISTRATION FOR SUMMER 2026 WILL OPEN ON JANUARY 9!

DIGITAL RESOURCES

WALKING WITH DINOSAURS VIRTUAL FIELD TRIP



LECTURES & EVENTS

MUSEUM OF THE ROCKIES

VIRTUAL FOSSIL FRIDAYS - EVERY FRIDAY AT 9 AM MST

CONTINUE



RESOURCES

JURASSIC
FOUNDATION



JURASSIC FOUNDATION

FOUNDED IN 1998 BY UNIVERSAL STUDIOS AND AMBLIN ENTERTAINMENT, THE JURASSIC FOUNDATION IS A NON-PROFIT ORGANIZATION DEDICATED TO ADVANCING DINOSAURIAN RESEARCH AROUND THE GLOBE. TO DATE, THE FOUNDATION HAS DONATED NEARLY \$1 MILLION DOLLARS TO SCIENTISTS TO CONDUCT THEIR RESEARCH. RECENT PUBLICATIONS ON RESEARCH AIDED BY THE JURASSIC FOUNDATION CAN BE FOUND ON THEIR [INSTAGRAM](#).

YOU CAN FIND OUT MORE ABOUT THE FOUNDATION, APPLY FOR GRANTS, AND GET IN CONTACT WITH FOUNDATION MEMBERS BY VISITING THEIR WEBSITE: JURASSICFOUNDATION.ORG

MUSEUM MUSTS

DINOSAUR JOURNEY MUSEUM

550 JURASSIC CT, FRUITA, CO 81521
(970) 242-0971

THE DINOSAUR JOURNEY MUSEUM IN FRUITA, CO PROVIDES GUESTS WITH A UNIQUE AND INTIMATE LOOK INTO A LOST PREHISTORIC WORLD. THE MUSEUM, WHICH IS HOME TO 15,000 FOSSIL SPECIMENS ON DISPLAY AND IN THEIR COLLECTIONS, ALSO HOUSES MULTIPLE LIFE SIZED MODELS AND LIFE-LIKE ANIMATRONICS THAT ARE SURE TO CAPTIVATE THE MIND, AS WELL AS A PREP-LABRATORY WHERE GUESTS CAN SEE ACTUAL FOSSIL PREPARATION AND RESEARCH HAPPENING IN REAL TIME.

ALONG WITH THEIR PERMANENT AND TEMPORARY EXHIBITS, THE DINOSAUR JOURNEY MUSEUM ALSO OFFERS DIG OPPORTUNITIES TO THE MYGATT-MOORE QUARRY, A LITERAL HOTBED OF JURASSIC AGED FOSSILS!



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