

THE TELEOSTS, MOST ADVANCED OF MODERN BONY FISHES, WERE ALREADY DOMINANT IN THE CRETACEOUS.

THEY BEGAN THEIR RADIATION IN MID-MESOZOIC TIMES, PROBABLY FROM ANCESTORS LIKE THE LEPTOLEPIDS, AND SINCE THE END OF THE MESOZOIC ERA HAVE DOMINATED BOTH THE SEA AND FRESH WATER. TODAY, WITH OVER 17,000 SPECIES GROUPED INTO 26 ORDERS, THEY COMPRISE 96 PERCENT OF LIVING FISH SPECIES.

THE CRETACEOUS CHALK AND ASSOCIATED STRATA ON THE GREAT PLAINS, ESPECIALLY IN KANSAS, PRESERVE A REMARKABLY DIVERSE SAMPLE OF LATE MESOZOIC MARINE FISH LIFE. ABOUT 30 GENERA OF TELEOSTS AND SEVERAL HOLOSTEANS HAVE BEEN DESCRIBED FROM THESE DEPOSITS, WHICH REPRESENT A FORMER INCURSION OF THE GULF OF MEXICO.

EVOLUTION FROM HOLOSTEAN TO TELEOST GRADE INVOLVED CHANGES IN TECHNICAL CHARACTERISTICS, ESPECIALLY OF TAIL AND SKULL—E.G., ATTAINMENT OF A HOMOCERCAL CAUDAL FIN (CASE TO LEFT, TOP) BRACED BY PAIRED URONEURAL BONES AND SUPPORTED BY TWO OR MORE HYPURALS ATTACHED TO A SINGLE CENTRUM. TELEOSTS ALSO ACQUIRED CYCLOID SCALES WITHOUT AN ENAMEL (GANON) SURFACE, THE SUPRAOCCIPITAL SKULL-ROOFING BONE, A SINGLE MEDIAN PREVOMER IN THE ROOF OF THE MOUTH, INTERMUSCULAR BONES ALONG THE SIDES AND A PRIMARILY HYDROSTATIC FUNCTION FOR THE SWIMBLADDER.

FURTHER EVOLUTION OF TELEOSTS INTO THEIR PRESENT MAZE OF SUBGROUPS HAS BEEN LARGELY A MATTER OF ADAPTING BODY FORM TO DIVERSE AND INCREASINGLY SPECIALIZED MODES OF LIFE.



MYCTOPHIFORMS, AN EARLY DEEP-SEA OFFSHOOT OF SALMONIFORMS. **CHEIROTHRIX** IS RELATED TO THE MODERN LANTERNFISH.



PACHYRHIZODUS WAS ONE OF SEVERAL RELATIVES OF THE TARPON KNOWN FROM THE CRETACEOUS.



SALMONIFORMS (TROUTS AND THEIR RELATIVES), PRESENT IN THE CRETACEOUS, ARE THE GROUP THAT GAVE RISE TO MOST HIGHER TELEOSTS. TWENTY ORDERS DERIVED FROM THEM INCLUDE MINNOWS, CATFISHES, ETC. (OSTARIOPHYSI); LANTERNFISHES, ETC.; SILVERSIDES, ETC.; COOBS, ETC. (PARACANTHOPTERYGII); AND PERCIFORMS AND DERIVATIVES (MOST SPINY-RAYED FISHES).



ELOPIIFORMS INCLUDE BUT 12 PRIMITIVE SPECIES TODAY—TARPONS, BONEFISHES AND RELATIVES. THE GROUP PROBABLY GAVE RISE TO TRUE EELS (ANGUILLIFORMS) AND TO SPINY EELS AND HALOSAURS (NOTACANTHIFORMS). RELATIONSHIP IS IMPLIED ONLY BY THE UNIQUE PRESENCE IN THESE ORDERS OF REMARKABLE, TRANSLUCENT, RIBBONLIKE, LEPTODERPHALOUS LARVAL STAGES.

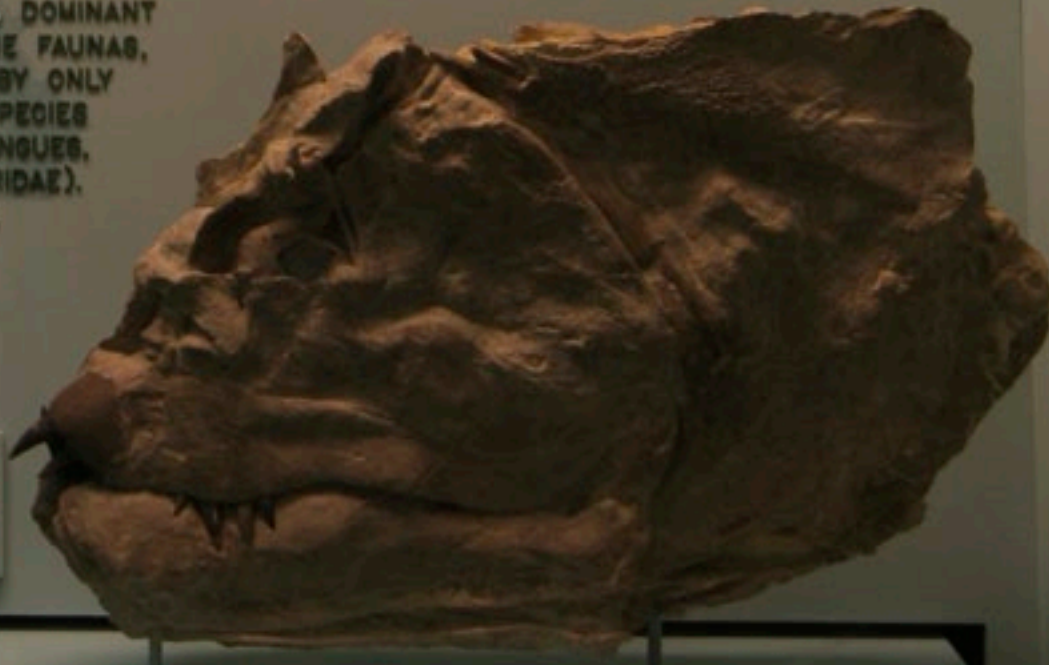
ICHTHYODECTES WAS AN EARLY OSTEGLLOSSIFORM, SOMEWHAT SIMILAR TO THE ANCESTRAL ELOPIIFORMS.



THE **CLUPEIFORMS** ARE SLIMLY COMPRESSED, GENERALIZED TELEOSTS LIKE BARDINES, HERRINGS AND ANCHOVIES.

OSTEOGLOSSIFORMS, DOMINANT IN THE CRETACEOUS MARINE FAUNAS, ARE REPRESENTED TODAY BY ONLY ABOUT 155 FRESHWATER SPECIES SUCH AS MOONEYES, BONYTONGUES, AND ELEPHANT FISH (MORMYRIDAE).

THE OSTEGLLOSSIFORMS, ELOPIIFORMS, AND CLUPEIFORMS APPEARED IN THE JURASSIC; MORE THAN 18 ADDITIONAL ORDERS, INCLUDING THE BERYOIFORMS, APPEARED IN THE CRETACEOUS.



XIPHACTINUS, FAMILIAR TO MANY AS PORTHEUS, WAS A HUGE AND SUCCESSFUL INHABITANT OF CRETACEOUS SEAS.

LEPTOLEPIIFORMS ARE MESOZOIC FISHES TRANSITIONAL BETWEEN THE HOLOSTEANS AND TELEOSTEANS.

LEPTOLEPIS, A JURASSIC FISH TYPICAL OF THE GROUP, RESEMBLED A HERRING IN GENERAL ASPECT BUT RETAINED PRIMITIVE FEATURES, NOTABLY OF THE TAIL AND SCALES.

