Fossil Parade

RHINOCEROSES—A FAMILY TREE

JOHN E. GUILDAY

ONE of the most peculiar trades practiced in the world today, from our standpoint at least, is that of the oriental druggist. His stock in trade includes crocodile skin, snake fangs, tiger claws, blood, whiskers, bone, dung, herbs, fossils; it is the highest development of the "you name it, we got it" style of doing business. In China at the present time extensive fossil mines are being operated for the sole purpose of furnishing fossil bones and teeth for the Chinese pharmacopoeia. When ground into powder and administered, these fossils are reputedly good for man or beast. One of the most valued items in this strange assemblage is rhinoceros horn, which is claimed to heighten the sexual potency of the taker. (That, from the Chinese!)

Rhinoceros horn brought, and is still bringing, a high price on the market, although hunting is legally prohibited. A good horn may be worth its weight in gold when delivered into the right hands.

The rhinoceroses are literally animals with a price upon their heads. But before we look down our noses at this oriental foolishness, let us remember that for hundreds of years the much touted Nordics used cups made of narwhale and rhinoceros (unicorn?) horn to render innocuous any drink that may have been poisoned.

This constant demand for the horn is one of many reasons why the oriental species (two of the genus *Rhinoceros* and one of the genus *Dicerorhinus*) are being wiped from the face of the earth. The two African rhinoceroses, the black rhinoceros (*Diceros*) and the white rhinoceros (*Ceratotherium*) are faring little better, and it will only be a matter of time before the rhino will be an animal of the past.

The living forms are but a dying remnant of a bewildering array of fossil rhinoceroses. Fossil rhino remains have been found during all epochs of the Age of Mammals, with the exception of the first, the Paleocene. They flourished and spread throughout all the continents except Australia and South America, and the only reason they didn't spread into these regions as well was that they were physically incapable of putting out to sea. Australia was cut off from Asia by the sea almost at the dawn of mammalian evolution, barring any major mammalian invasions (the marsupials slipped in just under the wire). South America was similarly isolated until later Tertiary times by connections of the Atlantic and Pacific oceans at Panamá and elsewhere.

The earliest rhinoceros-like animal of which we have any knowledge is found in the American Eocene deposits in our western states. These animals, members of the Hyrachyidae family, were small, ranging from the size of a sheep to that of a pony. They were seemingly adapted for browsing in a forest margin or a savannah-like habitat. *Hyrachyus* was much more lightly built than the modern rhinoceroses, and at that very early evolutionary stage resembled closely, at least in teeth and skeletal parts, the earlier members of related groups such as the tapirs and the horses. These early rhinoceroses as a group had no horns, but a few forms had what seem to be the beginnings of such a structure. The rhinoceros horn, being composed of closely adpressed hair, is of course not fossilized. It disappears with the skin and other soft parts before fossilization takes place. But its position in animals that had it may be inferred from the presence of rough raised areas upon the nasal or the frontal bones of the skull which serve as a support for the horn.

The hyrachyids—small, primitive horn-

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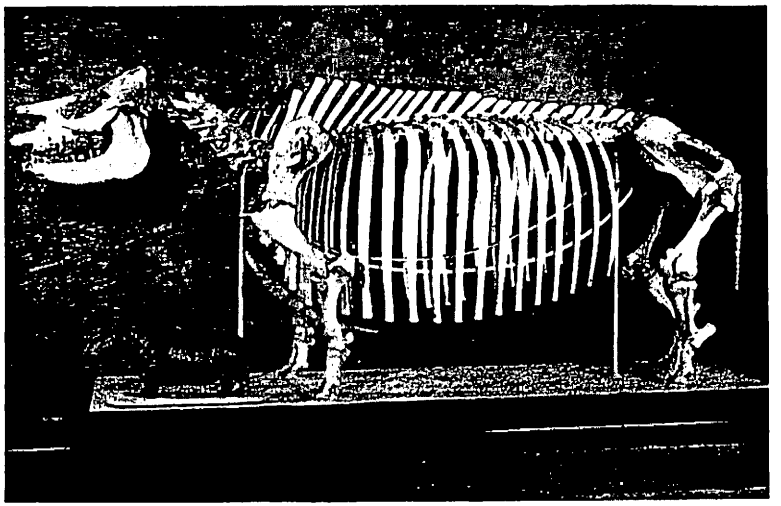

TELEOCERAS (Carnegie Museum Collection)
One of the last rhinos to disappear from the American scene

less animals near the base of the entire rhinoceros family tree—persisted during Eocene times but disappeared at the end of that epoch to be replaced by more progressive forms. Their fossil remains have, with one possible exception, been found only in North America.

Two other primitive stocks of rhinoceroses, presumably derived from early hyrachyid ancestors, appeared during middle and late Eocene times, the hyracodonts and the amynodonts.

The hyracodonts' evolutionary pattern of change was very similar to that of the horse. They were comparatively slim, long-limbed animals that depended upon speed to escape from their enemies. Although their teeth were becoming more and more like those of a modern rhinoceros, the feet were approaching the condition found in the contemporary three-toed horses. They were depending mainly upon the third digit for support, and the lateral toes were becoming smaller and carrying less and less of the body weight. So it is conceivable that had this group continued to evolve in the same direction and not become extinct in early Tertiary times, Dad might be betting his roll on a rhinoceros in the third. The hyracodonts succumbed, however, possibly because of inability to compete with other evolving groups of herbivorous mammals, and became extinct in Oligocene times.

The amynodonts evolved along a quite different line. They were heavier, their legs were short and stocky, and they relied for protection not upon speed but apparently upon size. They had about the bulk and proportions of a modern hippopotamus and may possibly have led a semiaquatic life, much as the "hippo" does today. These ponderous animals were hornless, but their canine teeth evolved into huge hippopotamus-like tusks. They became extinct in middle Oligocene times in both Europe and North America, but lingered on into the late Miocene in Asia.

The true rhinoceros stock appeared in both Eurasia and North America in the latter part of the Eocene, and an enormous variety of rhinos have appeared from then until the present. Their evolution might almost be called explosive, and the task of studying its complicated ramifications is still far from complete.

The largest land mammal known, *Baluchitherium*, was an Asiatic rhinoceros that lived during the Oligocene. The skull of this monster was four feet long, yet was small in proportion to his body, which towered nineteen feet at the shoulder. The

animal was long-limbed and long-necked, and its feeding habits probably paralleled those of the giraffe.

Three extinct American rhinoceroses may be seen in the Hall of Prehistoric Mammals here at Carnegie Museum: *Trigonias*, a primitive hornless Oligocene rhinoceros; *Diceratherium*, a Miocene form; and *Teleoceras*, a strange Pliocene rhinoceros, one of the last of the American rhinos.

The skeleton of *Diceratherium* in the Hall was found at the famous Agate Springs fossil quarry in Nebraska, undoubtedly the richest deposit of Miocene mammalian fossils in the world. This animal was a little larger than the modern tapir and sported two horns, not one behind the other in orthodox rhinoceros fashion, but side by side on the tip of the snout. The diceratheres lived from the late Oligocene to the late Miocene and increased in size during that time. This group seems to have died out completely, leaving no known descendants.

Teleoceras, a horned rhinoceros, at first glance looks like a cross between a rhinoceros and a dachshund. The legs were extremely short. This aberrant rhino paralleled in general body proportions the more primitive amynodonts but was nevertheless a true rhinoceros. Despite the animal's ludicrous appearance, its brain is the most advanced rhinoceros brain known. (The brain of a fossil animal may be studied by means of casts of the interior of the skull where the brain had been.)

None of the American rhinos appear to have survived the Pleistocene. That glacial epoch spelled the doom of many mammals that had become too specialized and were not able to adapt themselves to drastic environmental changes.

In Europe, Asia, and Africa, however, the rhinoceros persisted. The great woolly rhinoceros *Coelodonta*, an animal about six feet high at the shoulder and covered with a thick insulating coat of hair, roamed the tundras of Siberia with the mammoth. Pictures of these beasts painted and engraved on cave walls have been passed down to us by the early Cro-Magnon cave men of Europe. With their colorful past and uncertain future the rhinos of today are truly living fossils—faunal relics that the world can ill afford to lose.

SPRING CLASSES

REGISTRATION for the twelve-week spring term of art and craft classes beginning February 6 at Carnegie Institute will be taken January 25, 26, and 27 at the Institute.

Classes will be held in beginning, intermediate, and advanced drawing and painting, and principles of color and design; in flash, color, and portrait photography; linoleum-block and silk-screen printing; and other crafts, including weaving, beginner's metalwork, beginner's taxidermy, and fly-tying. As weather permits, the art classes will concentrate more and more on out-of-door painting. The Explorer's Club on Tuesday evenings also will move outdoors later on.

The instructors are all highly competent and at least locally well known.

Fees for tuition are extremely moderate, and members of Carnegie Institute Society receive the advantage of lower rates.

MUTINY ON THE CAINE

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are all amateurs and we are all weak. Yet something in us keeps us from giving up, and we fight our weaknesses. We may work by means of complexes or pretenses or excuses, but we do the work. We rise up against the inner desire to give up. It is an insurrection against the powers of nature and human hostility that would crush us. We fight against the storms of the sea. This uprising of man against his own weaknesses to do the work that has to be done is the ethical essence of *The Caine Mutiny*.

TESTING RHYTHMIC ABILITY

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the tests used to select flight trainees in the Air Force. Do individuals who perform well on one kind of task also perform well on the other kinds of tasks? In general, some such relationship seemed true.

The next time you hear the constant drip-drop of water from a faucet, test your rhythmic ability. Try to tap a pencil point in perfect synchrony with the drop. It's not easy. And remember, when you think you are in perfect synchrony, a psychologist's electronic equipment would tell you otherwise.