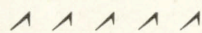


The
SINCLAIR
DINOSAUR BOOK



PICTURED ON THE COVER are some of the better known American Jurassic dinosaurs. The huge *Brontosaurus* is described on page three and the plated *Stegosaurus* on page five. *Allosaurus* attacking *Stegosaurus* was the largest flesh-eater of Jurassic times and in most characters similar to the later giant flesh-eater *Tyrannosaurus* described on page seven. The slender creature running away is *Ornitholestes*, meaning "bird robber," a name given in relation to its supposed bird-catching ability. *Ornitholestes* was a light-limbed, hollow-boned, agile dinosaur of flesh-eating habits.



A WORD OF APPRECIATION

TO MR. BARNUM BROWN, CURATOR OF FOSSIL REPTILES
AMERICAN MUSEUM OF NATURAL HISTORY
NEW YORK CITY, MARCH, 1934

We are deeply indebted to Mr. Brown for his careful revision of the manuscript for this book and for his exhaustive care in helping Sinclair give the American public a scientifically accurate account of an extremely fascinating subject.

The paintings for the Sinclair Dinosaur Book were made by James E. Allen under the supervision of Mr. Brown.



DINOSAUR means "ter-

rible lizard". The dinosaurs became extinct about 60,000,000 years ago and the earliest known members of the race lived approximately 200,000,000 years ago during that part of the earth's history known as the Mesozoic age. There were many different kinds of dinosaurs. Some species were no larger than a domestic chicken; others reached a length of nearly 100 feet and weighed several tons.

Some dinosaurs were carnivorous (flesh-eating). Others were herbivorous (plant-eating).

Dinosaur remains have been found on every continent, practically in all parts of the world, but their remains are most numerous and best preserved in the Western United States and Alberta, Canada.

The six different kinds of dinosaurs pictured on the following pages were sketched from carefully prepared models and paintings based on authenticated specimens on view at the American Museum of Natural History, New York City. Sinclair displayed animated models of these same dinosaurs at the Chicago World's Fair in 1933 and 1934. The first year that the dinosaurs were exhibited in Chicago nearly 9,000,000 people came to see them.

Sinclair uses dinosaurs to symbolize the vast age of the crude oils which are refined into Sinclair Opaline Motor Oil and Sinclair Pennsylvania Motor Oil (by and large, the oldest crudes make the finest lubricants). It was during the lifetime of such prehistoric creatures that nature was mellowing and filtering *under the earth* the crude oils which are refined into Sinclair Motor Oils.



BRONTOSAURUS

Brontosaurus means "thunder lizard"—so named because the discoverer fancied this huge beast was large enough to shake the ground. *Brontosaurus* and many equally large dinosaurs lived during the Jurassic period of the Mesozoic age when his kind were most numerous and attained their maximum size. He was one of the largest and best known of the dinosaurs, reaching a length of 70 feet and weighing several tons.

The brontosaurus evidently spent most of their time in the lakes and marshes, then present east of the Rocky Mountains, floating about like huge salamanders. Being cold-blooded, slow moving creatures they did not require large quantities of food, hence nature provided them with small heads and weakly constructed teeth. Unlike fast moving creatures their bones were united by thick cartilage pads. Having no means of defense they sought deep water when attacked by the powerful, swift moving, flesh-eating dinosaurs that preyed upon them. Their long necks enabled them to spot their enemies afar. Evidently dinosaurs of this type congregated in great numbers in favorable places for many skeletons have been found massed together in quarries at Medicine Bow, Wyoming, and at the Dinosaur National Park near Vernal, Utah.



STEGOSAURUS

Stegosaurus means "roofed lizard". *Stegosaurus* was a plant-eater that lived during the Jurassic period and was contemporaneous with *Brontosaurus*. He is one of the most curious of all of these strange creatures—chiefly because of the double row of broad dermal plates rising above the back and terminating in four long spikes near the end of the tail—his only means of defense. When unduly annoyed, he probably swung about and lashed out with his tail to the damage of anything that remained within reach.

Although 25 feet in length this strange creature had a very small head with tiny teeth and a brain that weighed only two and one-half ounces, whereas the spinal cord in the sacrum was enlarged twenty times the size of the brain, probably for the innervation of the dermal plates and the long hind legs. His peculiar development of nerve centers is the basis of the following poem:

THE DINOSAUR

*"Behold the mighty dinosaur
Famous in prehistoric lore,
Not only for his weight and strength
But for his intellectual length.
You will observe of these remains
The creature had two sets of brains—
One in his head (the usual place),
The other at his spinal base.
Thus he could reason 'A priori'
As well as 'A posteriori'.
No problem bothered him a bit:
He made both head and tail of it.
"So wise he was, so wise and solemn
Each thought filled just a spinal column.
If one brain found the pressure strong
It passed a few ideas along;
If something slipped his forward mind
And if in error he was caught
He had a saving afterthought,
As he thought twice before he spoke
He had no judgments to revoke;
For he could think without congestion,
Upon both sides of every question."*



TRICERATOPS

Triceratops means "three horns on the face". This dinosaur lived during the Cretaceous period at the close of the Mesozoic age several million years after *Brontosaurus* and his kind had disappeared. In all ceratopsia, or horned dinosaurs, the heads are unusually large and the brain is relatively small; in a skull six feet long the brain weighed only eight ounces. But the head is made up largely of frill that extended back over the short neck, protecting it and was not heavy in proportion to its massiveness as the bone was spongy in texture. The horns

vary in length and development according to the species and may have served as a defensive weapon, although probably not sheathed in true horn.

Triceratops was a vegetable feeder with small teeth and a powerful beak like a turtle or parrot, evidently used in clipping tough vegetation. His hind legs were fairly long while the front legs were comparatively short with elbows widely bowed so that he could feed on low growing plants. A few specimens of ceratopsians closely related to *Triceratops* have been found with impressions of the skin preserved showing low tubercles arranged in definite pattern.

TYRANNOSAURUS

Tyrannosaurus rex means "king of the tyrant lizards". And king of his time he was indeed, for he was the largest flesh-eater that has ever lived. *Tyrannosaurus* lived at the close of the Cretaceous period which marks the disappearance of all dinosaur life.

Tyrannosaurus was 47 feet in length and when erect was fully 20 feet in height. His enormous head was armed with saw-bladed, dagger-like teeth six inches long. In fighting this fearsome brute could open his mouth four feet. His neck was massive, with forearms

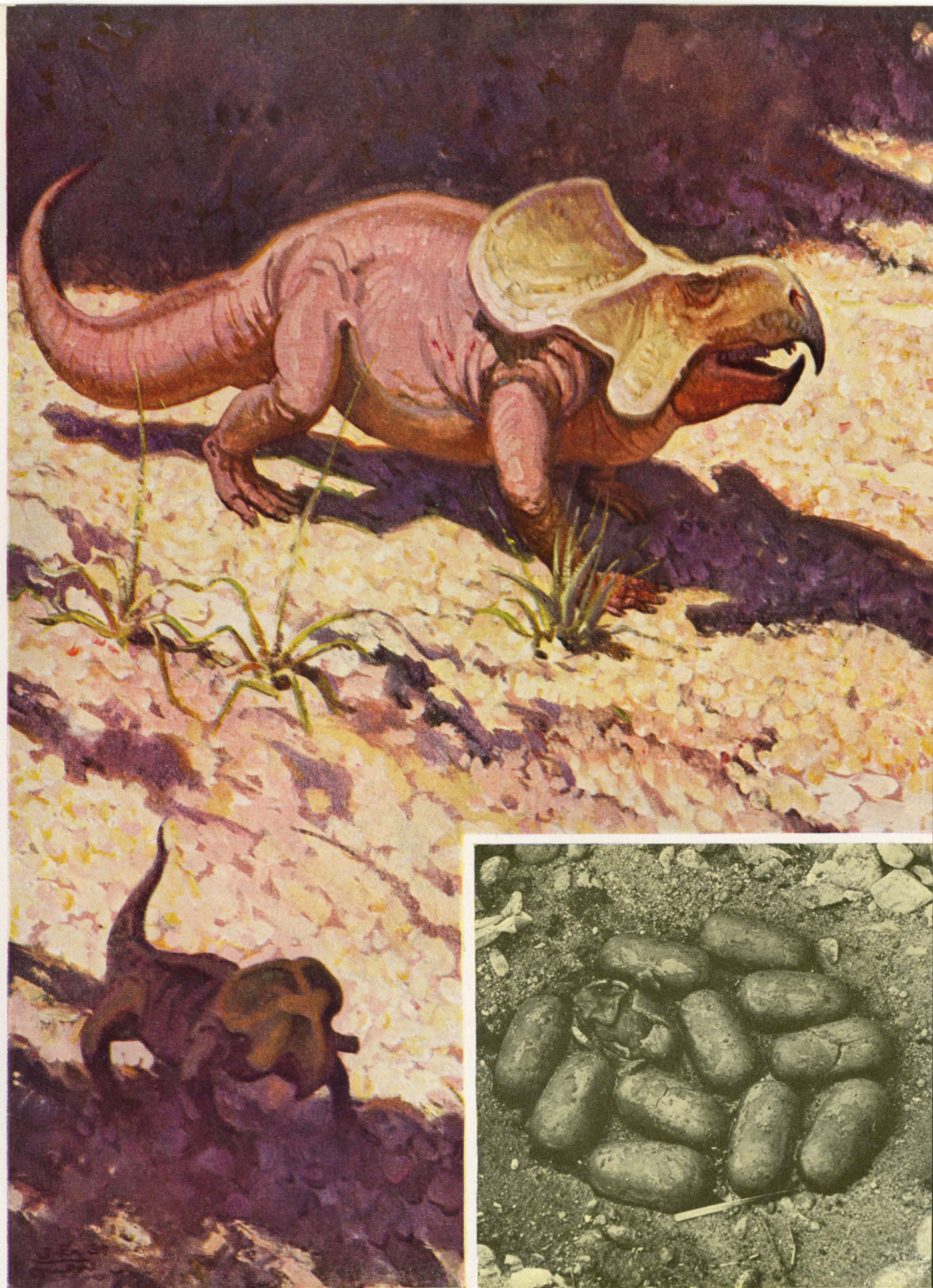
no larger than those of a man, and his large hind legs terminated in three powerful toes with claws like those of an eagle. Evidently he used these large hind feet to hold his prey, while the powerful neck and massive jaws enabled him to rend the flesh of his hapless victims. Like all carnivorous dinosaurs the bones of *Tyrannosaurus* were hollow while his joints were close fitting, indicating an active creature. Evidently he could leap upon and bring down such sluggish victims as *Triceratops* and other slow-moving dinosaurs although, no doubt, at times he fed upon the carcasses of dead creatures.

PROTOCERATOPS

Protoceratops means "forerunner of the horned face". This small herbivorous dinosaur was only about six feet long and lived during the Cretaceous period. He, or rather she, has achieved fame mainly by proving what scientists had long maintained—that some dinosaurs at least were hatched from eggs like turtles.

Most of the dinosaur eggs known at present are probably those of the *Protoceratops*. They were discovered in the deserts of Mongolia several years ago by an expedition from the American Museum of Natural History. The eggs which in size and shape look very much like medium sized Idaho potatoes may be seen at the American Museum of Natural History in New York City, and in the Field Museum of Natural History, Chicago, Illinois.

The picture on the opposite page which shows the dinosaur eggs is a photograph of a nest which was modelled for the Sinclair Dinosaur Exhibit at the Chicago World's Fair in 1933. The eggs in this nest are replicas of real dinosaur eggs on display at natural history museums. The nest proved to be one of the most popular displays at the Sinclair Exhibit, attracting the crowds and holding their attention quite as much as did the biggest and most outlandish of the dinosaurs. Note that one of the eggs has been opened showing the baby dinosaur as it lay in its shell before being hatched.



CORYTHOSAURUS

Corythosaurus means "helmeted lizard", so-named because the top of the skull resembles a Corinthian helmet. *Corythosaurus* was one of several closely related dinosaurs forming the great family Trachodontidae—the "duck-billed" dinosaurs that lived toward the close of the Cretaceous period. All had the same general type of body differing chiefly in the skulls and evidently they were similar in habits.

Trachodonts are the best known of all dinosaurs for their remains are most commonly found and they were probably as numerous during the Cretaceous period as deer are today. They lived in the lakes and marshes taking refuge in deep water when pursued by the giant killers. They ranged up to 35 feet in length and when erect on the hind legs stood 17 feet high. Evidently they fed on plants and were remarkable for their great number of teeth; no less than twenty-five hundred teeth are found in the skull and jaws of some species, arranged like the shells in the magazine of a gun. When a tooth wore out another from below replaced it.

Many specimens of "duck-billed" dinosaurs have been found with impressions of the skin preserved. At one place on the Red Deer River in Alberta, Canada, it was estimated that parts of five hundred individuals of one kind were preserved in a single quarry.



OTHER DINOSAURS

The dinosaurs which are pictured in the Sinclair Dinosaur Book are only a few of the better known kinds that lived during the Mesozoic age. No less than 5,000 distinct species have been described and each year new types are being added to the list. They were cold-blooded, air-breathing reptiles ranging in size from little creatures no larger than a rabbit to the huge *Brachiosaurus*, 80 feet in length. Some dinosaurs were herb-eaters, others were flesh-eaters. Some walked on all four legs, others upright on their hind legs; some were smooth skinned, others were covered with plates; some had tiny heads, others had enormous heads armed with spikes; some were provided with hundreds of teeth, others were toothless, but all shared certain anatomical characters in common for which reason they are grouped together in one great order.

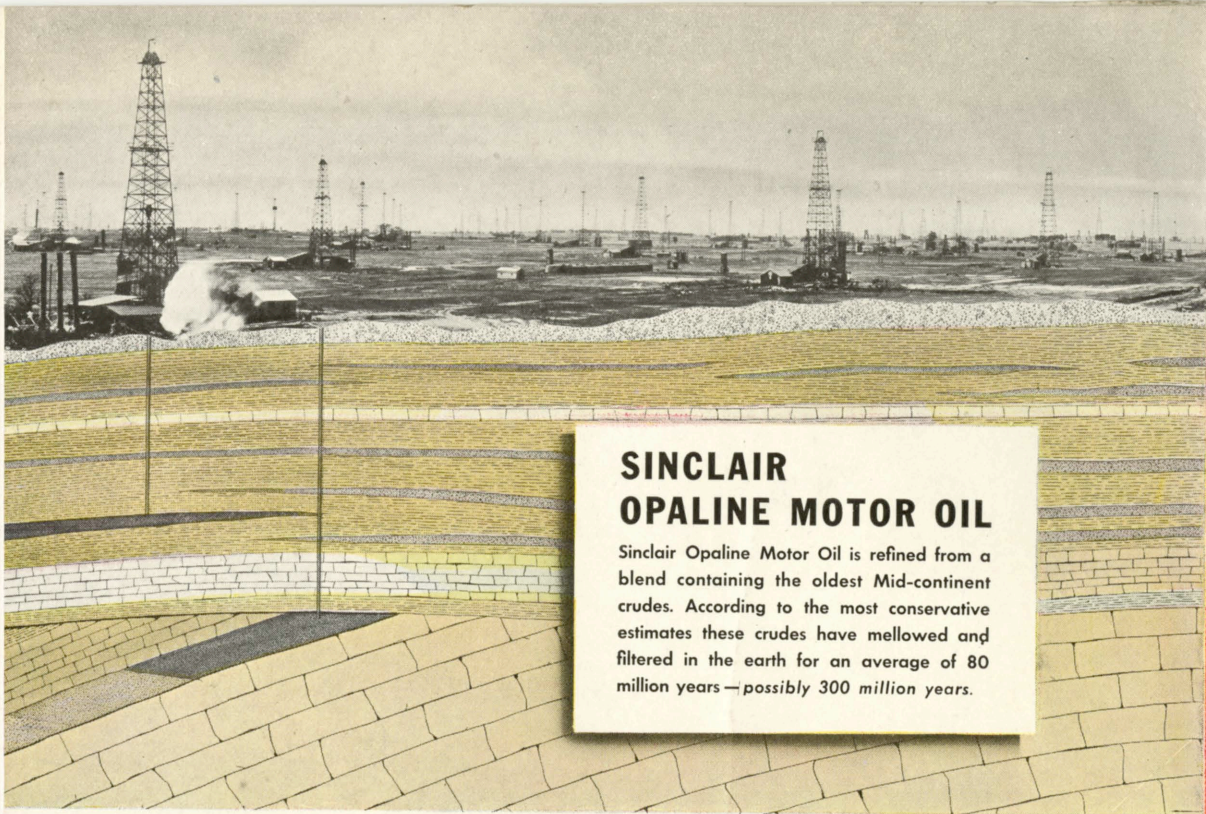
There are no near blood relatives of the dinosaurs living today, although they have some characters common to the alligators, lizards, and birds. Their line started sometime during the Triassic and the entire order became extinct at the close of the Cretaceous period when through changes in land masses the climate became drier and colder and the lakes and marshes in which they lived were drained off. With the disappearance of the particular type of vegetation to which they were adapted the herb-eaters died out locally and, of course, the flesh-eaters went with them—their places being taken by the more adaptable mammals which grew and multiplied until they in turn inherited the earth.

Dinosaur remains are on display at these institutions: American Museum of Natural History, New York City . . . Carnegie Museum, Pittsburgh, Pa. . . Denver City Museum, Denver, Colo. . . Dinosaur Monument, U. S. National Park, Jensen, Utah . . . Field Museum of Natural History, Chicago, Ill. . . Museum of the University of Alberta, Edmonton, Alberta, Canada . . . Museum of Comparative Zoology of Harvard University, Cambridge, Mass. . . Museum of the University of Manitoba, Winnipeg, Canada . . . Museum of Princeton University, Princeton, N. J. . . National Museum of Canada, Ottawa, Canada . . . N. J. State Museum, Trenton, N. J. . . Peabody Museum of Yale University, New Haven, Conn. . . Royal Ontario Museum of Paleontology, Toronto, Ontario, Canada . . . Rutgers University, New Brunswick, N. J. . . U. S. National Museum, Washington, D. C. . . University of Colorado, Boulder, Colo. . . University of Utah, Salt Lake City, Utah . . . University of Wyoming, Laramie, Wyo.

Further information relating to dinosaurs may be had by writing the Curator of Fossil Reptiles at the American Museum of Natural History, New York City.

GEOLOGIC TIME CHART

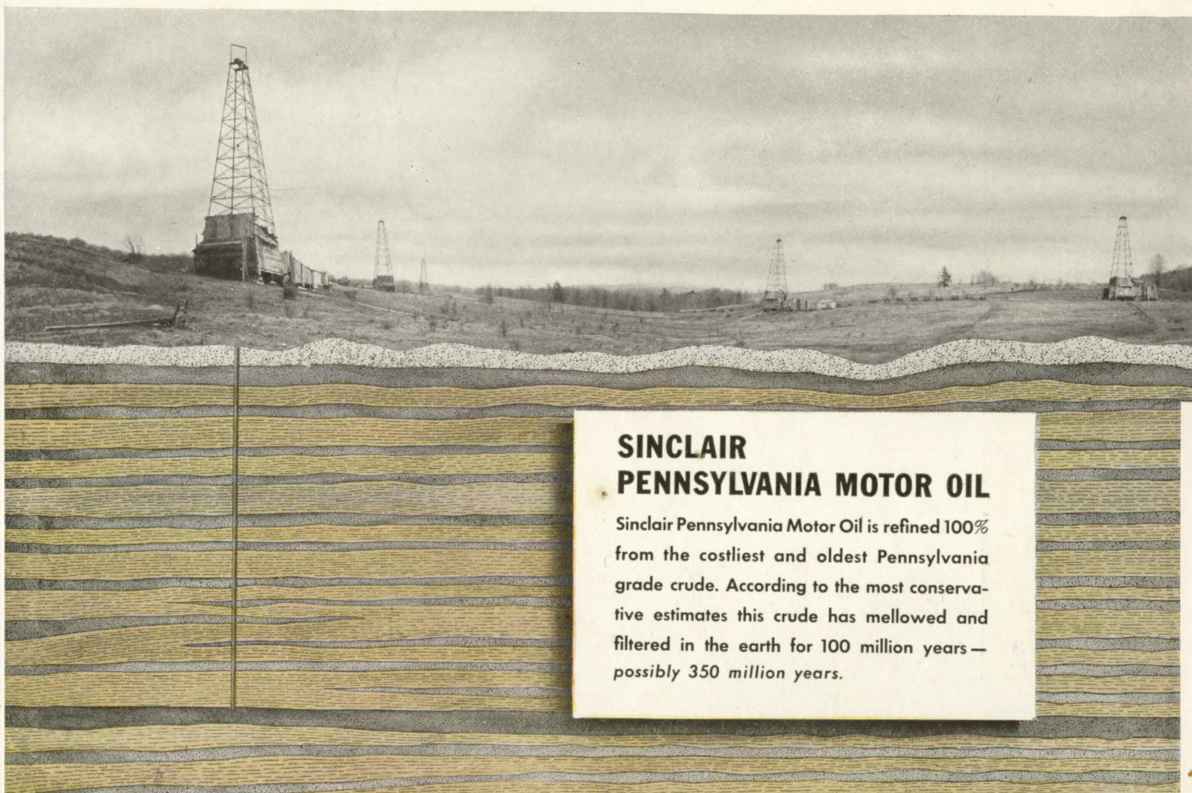
ERAS	PERIODS	DURATION IN YEARS	DOMINANT LIFE	CHARACTERISTIC LIFE	
CENOZOIC	RECENT	10,000	Man		
	PLEISTOCENE	1,000,000			
	PLIOCENE	6,000,000			
	MESOZOIC	MIOCENE	12,000,000	Mammals	
		OLIGOCENE	16,000,000		
		EOCENE	20,000,000		
PALEOCENE		5,000,000	Reptiles		
CRETACEOUS		65,000,000			
JURASSIC		35,000,000			
TRIASSIC	35,000,000	Amphibians			
PERMIAN	25,000,000				
PALEOZOIC	CARBONIFEROUS	85,000,000	Fishes		
	DEVONIAN	50,000,000			
	SILURIAN	40,000,000	Invertebrates		
	ORDOVICIAN	85,000,000			
	CAMBRIAN	70,000,000			
PROTEROZOIC	UPPER PRECAMBRIAN	650,000,000	Primitive Multicellular Forms		
	LOWER PRECAMBRIAN	650,000,000	Unicellular Forms	 Magnified 300 Times	



SINCLAIR OPALINE MOTOR OIL

Sinclair Opaline Motor Oil is refined from a blend containing the oldest Mid-continent crudes. According to the most conservative estimates these crudes have mellowed and filtered in the earth for an average of 80 million years—possibly 300 million years.

(Above) A Mid-continent oil field with a cross-section of underlying strata showing two wells producing from different geological ages. (Below) A Pennsylvania field showing a well producing from the Devonian Age strata. According to the most commonly accepted theory, crude petroleum originated from decaying animal or vegetable matter which has been confined under the earth for many millions of years and subjected to terrific heats and pressures.



SINCLAIR PENNSYLVANIA MOTOR OIL

Sinclair Pennsylvania Motor Oil is refined 100% from the costliest and oldest Pennsylvania grade crude. According to the most conservative estimates this crude has mellowed and filtered in the earth for 100 million years—possibly 350 million years.