

RETURN TO SODOM
AND GOMORRAH
by CHARLES PELLEYRIN
CH. 3: THE MAKING OF
THE LAND

There is a grandeur in this view of life, with its several powers, having been breathed by the Creator into a few forms or into one; and that, whilst this planet has gone cycling according to the fixed laws of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been and are being evolved.

—CHARLES DARWIN, *The Origin of Species*

We are convinced that masses of evidence render the application of the concept of evolution to man and the other primates beyond serious dispute.

—PONTIFICAL ACADEMY OF SCIENCE,
Vatican City, 1983

WHEN THE EARTH was already ancient, of an age most of us seldom encounter in our thoughts, events that ultimately prove to be of galactic and even universal importance were taking place in Africa.

During the warmest part of the Miocene Epoch (about 20 million B.C.), as lush forests penetrated into northern Alaska and even the Antarctic coastline sprouted evergreens, the cosmopolitan dryopithecine apes spread across the savannas of Ethiopia and Kenya to the shores of the Egyptian sea. The changing climate, probably the result of increased solar radiation (from a Sun that had been behaving strangely for some fifty million years), had transformed equatorial forests into semiarid plains, across which a form of life the world had never seen before was advancing like a wave.

Four million years earlier an obscure bamboo descendant had begun scattering its seeds to the wind, and the first grasses now carpeted the treeless ground. In time the descendants of grass—including wheat, corn, barley, and common lawn grass—would, in their own way, enslave the descendants of dryopithecines. They were going to spread everywhere the toolmakers went, until they became as a living membrane over the surface of the planet, manicured, watered, bred, and fertilized.

The dryopithecines walked on all fours. Looking somewhat like large monkeys without tails, they stood somewhere between monkeys and apes, and probably closer to apes. Casts of the insides of their skulls reveal small but nevertheless recognizable frontal lobes. They were the newest and brightest things around, but they were a long way from dominion of the Earth. Even the lowly snake held sway over them, though it, too, was a relative newcomer, in terms of geologic time, having crept out of the Earth only yesterday.

The cobra's ancestors had lived underground during the reign of the last dinosaurs. They were, in those days, barely larger than the ratlike mammals

WHO ARE TOOLMAKERS?

WHAT DOES THIS MEAN?

who huddled with them beneath the Earth, but they were far better adapted to a burrowing lifestyle. Any genetic changes that had damaged or even reduced the legs to relics of shoulder blades and hipbones did not harm the first snakes. Quite the opposite: The stunting and eventual loss of limbs improved their streamlining. There were further adaptations to a subsurface environment. Efficient burrowers can easily damage the delicate eardrum, and hearing is not of much use underground (vibrations are better detected through body surfaces in direct contact with the ground, as is the case with snakes, which *feel* sounds), so mutations that eroded the eardrum were more blessing than curse, and the snakes encountered by *Dryopithecus* were, like all snakes, deaf.

The ancestral snakes of the Late Cretaceous Period (about sixty-five to one hundred million years ago) probably preyed upon insects, worms, and burrowing shrewlike mammals. Early in the Cenozoic Era (the Age of Mammals), muddy lake bottoms began preserving the skeletons of snakes more than ten feet long. In megayears past, the saurians had crowded their brethren out of the sunlight. And now that lost reptilian tribe was coming back—changed. When it ventured aboveground, the dinosaurs were either vanished or fading, and the “rats” had begun radiating and diversifying into vacant niches, evolving toward the varied mammalian forms we know today. This newer, more varied menu of prey species (combined with an absence of predatory dinosaurs) may be precisely what tempted the snakes aboveground, in turn triggering their own radiation and diversification. By 20 million B.C. pythons and cobras had grown to such lengths that they could easily kill a *dryopithecine* and swallow it whole.

Twenty million years later, human infants exhibit an untaught fear of snakes and iguanas, but not of kittens, rabbits, or chicks. Evidently our DNA carries a deep-rooted, instinctive message: Reptiles are our enemies. The *dryopithecines*, too (who appear to have been located near the trunk of our family tree), must have been born with an innate fear of snakes. It persists among infant chimpanzees, gorillas, and baboons as well as humans. This shared genetic memory probably goes back past the *dryopithecines* to a time when our ancestors—furry and ratlike—were perpetually underfoot, living in the nooks and crannies of a world whose chief denizens usually possessed scales and were often terrifyingly large.

“The pervasiveness of dragon myths in the folk legends of many cultures is probably no coincidence,” says Cornell University astrobiologist Carl Sagan. “The implacable mutual hostility between man and dragon, as exemplified in the myth of St. George, is strongest in the west. (In chapter 3 of Genesis, God ordains an eternal enmity between reptiles and humans).

WHO TEMPTS ADAM

But it is not a western anomaly. It is a worldwide phenomenon. Is it only an accident that the common human sounds commanding silence or attracting attention seem strangely imitative of the hissing of reptiles?” SSSHHHHHH

The dragons of our myths and our nightmares apparently reside in the deeper, more archaic parts of the brain programmed by our genes, those same parts that tell us how to walk and eat and to be afraid of the dark without ever being taught. A genetic memory should not persist for tens of millions of years unless it imparts some sort of survival value. Like the snake's eardrum, it should have become vestigial soon after it ceased to serve us.

DO WE STILL NEED THIS FEAR?

By the time *Dryopithecus* appeared, the last of the pack-hunting monsters known to paleontologists as “terrible claw” had been dead for ages. There were no more velociraptors or tyrannosaurs in Eden, but cobras had taken their place.

Had the snakes remained hidden in the Earth, had they never spread across the continents and evolved into newer, deadlier forms, it is possible that lingering memories of an ancient hostility between reptiles and mammals would have, in a fate similar to that of the human appendix (which was rendered obsolete by the control of fire and the invention of cooking), degenerated by *dryopithecine* times, and children would not now be both fascinated and horrified by fantasies of slitherings underneath their beds. But on an African savanna in 20 million B.C., with cobras lurking in the grass, and crocodiles camouflaged to resemble logs at the edges of water holes, an easy way for a *dryopithecine* to die was to forget the fear of reptiles. So dark shapes rasped and hissed in the savage brain, and in the first books of the Bible, the serpent emerged as a symbol of power and evil; and in some small way, the dinosaurs were alive-seeming still.

The most ironic feature of the coevolution of serpents and humans is that we mammals are at least partly responsible for the persistence of unpleasant memories. It was the very diversification and success of our ancestors that created a need to preserve images of hostile reptiles. By encouraging the emergence and diversification of snakes, the *dryopithecines* and their contemporaries had, in essence, become the creators of their own tormentors.

? EXPLAIN THIS.

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By 18 million B.C. huge gyres of solid rock, circulating so far below the African continent that the sheer weight of overlaying material caused them to flow like a warm, superdense plastic, had raised Egypt out of the Mediterranean Sea. Grasses, snakes, and *dryopithecines* covered the new land almost as quickly as it was pushed up.

NO WUNDER MOSTS  
TO STIMULIZE  
THE SENSES  
EMIL

The Red Sea did not exist as yet. The Arabian microcontinent was still welded solidly to Africa. It extended north from Egypt, through Israel to Syria, and east across Iraq, Turkey and Iran, were foreign shores, on the other side of a narrow sea. For tens of millions of years the African-Arabian continent had stood apart from the rest of the world, and the Mediterranean was an open ocean much like the Atlantic. Floating atop a sluggish but constantly convective stew, the landmass was (and still is) drifting northward at about the rate human fingernails grow. Two or three inches per year may not sound particularly dramatic, but over the course of thousands of years it adds up to more than two hundred feet. In a million years the continent moves forty miles; in twenty million years it can drift halfway across an ocean.

*Dryopithecus* was living on a giant raft of land, bound on a collision course with Eurasia. The first jolts were felt in east Africa. The Earth buckled there, rose like a dome, then cracked open and produced rift valleys studded with volcanoes. Pressures from below pushed layers of rock above the basement until they stood forth as a new mountain range. The rise per century was minuscule, barely greater than the erosive forces trying to tear the blocks down, so that even over the course of a dryopithecine life span, if one of them had ever cared to keep track of changing landscapes, he would not have noticed that it was happening, even as it happened before his eyes. In a million years mountains grew ten thousand feet into the clouds, stopping trade winds in their tracks, collecting their moisture, and sending forth streams that, as they increased in age, merged to form the Nile River.

By 17.5 million B.C. Italy and Greece (formerly Mediterranean islands) were being driven like mighty nails into southern Europe, pushing up the Alps, whose highest peaks are today strewn with fossil cockleshells from the Mediterranean seabed. South and east of Greece the Earth's skin wrinkled and cracked under the mounting pressure, directing Crete, the Cyclades, and the volcanic isle of Thera. What had once been the Mediterranean Ocean was presently being squeezed so severely between two continental plates that by A.D. 15 million it would be entirely eliminated.\*

Around 17 million B.C. the dryopithecines broke out of Africa, crossing over on Arabia's first physical contacts with Turkey and Iran. As they spread north into Europe and east into China, the collision continued unabated

\*Under the stubborn persistence of the African plate, the Nile Delta will ram Cyprus and Turkey, and Libya will burrow under Greece and Italy, raising Rome, Athens, and Çatal Hüyük higher than the Himalayas.

Handwritten notes: 17.5 million B.C. Alps, Thera, Cyclades, Crete, Mediterranean seabed, dryopithecines, 15 million B.C. Nile Delta, Turkey, Iran, Libya, Greece, Italy, Rome, Athens, Çatal Hüyük, Himalayas.

behind them, plowing up mile after mile of basement rock and building mountain ranges on the plains of southern Iran and eastern Turkey, along the fringe of what, during an era of desertification, would come to be called the Fertile Crescent. Rain on the mountains began to feed the Tigris and Euphrates rivers, which, together with the Nile, would forever command the attention of dryopithecine descendants.

Handwritten notes: first and two cultures

The Nile, in particular, underwent astonishing transformations. In the west Morocco rammed Spain amidstships. The Earth crumpled there, pushing up a dam that cut off the Atlantic. The Mediterranean was (and is) two miles deep, and its rate of evaporation was (and is) so rapid that if the flow from the Atlantic were blocked, the sea could dry out completely over the course of seven centuries.\* 700 years

The story of the great Mediterranean dryout is recorded in the geology of Africa's oldest river and can be easily read if one looks closely enough. Under the Nile itself are the remnants of a deep valley to rival the Grand Canyon. River silts began covering it up as soon as the Gibraltar dam broke open and the Atlantic spilled in, but oil geologists drilling through thousands of feet of mud have located the solid bedrock of the Nile Canyon's floor. It lies nearly two miles beneath the city of Cairo.

For a brief time, for perhaps two or three thousand years after the dryout, the Nile poured over a cliff forty times higher than Niagara, but within a half million years, at a rate of inches per day, it had chewed back the bare limestone, slashing the Earth from Cairo to Aswan. The river ran east of Karnak in those days; the slash bypassed Karnak's limestone fields, left them intact for stonecutting beings, who were then only a distant potential in dryopithecine descent. In the river valleys north and east of Karnak, and two miles below it, reeds, papyrus, and tall stands of palms were sprouting. At a depth of two miles the atmosphere piled up 50 percent thicker than at Karnak. The more richly oxygenated air was probably healthier for creatures living in the canyon, but dense air trapped more of the Sun's energy, and beyond the shade of the palms, the oases must have been unbearably hot—up to 140°F on August afternoons. Isolated as it was from the rest of the planet, somewhat like Tibet's mythical Shangri-la, the Nile Canyon

\*Samples of alternating layers of mud and salt beneath the Mediterranean floor tell us that the sea has dried out several times. More than a million years of fossils lie undiscovered on the drowned Mediterranean basin—especially in the remnants of the Nile Canyon. The lost Nile probably ranks among the most exciting paleontological treasure chests anywhere on Earth, but the field of deep-sea paleontology has not been born yet and must await the further development of robots now being built for the emerging science of deep-sea archaeology.

Handwritten notes: Now that is global warming

Handwritten note: THE FUTURE OF SCIENCE.

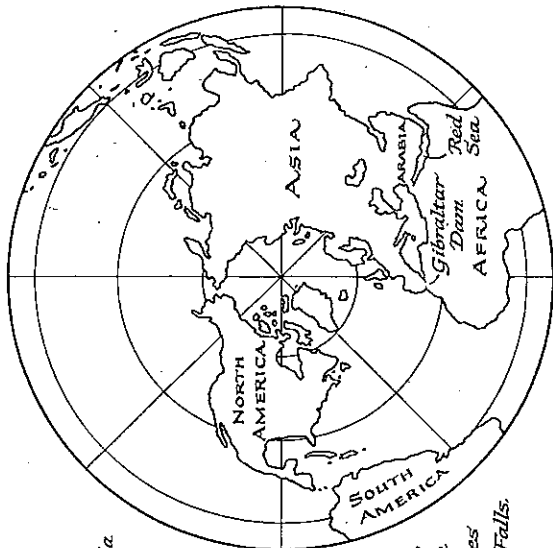


*The Northern Hemisphere: 35 Million B.C.*



*The Northern Hemisphere: 18 Million B.C.*

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*By 10 million B.C. Arabia had collided with Iran and Turkey, initiating faunal exchanges between Africa and Asia. Morocco's impact with Spain produced a natural dam, behind which the entire Mediterranean Sea dried up, and the Nile became a waterfall forty times higher than Niagara Falls.*



*The Northern Hemisphere: Present-day*

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was among the most remarkable habitats the world had ever seen. In the thicker air, ordinarily harmful mutations that reduced the lengths of wings took on new meaning. Even stubby-winged birds, even today's gliding snakes and squirrels would have been graceful fliers on the canyon floor. We do not know if some branch of the dryopithecine clan lived there or if we owe some part of our origins to the canyon, but we do know that the Nile flowed north under Cairo, carrying river silt over Mediterranean salt flats as far away as Crete (the river's banks can still be seen today on the actual bottom of the Mediterranean Sea). On Crete the fossil bones of dog-size hippos, shrews, and elephants provide only random snapshots of a few creatures that happened to venture up from the basin. Wandering into alpine bogs, they drowned and fossilized when the islands of Crete and Thera were forest-crowned mountains whose foothills lay at the northernmost reaches of the Nile oasis. There can be no doubt that the inhabitants of the Nile began to evolve in strange, new directions, but they and their world lay in the path of the Atlantic Ocean's inevitable breach of the Gibraltar dam, and about 6.5 million B.C. there came a deluge of such proportions that the biblical parting of the Red Sea might easily have been dwarfed by one of its eddies, as a raindrop is swallowed by the ocean.

As new mountains and rivers were born, as the Nile Canyon drowned and silted over and as the continents shifted into positions resembling a freehand sketch of a modern map of the world, the dryopithecines underwent equally dramatic transformations. The stage was now set for an instance of migration and diversification that would produce the most extraordinary lineages seen on Earth since the rise of the dinosaurs. Within a million years of the dryopithecine breakout, they had extended their range from Africa to Spain and Portugal in the northwest, to China and Thailand in the Far East. South African, European, and Asian dryopithecines were as separated by sheer distance as by the new mountain ranges and deserts forming between them. Slowly, at about the rate mountains are erected, genetically isolated populations began to drift in different directions.\*

\*A million years after the dryopithecine breakout from Africa, new creatures began depositing scraps of skull in the fossil-bearing strata of northern Pakistan. Seen from a paleontological perspective, in which adjacent layers of mineralized mud and bone will mark off, at most, an interval of fifty thousand years, a million years is but a fortnight. In a layer of African sediment dating from about 17 million B.C., one finds only dryopithecine bones. In the very next layer, in Asian bone fields only a million years younger, at least two new branches have been added to the dryopithecine family tree. They have been named *Ramapithecus* and *Sinapithecus* (after the Hindu deities Rama, the preserver, and Siva, the destroyer). The sinapithecines very closely resemble the modern Asian genus *Pongo* (the

In 4 million B.C. reptiles still held dominion over the best parts of the Mediterranean world. Slowly, and with ~~eroding~~ <sup>drifting</sup> force, a global deterioration of the climate had begun to build giant ice sheets and to deflect trade winds in odd directions. Rain patterns changed. Then, as drought swept across east Africa and savannas degenerated into deserts, the cobras, deadliest of the snakes, found their territory reduced to a strip of land only twelve miles wide. For more than two million years they continued to hold sway over a narrow band of palms and tall grasses that twisted with the Nile through a thousand miles of drifting sand.

Then, as they slid and weaved along paths that they had used for tens of thousands of generations, as they prospered on good hunting for mammals gathering around water holes, occupied the limestone crevices near Karnak, and multiplied into living masses of snakes, a newer, more terrifying creature came into their world and instantly challenged their authority. THEY / S OVER

The toolmakers had no poison glands and could not strike as quickly as a cobra, but they carried sharpened sticks and could loop hemp snares at the ends of long poles, and in time they would master fire and cook cobra meat in their hearths. Charred cobra vertebrae buried in prehistoric campfires suggest that one of man's first and most symbolic acts in the Nile Valley was the killing of the snake. NEW DOMINATION.

As a symbol of power the cobra would, in ages to come, be respected above all other creatures of the Nile. Its likeness would be found on the walls of Thebes, on its altars, and on the headdresses and golden death masks of pharaohs. ANCIENT EGYPT.

Across the river from Thebes, in the Valley of the Kings, frescoes in the tomb of Sethos I (Seti) tell a strange story. Snakes on the wall have been painted with legs and scaly feet. They grin menacingly, and the accompanying hieroglyphs indicate an ancient knowledge that snakes were not always without legs. According to the Sethos I inscriptions, "the serpent's fore-bears possessed feet." It seems reasonable to conclude that the Egyptian priests and scholars must have dissected snakes and that the vestiges of limbs

EVIDENCE OF SCIENCE AND BELIEF / UNDETERMINED  
OR EVOLUTION 10,000 YEARS AGO?

*Ramapithecus*, once thought to possess a mixture of ape and human characteristics, seems to have been related only to *Sinapithecus* (to judge from the structure of its skull), making it part of a genus (or group of species) that came in various shapes and sizes and whose only surviving branch is the orangutan. Elsewhere in Africa, Europe, and Asia other branches continued to split and meander. By 4 million B.C. they had begat gorillas, chimpanzees, and the australopithecines. The australopithecines, in turn, branched into three major new directions (and probably at least a half dozen others not yet known from fossils), of which we appear to be a lucky side branch, one of only a small handful of still-living twigs on a once-luxuriant dryopithecine tree.

Look for DRYOPITHECINE  
RAMAPITHECUS  
SWAPITHECUS  
EVOLUTIONARY PATHWAYS

Punishment:

ment is clear: Their legs were taken away, and henceforth they were obliged to crawl upon their bellies.

This is, of course, very reminiscent of God's punishment of the snake for its deception of man in the Garden of Eden. In Genesis 3:14 the Lord God says unto the serpent: "Because thou hast done this, thou art cursed . . . upon thy belly shalt thou go. . . ." Do you know THE BIBLES

The Sethos I account of the transformation of snakes predates the Bible SEE by a thousand years.\* Not only is it so similar to the Genesis account as to render a common origin extremely likely (especially when considered in the light of such additional Egyptian parallels as the four beasts of the Apocalypse before the biblical Apocalypse), it is surprisingly faithful to the scientific account of snake origins: They evolved from four-legged lizardlike ancestors.

In Genesis 3:15 God proclaims eternal enmity between the descendants of Eve and the descendants of the snake. Then, turning to the woman, he says: "I will greatly multiply the pain of thy childbearing; in sorrow thou shalt bring forth children." ← CAN YOU EXPLAIN THIS ONE?

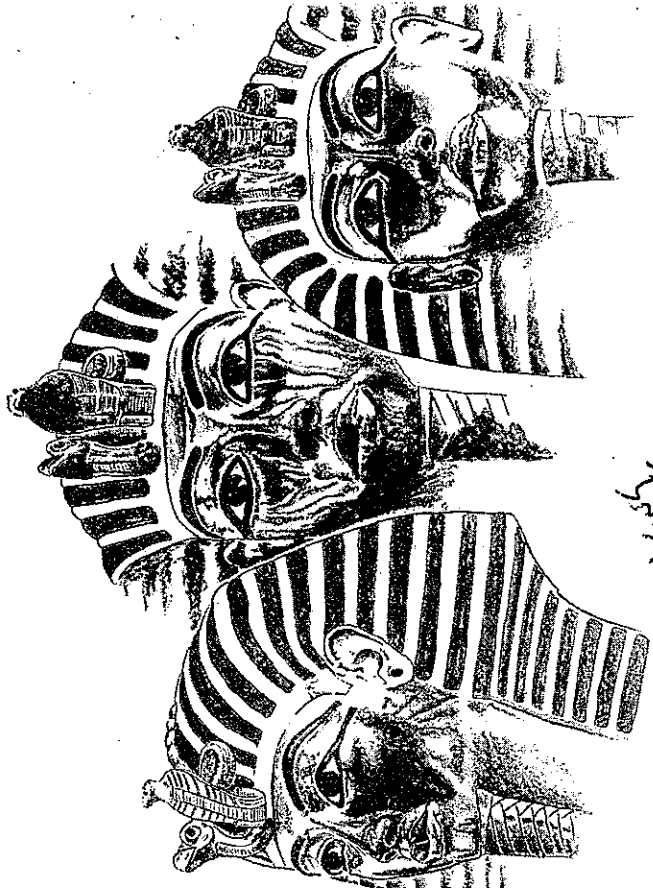
The story of Eve plucking the fruit of knowledge from a tree, of passing along to her descendants an expanded intelligence that would one day beget spears and rockets, and of God punishing her for this by causing human birth to be the most difficult in the animal kingdom is, like the story of the snake's missing feet, oddly akin to the scientific story of origins.

The most conspicuous trend in vertebrate evolution during the past hundred million years has been an increase in brain size (and the largest infant skulls—man's—have indeed produced the most painful births in the animal kingdom). Comparing changes in skull shape, and sweeping our eyes from end to end through Late Cretaceous time into the present, we can easily believe that the whole Earth has been trying to forge large brains.

Once the mammalian diversification began, brains enlarged in surges along lineages leading to kangaroos, cats, horses, whales, and dryopithecine apes. It was a pattern that, sooner or later, seemed bound to create thinking, toolmaking beings.

\*When scholars finally succeeded with the first translations of Egypt's mysterious hieroglyphs during the nineteenth century A.D., they were astonished to learn that ancient Egyptians had been speaking to us all along through the Bible. On the walls of tombs and in containers of papyrus scrolls were stories of Isis and the child of immaculate conception, of a Theban trinity (Isis, Osiris, Horus), of baptisms and resurrections. Farther east, Babylonian texts, including the Gilgamesh epic, also contained curious resonances, as when Gilgamesh, like Adam, was robbed of physical immortality and gained knowledge through the deceptions of a snake.

There are ancestors to even biblical stories.



Three views of Tutankhamun's golden death mask. The striped flaps extending along the sides of the pharaoh's face (which were worn only after his ascent to power) were an article of clothing designed specifically to mimic the shape of the cobra's head. Extension of facial flaps is the cobra's way of commanding attention and letting an adversary know that he is ready to strike if provoked. By copying the cobra's threat display in his headgear, the pharaoh was conveying a similar message—a very clear, nonverbal command for respect. When viewed in natural daylight, the god-king's death mask is revealed as the most haunting work of sculpture ever created by the hand of man. The artist used the reflective surface of the gold itself to produce facial lines that change as our point of view changes. Viewed from left to right, the pharaoh's expression changes from serene, to sad, to regal.

did not escape notice. Indeed, the builders of Sethos I's tomb were anatomically correct when they painted hind legs on snakes, precisely where the remnants of hipbones are located. SNAKES STILL HAVE THESE

SOUND FAMILIAR?

COULD BE

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And so, around 15 million B.C. the first toolmakers occupied the Nile, the Tigris, the Euphrates, and the land between the three rivers.

It was not a hospitable land, that day when our ancestors arrived. A tribe could wander east from the Nile or west from the Euphrates for weeks and never find enough water to survive. For twenty million years Egypt, Arabia, Israel, and Iraq had lain across a fracture point in the uneasy marriage of continental plates. It was a land of earthquakes and violent climatic upheavals. In millennia past, deserts had been overrun by swamps, and the swamps had subsequently shriveled into deserts. Hundreds of feet below the Arabian wastes, underground streams flowed as vast as seas. Wherever the desert floor dipped below sea level, the waters bubbled forth as springs and whole forests of palms sprouted on landscapes otherwise as lifeless as the sands of Mars.

It was a cruel, desolate land, subject to nature's wildest whims. In just one million years canyons two miles deep had come and gone, and even as the toolmakers moved in, a mountain near the river Jordan was torn apart and tipped on its side. Within the mountain, where a huge fissure had opened and snapped shut—a fissure through which construction workers of the twentieth century A.D. would eventually cut a road—lay the crushed skeleton and stone tools of a man who, in the hour of his death, had witnessed geologic manifestations of which his distant descendants could scarcely dream.

The toolmakers were the inheritors of 4.6 billion years of continental wanderings, upliftings, and degradations. Everything they set out to accomplish would be either aided or hindered by what had happened to the land during those vanished years. Here and there dissolved gold had percolated up through volcanic steam vents and condensed into crystalline veins. In the deserts of Sinai, mountains of copper had been pushed up from somewhere far below. They were slowly being weathered into blue-green sediments and redeposited over a wide area. Ancient seabeds had risen across Egypt, exposing outcrops of marine limestone from which Theban columns and the Sphinx would be cut. The Red Sea and the Bitter Lakes looked much as they do today. They were a crack in the world, where a new ocean had begun to form, nudging Egypt and Israel in opposite directions. The Gulf of Aqaba, the Dead Sea, and the Sea of Galilee were mere pits along the crack's eastern branch. From the south of Israel, north to Turkey, human activity was confined to a narrow strip of land pressed between the Mediterranean Sea and an equally formidable sea of sand. The strip formed the only

THE EARTH IS ALWAYS CHANGING

corridor between Asia (the Tigris-Euphrates) and Africa (the Nile), and from the start its pastures must have been fiercely contested. Beneath the corridor, and beneath the sands to the east, lay seas of oil, which would one day be valued even more than green pastures, even more than gold.

Toward the end of the third millennium B.C. mighty cities were going to rise up along the Nile, in Iraq's land of two rivers, in Syria, and on the Aegean. As these powers swelled and inevitably pressed against one another, the place where they collided would be Israel. From that moment armies, not just continents, would meet and clash. While the stage was being set, even before the actors existed, geography had dictated that human history would be every bit as violent as the geologic history that had preceded it. The shiftings and groanings of the Earth itself had set the stage for a focus of human forces.

AND STILL DO. FROM THE FIRST HUNTERS WHO WERE TRYING TO SECURE THE EXPOSURE TO THE FIRST PASTURES & SHEPHERDS TO MODERN NATIONS.