

Hunted animals tend to shrink in size through the ages, while those that live in security increase in stature. Most of the wild beasts we now classify as "big game" were much larger in pre-historic times.



The extinct  
sabre-tooth tiger  
was actually a  
giant wildcat.

The famous ancient Irish  
Elk had an antler spread  
of eleven feet!



Ferocious prehistoric  
lions, twice as  
large as lions of  
today, roamed in  
southern Germany.



The great Aurochs,  
wild ox of Europe, that survived  
in the Baltic Countries until the Middle Ages,  
was twice as big as an American Bison.

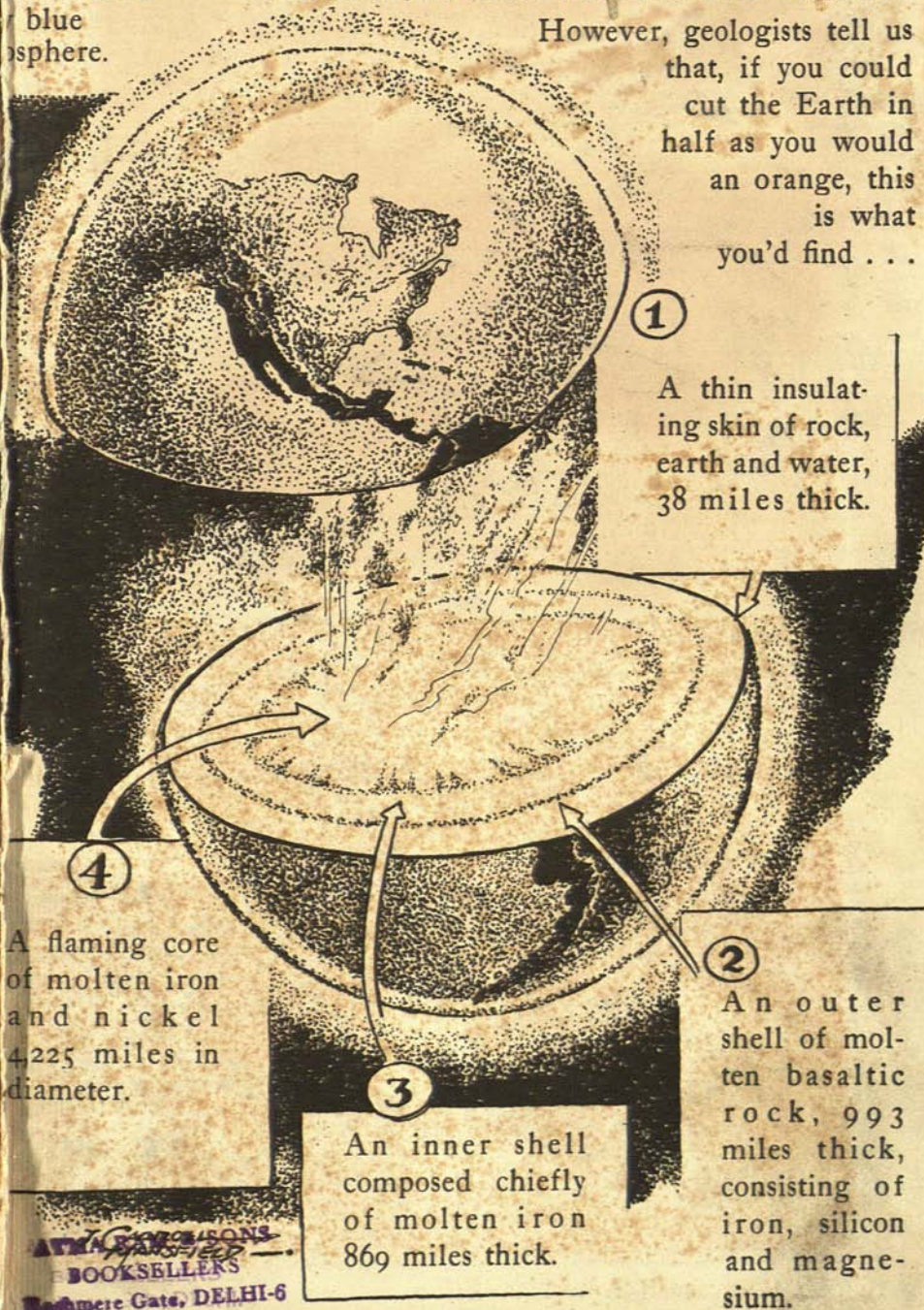


## WHAT'S INSIDE THE EARTH . . . ?

"halo" around  
Earth is its  
blue  
sphere.

Until 1774 it was generally believed that the  
interior of the Earth was filled with water . . .

However, geologists tell us  
that, if you could  
cut the Earth in  
half as you would  
an orange, this  
is what  
you'd find . . .



1  
A thin insulating  
skin of rock,  
earth and water,  
38 miles thick.

4  
A flaming core  
of molten iron  
and nickel  
4,225 miles in  
diameter.

3  
An inner shell  
composed chiefly  
of molten iron  
869 miles thick.

2  
An outer  
shell of molten  
basaltic  
rock, 993  
miles thick,  
consisting of  
iron, silicon  
and magne-  
sium.



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DAWN OF CREATION







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# DAWN OF CREATION



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BY

J. CARROLL MANSFIELD

Author of "Highlights of History"

*Illustrated by the Author*

571  
Man.

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# CONTENTS

	<i>Page</i>
MAN'S STORY INCOMPLETE . . . . .	1
DEAD-END OF HISTORY . . . . .	2
WHERE HISTORY COMES FROM . . . . .	3
THE BEGINNING OF HISTORY . . . . .	4
IGNORANCE OF PREHISTORY . . . . .	6
UNEXPLAINED DISCOVERIES . . . . .	7
BURIED CENTURIES . . . . .	8
THE RIDDLE OF THE FOSSILS . . . . .	9
FOSSILS AND FACTS . . . . .	10
MOUNTAINS FORMED BY UPHEAVALS . . . . .	14
THE GEOLOGICAL STAIRWAY OF LIFE . . . . .	15
HOW THE EARTH WAS BORN . . . . .	18
THE NEBULA THEORY . . . . .	20
THE EARTH COOLS . . . . .	21
THE EARTH'S CRUST FORMS . . . . .	22
THE PROTEROZOIC AGE . . . . .	23
MYSTERY OF LIFE . . . . .	24
PROTEROZOIC MIRACLE . . . . .	25
FABRIC OF ALL LIVING THINGS . . . . .	26
ELEMENTARY FORMS OF LIFE . . . . .	27
THE FIRST FOSSILS . . . . .	28
THE FIRST EYES . . . . .	29
TRILOBITES AND SEA SCORPIONS . . . . .	30
THE AGE OF FISHES . . . . .	31
MARINE PLANTS INVADE THE LAND . . . . .	32
A LESSON FROM THE FROG . . . . .	35
THE AGE OF REPTILES . . . . .	38
BOUNCING BEHEMOTHS . . . . .	40
KILLER-DINOSAURS . . . . .	42
ARMORED VEGETARIANS . . . . .	43

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San Dehu

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	<i>Page</i>
FLYING LIZARDS AND SWIMMING BIRDS . . . . .	44
EARLY BIRDS . . . . .	45
MESOZOIC SEA SERPENTS . . . . .	46
A CHANGING WORLD . . . . .	48
CONTINENTS ADRIFT . . . . .	49
THE FIRST MAMMAL . . . . .	52
THE CAINOZOIC AGE . . . . .	55
FURTHER GEOGRAPHICAL CHANGES . . . . .	58
THE COMING OF MAN . . . . .	62
MAN EMERGES FROM THE ANIMAL . . . . .	63
HOW A BOOK CHANGED THE THINKING OF THE WORLD . . . . .	64
THE SEARCH FOR THE MISSING LINK . . . . .	67
JAVA MAN . . . . .	68
OTHER SUB-MEN . . . . .	71
TRACES OF MAN'S ANIMAL ANCESTRY . . . . .	74
NEANDERTHAL MEN . . . . .	75
LESSONS FROM LIFE . . . . .	82
MAN LEARNS TO TALK . . . . .	83
A GARDEN OF EDEN . . . . .	84
THE ICE AGE . . . . .	86
MAN BEGINS TO THINK . . . . .	89
THREE GREAT NECESSITIES . . . . .	90
MAN'S HOME AND CASTLE . . . . .	92
THE OLD STONE AGE . . . . .	93
THE FIRST TOOLS . . . . .	94
THE SPEAR . . . . .	96
TRAPPING THE MAMMOTH . . . . .	98
MAN DISCOVERS FIRE . . . . .	100
THE NEANDERTHAL STORY ENDS . . . . .	104
CRO-MAGNON MAN . . . . .	105
EARLY MEDITERRANEAN RACES . . . . .	106
THE RISING OF THE WATERS . . . . .	107
CRO-MAGNON MAN IN WESTERN EUROPE . . . . .	109
CRO-MAGNON INVENTIONS . . . . .	110
THE BOW AND ARROW . . . . .	112
CRO-MAGNON CAVE PAINTINGS . . . . .	113
PALAEOLITHIC LIFE WITH FATHER . . . . .	116
EARLY LOVE OF FINERY . . . . .	124



	<i>Page</i>
PALAEOLITHIC PLAY . . . . .	125
FEARS AND SUPERSTITIONS . . . . .	126
WITCH-DOCTORS AND MEDICINE MEN . . . . .	127
OLD AGE AND DEATH IN THE OLD STONE AGE . . . . .	128
PREHISTORIC MEN IN THE NEW WORLD . . . . .	129
AN ARROWHEAD AND THREE THOUSAND YEARS . . . . .	130
THE SAGA OF FOLSOM MEN . . . . .	131
THE FIRST CHIEF . . . . .	132
BROAD-HEADED IMMIGRANTS . . . . .	133
MAGDALENIAN CARVING . . . . .	135
BASKET MAKING . . . . .	137
THE INVENTION OF POTTERY . . . . .	138
THE DOMESTICATION OF ANIMALS . . . . .	141
MAN'S FIRST ANIMAL ALLY, THE DOG . . . . .	142
WILD GAME OF NEOLITHIC EUROPE . . . . .	144
THE DOMESTICATION OF GOATS . . . . .	145
NEW FOODS — MILK AND CHEESE . . . . .	146
THE FIRST CONTROLLED FOOD SUPPLY . . . . .	147
FROM HUNTER TO HERDSMAN . . . . .	148
THE FIRST MAN-MADE DWELLINGS . . . . .	149
THE TAMING OF THE HORSE . . . . .	150
PREHISTORIC BARNYARD ANIMALS . . . . .	151
THE NEOLITHIC, OR NEW STONE AGE . . . . .	154
SPINNING AND WEAVING . . . . .	155
THE FIRST CIVILIZATIONS . . . . .	157
RACES OF MEN . . . . .	158
GROWTH OF NATIONAL TYPES . . . . .	159
THE BEGINNING OF AGRICULTURE . . . . .	160
BREAD . . . . .	162
THE HARVEST . . . . .	163
THE FIRST VILLAGES . . . . .	164
THE FIRST ARTISANS . . . . .	166
THE FIRST LAWS . . . . .	167
SIGNS AND OMENS . . . . .	168
PRIVATE AND COMMUNITY PROPERTY . . . . .	169
THE FIRST PERMANENT HOUSES . . . . .	170
THE FIRST WARS . . . . .	172
HUMAN BONDAGE . . . . .	174

	<i>Page</i>
THE CONQUEST OF WATER . . . . .	176
FROM BOWL TO BOAT . . . . .	177
MAN AND THE MACHINE . . . . .	180
THE LEVER AND THE FULCRUM . . . . .	182
INCLINED PLANE, ROLLER AND WHEEL . . . . .	183
MAN BEGINS TO TELL TIME . . . . .	184
HOW A SWISS MYSTERY REVEALED THE PAST . . . . .	186
THE RIDDLE OF THE AZILIANS . . . . .	192
KITCHEN MIDDENS . . . . .	193
PREHISTORIC KNOWLEDGE OF THE WORLD . . . . .	194
NATURE WORSHIP AND TRIBAL GODS . . . . .	195
TABUS . . . . .	196
SUN WORSHIP . . . . .	198
THE DRUIDS — HUMAN SACRIFICE . . . . .	199
DOLMENS AND BARROWS . . . . .	201
TRIBAL TRIBUNALS . . . . .	202
TRADE AND CURRENCY . . . . .	203
THE LIGHTER SIDE OF LIFE . . . . .	204
THE FIRST MUSICAL INSTRUMENTS . . . . .	205
EARLY MECHANICAL DEVICES . . . . .	206
GROWTH OF CITY-STATES . . . . .	207
THE RISE OF KINGS . . . . .	208
NEOLITHIC MARRIAGE . . . . .	210
MAN Discovers Metals . . . . .	211
BRONZE AGE TOOLS . . . . .	214
EGYPT ON THE EVE OF THE HISTORIC ERA . . . . .	218
WHY THE EGYPTIANS PRESERVED THEIR DEAD AS MUMMIES . . . . .	222
MESOPOTAMIA . . . . .	223
THE BEGINNING OF THE FEUDAL SYSTEM . . . . .	226
ORIGIN OF CASTES . . . . .	227
ANCIENT CONCEPTION OF THE EARTH . . . . .	228
BRONZE AGE CIVILIZATION CARRIED WESTWARD . . . . .	229
THE INVENTION OF WRITING . . . . .	230
THE REST IS HISTORY . . . . .	231
WHERE DO WE GO FROM HERE? . . . . .	232



## PUBLISHER'S NOTE

This book has been photographically reproduced from the American edition. The reader will therefore find that American spellings and expressions have not been changed. Nevertheless, special attention need only be called to the use of the word 'billion.' To English readers this term indicates a million millions and to Americans a thousand millions.

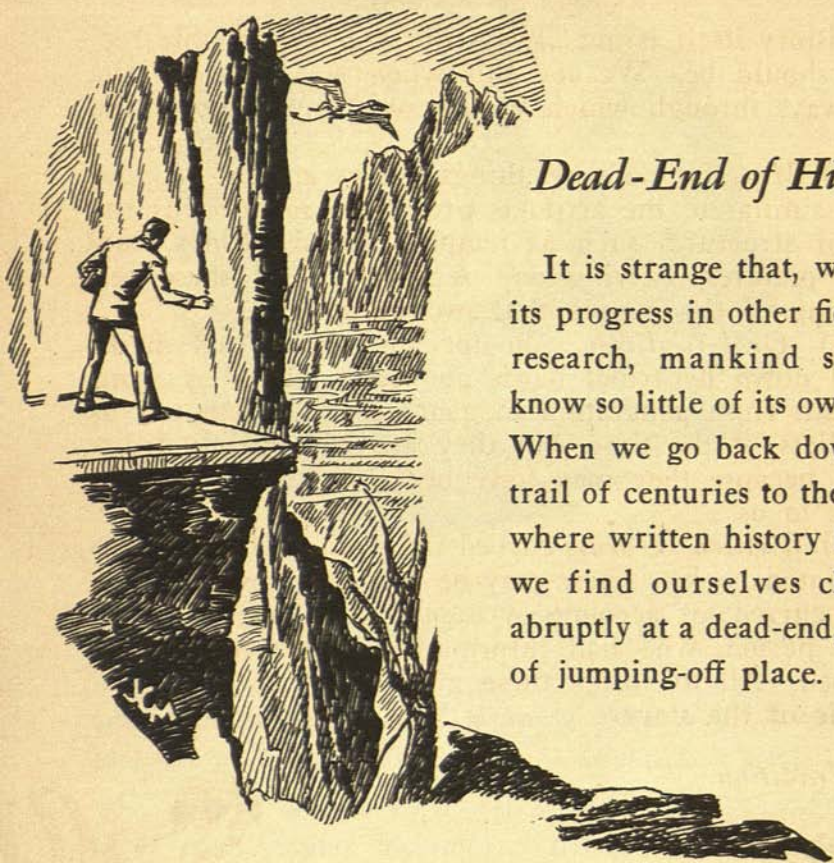






## MAN'S STORY INCOMPLETE

Suppose you were given a book to read, a volume entitled *Man's Adventures on Earth*, a complete story of the human race from the first men to the present, described as containing three hundred pages, each page covering a period of a thousand years. Then suppose that you opened the book and found it contained only the last six pages, and those almost the very end of the story. Except for a few tattered fragments here and there, the rest of the book—the most entertaining and instructive chapters for all you know—was entirely missing. Having read the six pages that were left of the book, would you not decide that you still knew very little about man's adventures on earth?



## *Dead-End of History*

It is strange that, with all its progress in other fields of research, mankind should know so little of its own past. When we go back down the trail of centuries to the place where written history begins, we find ourselves checked abruptly at a dead-end, a sort of jumping-off place.

Beyond this point, where the highway of history ends, we see at first glance nothing to help us probe into the more remote past except the time-worn relics that archaeologists call artifacts: crude weapons and tools, chipped from stone or carved from the bones of animals, bits of broken primitive pottery, and the silent skeletons of prehistoric humans who lived unknown ages ago.



## Where History Comes From

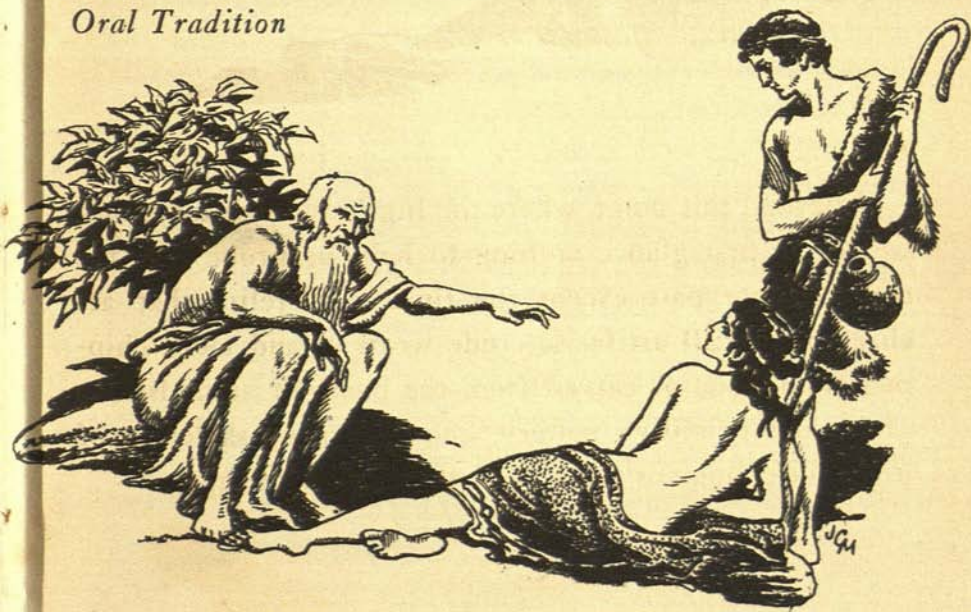
History itself is not always the orderly, reliable record it should be. We see this when we consider the three ways through which we get our knowledge of the past.

(1) *Material remains*: things left by ancient peoples, objects similar to the artifacts previously mentioned; the ruins of structures such as temples and dwellings, furniture, pictures, carving and sculpture. All these tell something of the people that produced them.

(2) *Oral tradition*: the legends, stories and myths handed down by tribal bards and story-tellers by word of mouth from generation to generation. These tell us the beliefs of the time, but they are not entirely trustworthy because they may have become garbled in their passage to us.

(3) *Written records*: carved inscriptions, manuscripts and printed books. These may be reports of events when they occurred, or accounts written by someone living in a later period, who had information of the happenings described. All too often these give but one side of the story.

### Oral Tradition





## *The Beginning of History*

The known past, the period of historic times, dates back some sixty centuries to the earliest written record yet found. How long before that man invented writing we do not know. Modern archaeologists would hail with delight the discovery of more ancient inscriptions that would extend our knowledge even a mere thousand years further back into the past.

Six thousand years of history take us back to Sumer and Akkad on the plain of Shinar, to Ur of the Chaldees, and Egyptian cities beside the Nile; fabulous places where remarkable civilizations were already in their prime. They boasted well-established social orders, governments, complex religions and codes of law, populous cities, whose inhabitants built ships and dug irrigation canals and studied medicine and astronomy. The wealthy enjoyed some luxuries not surpassed today, exquisite jewels and textiles, fine wines, marble baths, cosmetics and perfumes.



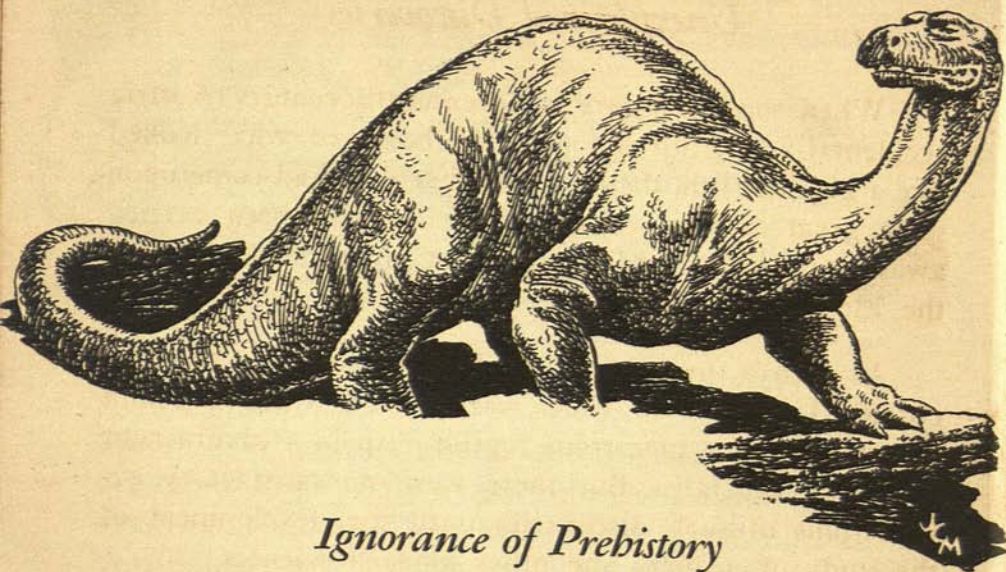




When the curtain rises on the historic era, we see nations that have already reached a high degree of culture and enlightenment. Such civilizations could not have sprung up overnight, as if by magic. They could only have been the accomplishment of countless centuries of slow growth, the gradual accumulation of a vast amount of knowledge and experience.

Geologists estimate that men have lived upon the earth for three hundred thousand years, and perhaps even much longer. Compare that immense span of time with the mere six thousand years that the story of mankind has been recorded, and what we now call "ancient history" seems only yesterday.

What of the missing chapters of the human story, the forgotten youth of mankind, and the long, lonely ages when the world itself was young? The unknown has always aroused man's curiosity, and the murky jungles of prehistory, veiled in the mists of time, stir our imagination and make us want to piece together the missing chapters. So we invite you upon our exploring expedition into the unknown past.



### *Ignorance of Prehistory*

A hundred and fifty years ago the world in general had no inkling that prehistoric men and great reptilian monsters had once roamed the earth. The absence of written records was not the only reason for this ignorance, or why nobody but a few inquisitive scholars gave a thought to such a possibility.

At that time the average man, busy with his own affairs and having little interest in scientific subjects, asked nothing beyond the beautiful Biblical stories of *Genesis*, Adam and Eve in the Garden of Eden, and Noah and the Flood, as the explanation of the beginning of things and the origin of man.

Pious men were puzzled and disturbed when, from time to time, in the digging of a mine or quarry, the stony skeletons of strange and stupendous creatures, the like of which men had never seen, were brought to light.

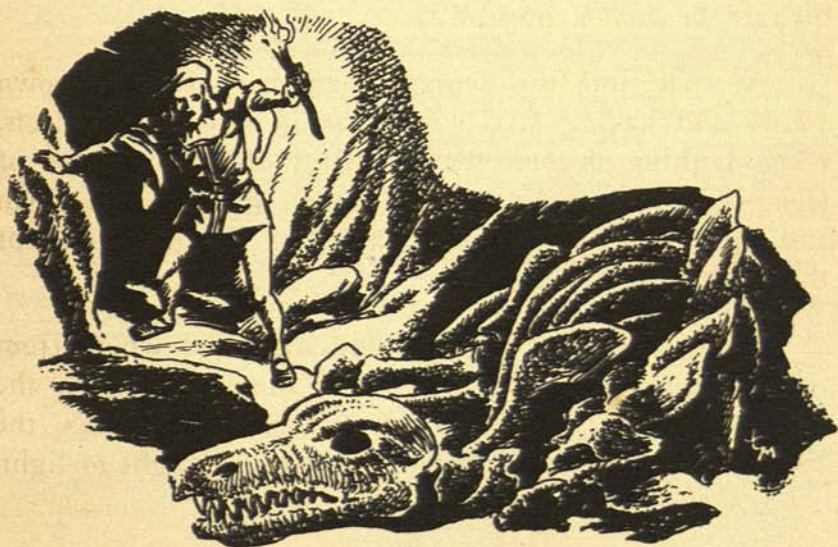


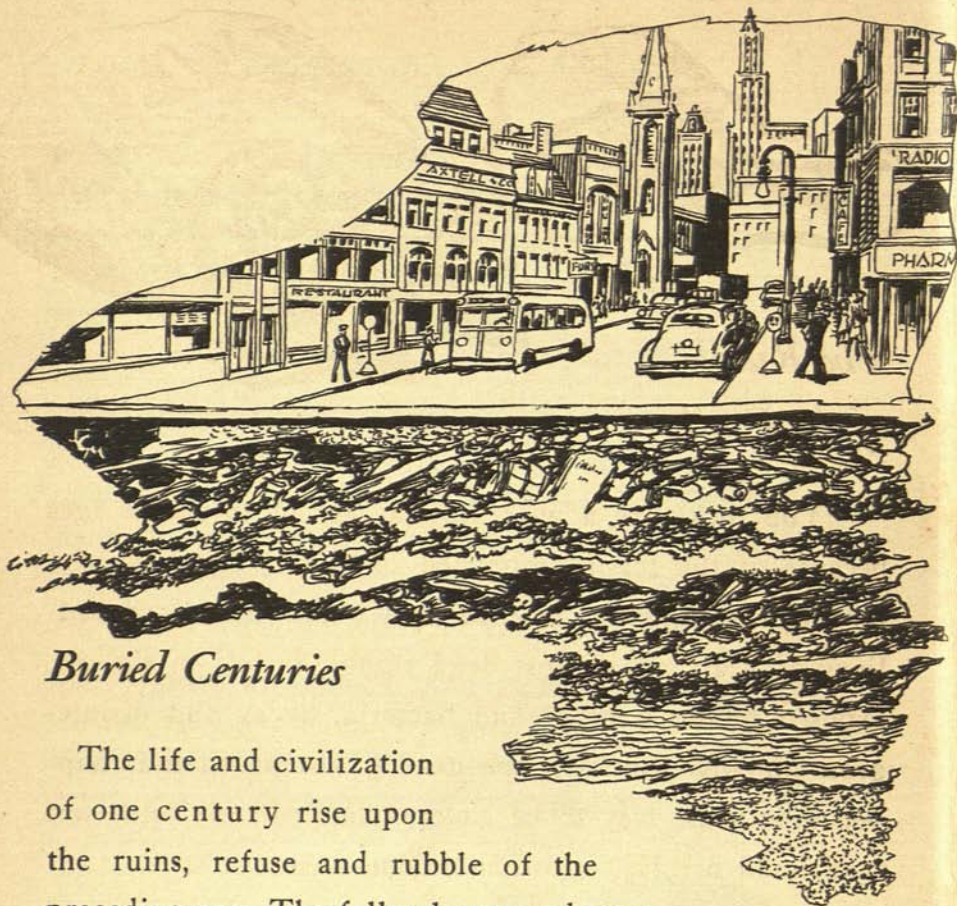
## *Unexplained Discoveries*

When some laborers in seventeenth century Austria accidentally dug up the petrified bones of what looked like a gigantic fish, they decided that they had come upon some great creature of the deep that had been carried away from the sea and stranded far inland at the time of the Flood mentioned in the Bible.

As a boy, the curiosity and imagination of the celebrated Leonardo da Vinci were stirred when he found the skeleton of a monstrous reptile deep in a cavern near his home in Italy. But there were no satisfactory explanations of such discoveries until the development of the study of geology and other kindred sciences.

It was not until late in the eighteenth century that scientists in France made the first attempt to reconstruct and classify the various species of strange, extinct animals that once had lived in western Europe.

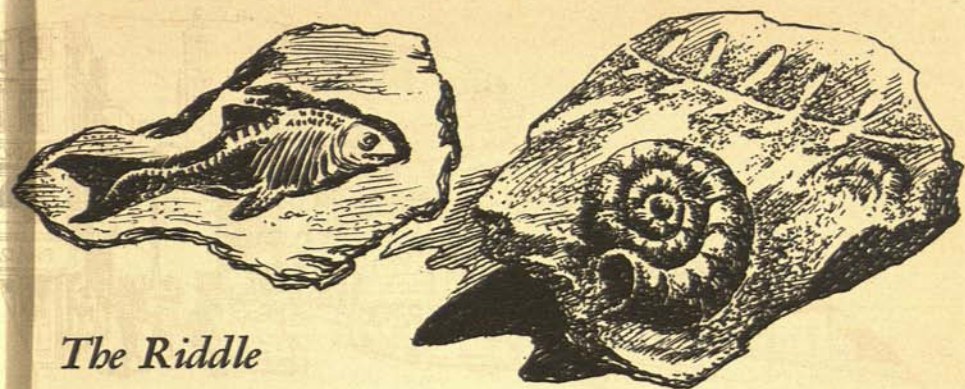




## *Buried Centuries*

The life and civilization of one century rise upon the ruins, refuse and rubble of the preceding one. The fallen leaves and trees, the withered vegetation of three hundred million Autumns, mingled with the bones and ashes of all the creatures that have lived since life began, together with the discarded, worn-out trappings and tumbled structures of man, have piled miles high upon the primeval crust of the earth. These ever-mounting layers of debris, moldering into dust and compressed by the ever-increasing weight above, gradually turn to stone. Therefore, we must look deep into the layers of rocks for traces of the remote past.





## *The Riddle of the Fossils*

The rocks are a guide to the life of forgotten ages because of the fossils imbedded in them. These are the petrified remains of creatures and plants that lived millions of years ago. Most dead things, if left in the air, exposed to the weather and bacteria, decay and disintegrate quickly. But, if some dead plant or animal happened in some way to be covered immediately with wet sand, mud or clay, it might become a stony fossil.

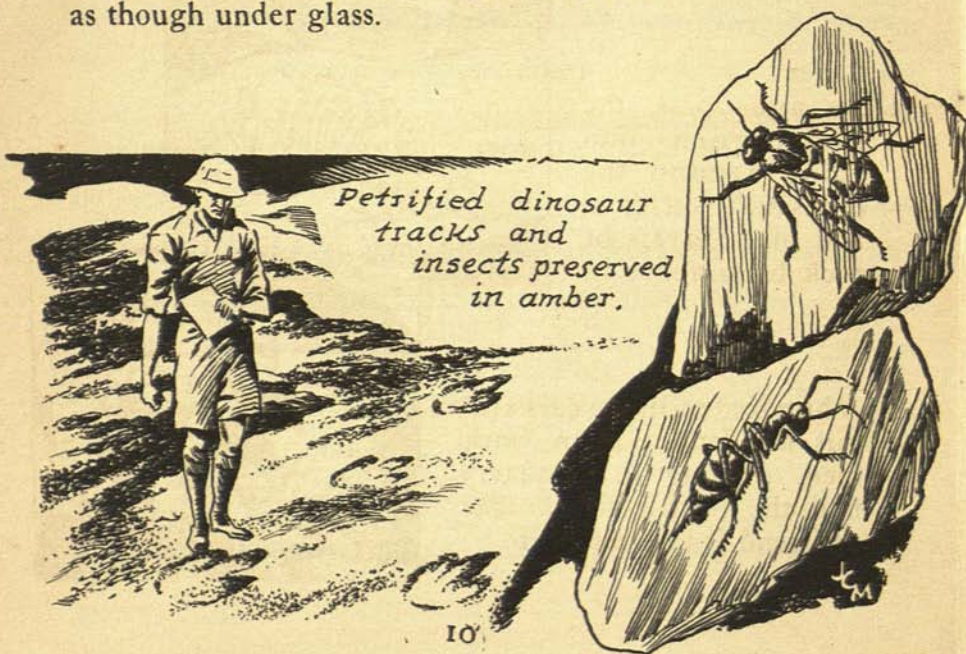
Fossils have excited men's curiosity since ancient times. Learned men in the sixteenth century concluded that fossils were evidence that in long ages past the world had undergone great geographical changes. But this school of thought was frowned upon by conservative scholars who maintained that fossils were the remains of creatures buried at the time of the Biblical Flood. However, the greatest thinkers clung to the belief that secrets of the long distant past were locked in the bowels of the earth.

## *Fossils and Facts*

By comparing the fossils in one layer of rock with those in the layers above it, we can see how various forms of life evolved and developed through the ages. They reveal how certain creatures turned into others entirely different, and show the intermediate stages in the long process of change. They also disclose in a startling manner how modern animals can be traced back to unsuspected remote ancestors.

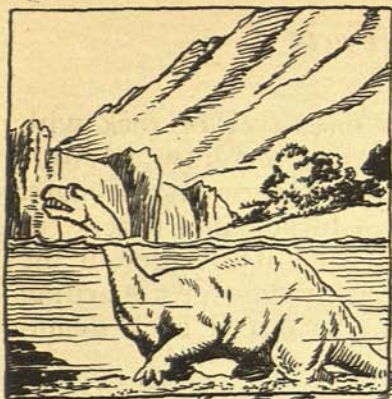
Fossils, however, are not the only clues to the long forgotten past. Such evidence as the footprints of long extinct reptiles and animals has been preserved where they walked in wet sand or clay that later hardened into stone.

Most fascinating of such exhibits are the ancient insects that were trapped in the flowing resin of certain trees, which, closing around them, sealed ants and bees from the air, and later turning to amber, preserved them in perfect condition for millions of years as though under glass.





## *How a Dinosaur Became a Fossil.*

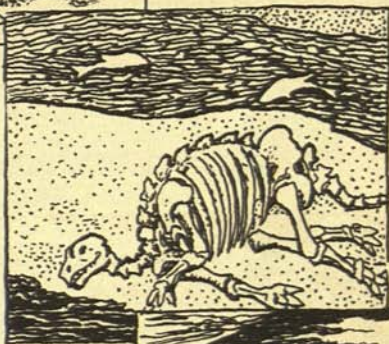


1. During the Age of Reptiles a dinosaur, wading in a river, gets stuck in the mud, and drowns.



2. The dead monster sinks into the mud at the bottom, and is soon entirely covered by silt washed down from the mountain.

3. As ages pass, the mud hardens into stone around the dinosaur's skeleton, and other layers of rock form above it.



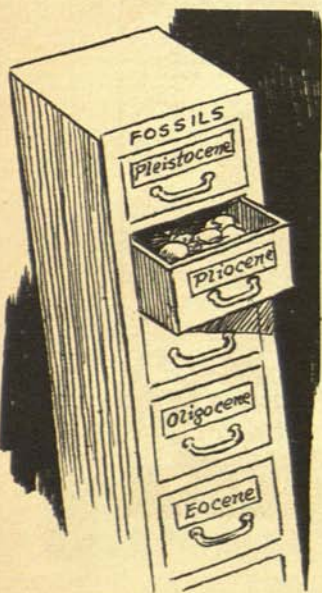
4. A hundred million years after this accident modern workmen, digging in a quarry, find the fossilized dinosaur, and send it to a museum.



An Englishman named William Smith (1769-1839) finally broke the shackles that had hobbled Geology. This tireless scientist tramped on foot all over the British Isles, examining and comparing the rock formations. His startling discoveries and his comprehensive geological maps provided a firm foundation for the new science, and earned for Smith the title "Father of Geology."



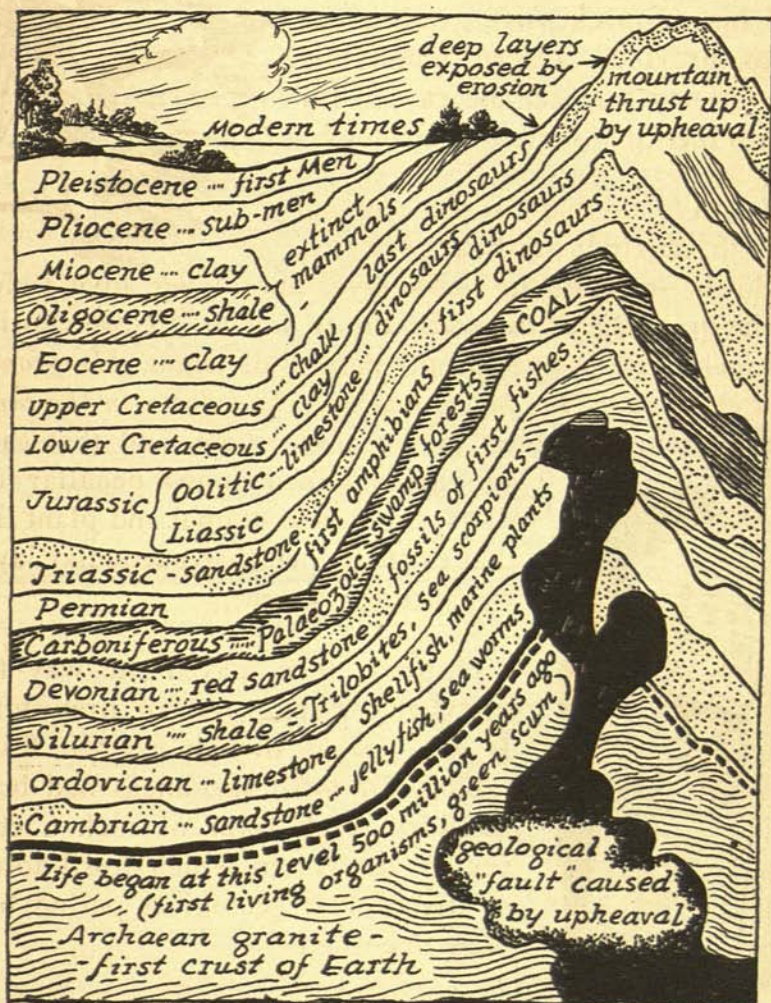
Smith found that just as the annual growth rings indicate the age of a tree, so do the strata of the rocks, layer upon layer, give a clue to the great age of the earth. Smith was the first to classify the rock strata in their proper natural divisions. *He proved that everywhere the layers had been laid down in the same order, from the oldest to the most recent, and that each stratum contained its own peculiar fossils, specimens of animal and plant life that existed when that particular layer was turning to stone.*



Geology, then, paved the way for study of the long ages of prehistory. It was just as though a great filing cabinet for fossil specimens had been provided, each layer of rock a convenient drawer in which fossil forms of life of that geological period had been deposited.



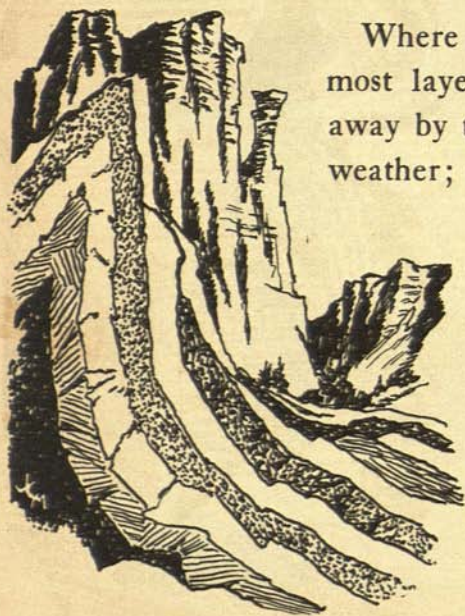
*The Rock Strata of the Earth, the corresponding geological periods and distinctive fossils of each period*



## *Mountains Formed by Upheavals*

Of course, since the deepest mines yet dug only go down to a depth of two miles, geologists cannot get straight down to the primeval layers of rock that lie many miles below the surface of the earth. Ancient convulsions of nature have aided them in overcoming this handicap.

Originally all the strata of rock formed in level sheets, or, to put it more aptly, like the skin of an apple. But due to internal upheavals and tremendous pressure from below and from the sides, the formerly rigid, horizontal layers buckled and folded in many places, and were thrust up, forming the great wrinkles on the earth's surface that are ranges of mountains.



Where this has happened, the top-most layers have gradually been worn away by the erosive action of wind and weather; thus exposing strata that once lay deep below the ground to the scrutiny of the geologist.



## *The Geological Stairway of Life*

*Each step a geological  
period, each  
flight of steps an Era*

The marvelous processes of world building take ages and ages. Modern scientists, basing their calculations on such factors as radio-activity, estimate that the earth has been two billion years in the making.

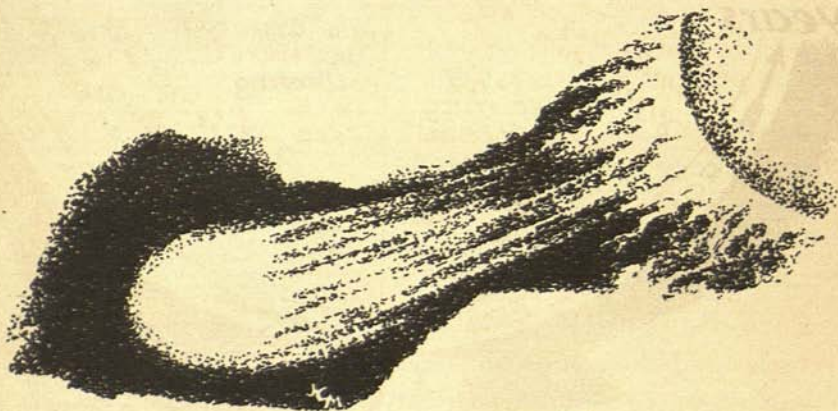
Two billion years! Such figures are too staggering for the human imagination to grasp. Lest they confuse us in exploring the vast epochs of prehistory, it is best to lay aside the familiar years, centuries and thousands of years, and adopt the geologist's more convenient time clock of periods, eras and ages.



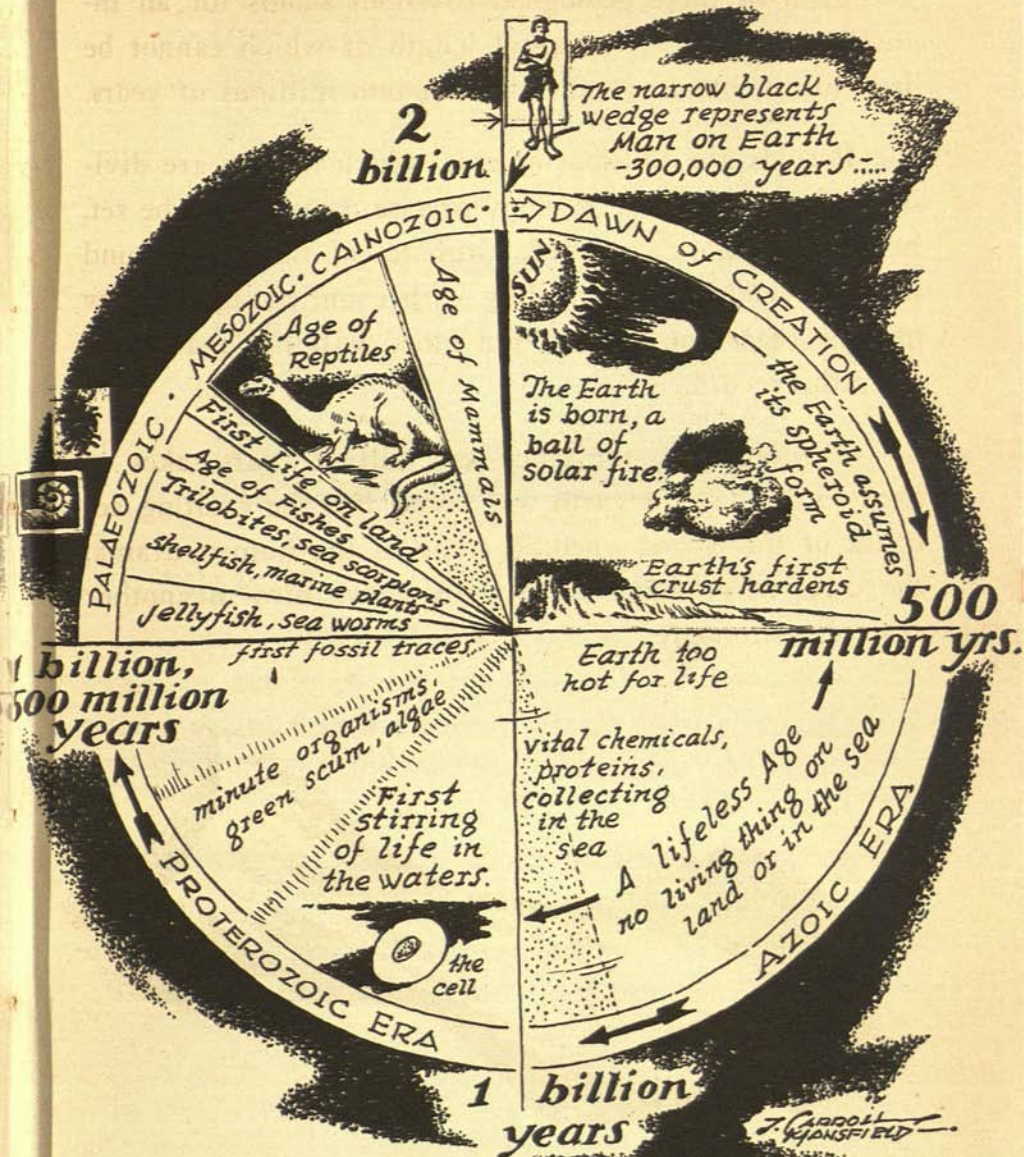
Each of these geological divisions stands for an incredibly long time, the exact length of which cannot be determined, but is assumed to run into millions of years.

Periods are divisions of eras, which in turn are divisions of ages. Since in geology precise dates cannot be set, but only roughly reckoned, estimates of time are bound to vary widely but, in dealing with countless ages, a few million years one way or the other will not materially alter the record.

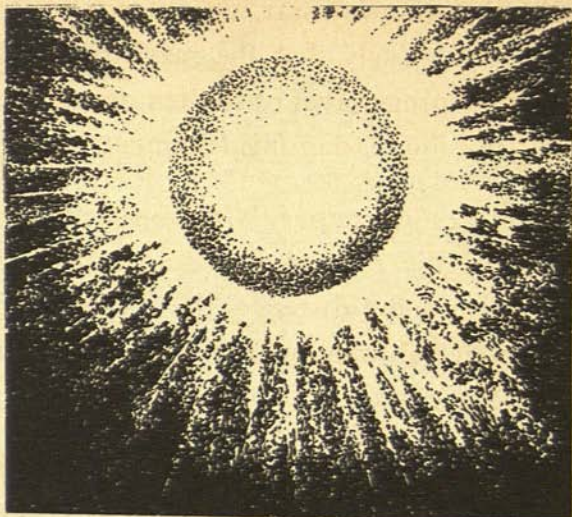
Turning back the clock two billion years takes us back to the day the earth was born. For the exciting account of this grand opening scene in the human drama, the creation of man's earthly home, we turn to another science, astronomy.







Geological Time Clock of the Earth's History



## HOW THE EARTH WAS BORN

Astronomers tell us that the planets of the solar system came into existence through a freakish celestial accident, and fix the date of this tremendous event at approximately two billion years ago.

At that time the sun, much hotter, more radiant than it is today, and rotating more rapidly, was a lonely orb, glowing in solitary splendor, too far removed from its nearest starry neighbors to have even a nodding acquaintance with them.

On this fateful occasion there flashed out of the cold blackness of infinite space a flaming ball of fire that, seeming to grow ever larger as it approached, proved to be a great wandering star, rocketing madly across the sky, and apparently headed directly for the sun.

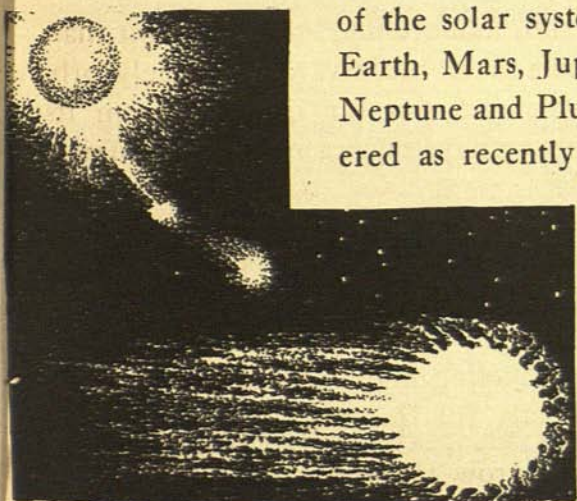


Happily, the runaway star did not crash into the sun, but shot past it so closely that the magnetic suction of its rush stirred up leaping waves of molten matter on the sun's surface, and drew huge, flaming fragments out into space.

Just as pieces of paper lying on a railroad track are sucked up by the rush of a passing express train, and drawn after it for some distance, the displaced chunks of molten solar material went whirling and tumbling in the wake of the roving star.

As the fiery wanderer sped away, its attraction diminished, and the falling fragments were arrested by the sun's gravitational pull and drawn into fixed orbits, or circular courses, in which they have continued to swing around the sun from that day to this, regularly as clockwork, as though attached to the mother-orb by invisible wires. There were, as far as we yet know, nine of these

great, flaming, fugitive masses of the sun that thus became the nine planets of the solar system, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto. Pluto was discovered as recently as 1930.





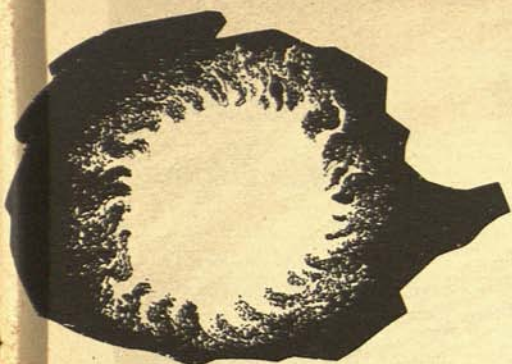
## *The Nebula Theory*

There are other, equally possible versions of this grand event. The nebula theory, proposed by the American astronomer Keeler in 1900, and since expanded by Chamberlin and Moulton, has gained many supporters. It advances the idea that our solar system grew out of a spiral nebula, like the Great Nebula in Andromeda (above), which certainly looks like such a system, with its central sun and circling planets, in the making.

A nebula consists of many large bodies called nuclei and clouds of tiny flaming meteors known as planetesimals, the whole group revolving like a vast merry-go-round. As the nebula revolves, the nuclei attract planetesimals to them by gravitational magnetism, just as dust is sucked into a vacuum cleaner.

The largest nucleus in the center becomes the sun of the future system, while the circling nuclei, continually enlarging by gathering all the planetesimals within the radius of their magnetism, grow to be planets.





## *The Earth Cools*

The great ball of fire that was destined to become the earth had plummeted some ninety-three million miles from the sun, when it was caught by the parent-orb's magnetism and pulled into a fixed orbit, where for ages it continued to spin like a dazzling Fourth-of-July pinwheel.

Comparatively nearby, a mere 238,000 miles from the earth, another, much smaller, fragment of the sun burnt out quickly, and became the earth's cold, lifeless satellite, the moon. Some seven hundred lesser sparks of the sun became asteroids or planetoids.

As time passed and the earth began to cool, its gaseous bulk shrunk in size as it increased in density and, due to its spinning motion, gradually took the shape of a spheroid, a sphere slightly flattened at the poles of its axis.





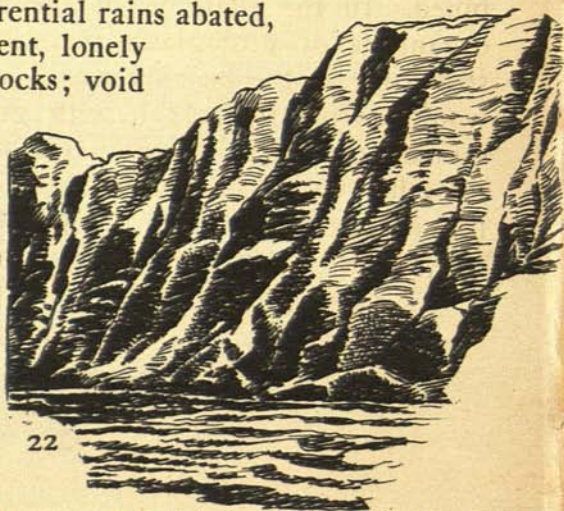


## *The Earth's Crust Forms*

As the internally convulsed earth slowly cooled, an ever-hardening, ever-thickening crust formed on its surface. Great masses of solidifying matter floated about on a heaving sea of molten metals and minerals like dumplings in a thick, boiling soup. Heavy clinkers of rock sank into the fiery depths, only to be blown up again. In this flaming crucible were formed many minerals that later were to be of inestimable value to man.

When the terrific convulsions had subsided, and a thin skin of stone covered the inferno beneath, the steaming vapors that enveloped the globe condensed, and drenched the earth's surface with constant downpours that hastened the cooling process, and filled all the hollows and depressions with hot lakes and seething seas.

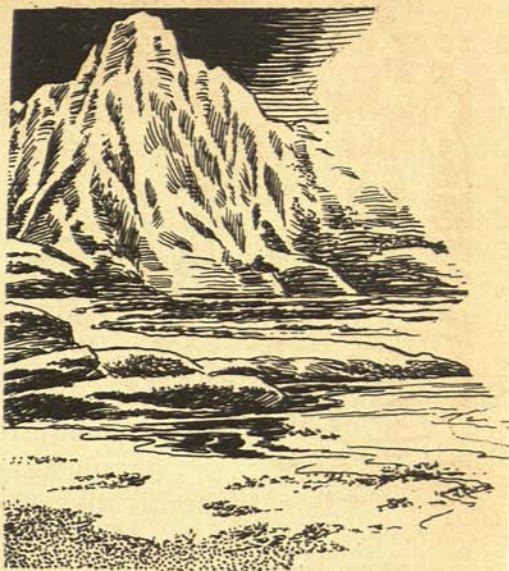
At long last the torrential rains abated, and the earth lay a silent, lonely place of stark, barren rocks; void of all life, no tree or blade of grass, not even soil covered the naked rocks. This dead and sterile period, that lasted five hundred million years, is termed the Azoic (Lifeless) Age.





# THE PROTEROZOIC AGE

More than a billion years had passed since the earth had been born as a flaming ball of solar fire. The stony outer shell, the original crust, had cooled and hardened, and most of the globe lay under water.



Here and there bodies of dry land rose above the waves; naked bluffs of granite, or jagged pinnacles of basalt, sloping down to broad beaches of sand and gravel. The land was still barren and lifeless.

Life first awoke in the warm waters, where many different kinds of chemicals, extracted from gaseous elements and dissolved from minerals, had collected and combined. In the shallows of the sea the first tiny living organisms of protoplasm were beginning to stir, while stranding on the beaches was a green scum that one day would carpet the earth with vegetation. Somewhere, somehow a chance combination of elements and conditions had produced the first tiny spark of throbbing, living energy that would eventually spread life over the world.

# Mystery of Life

No one can say exactly how life began. Perhaps the answer will forever elude inquisitive man's attempts to solve the riddle. But we of today know a great deal more about it than our grandparents or their grandparents.

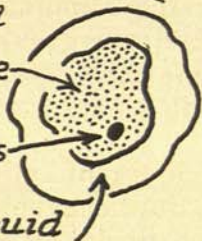
Modern biologists, students of living organisms, have traced life down the stairway of evolution to its lowest step, the microscopic cell. All living things, whether animals or plants, have sprung from cells.



nucleus  
enclosed  
in a  
membrane

nucleolus

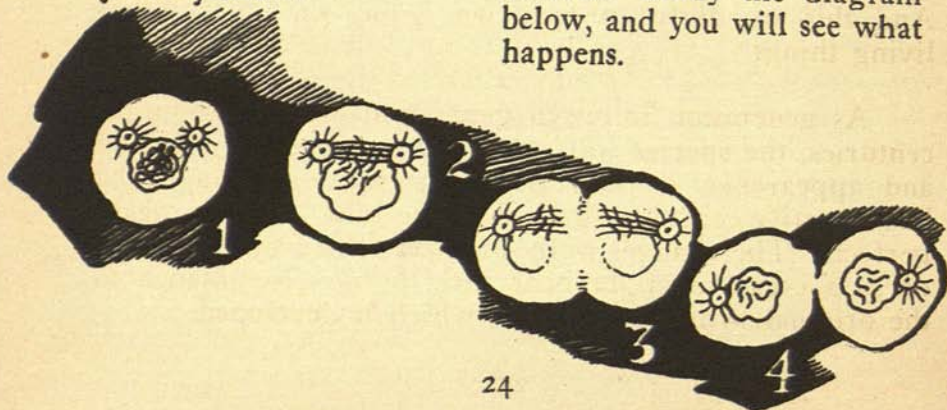
semi-liquid  
protoplasm



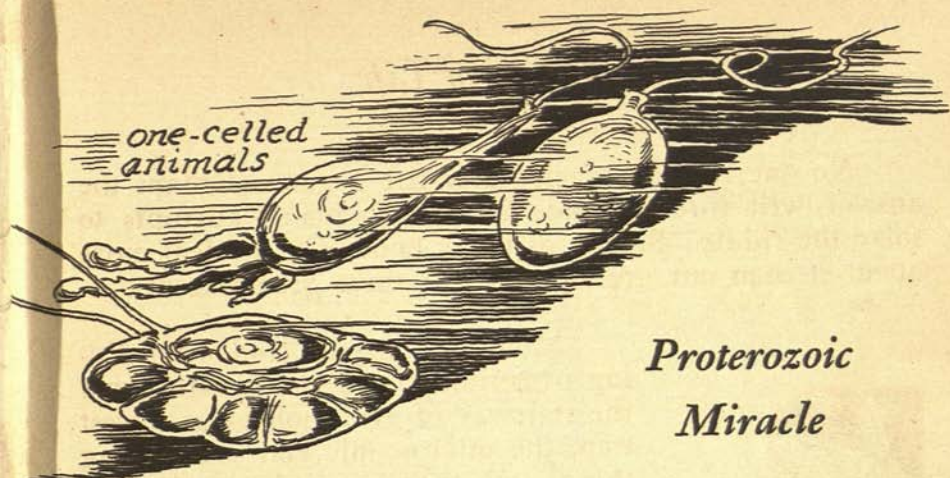
A plant cell, seen through a powerful microscope, looks somewhat like an ordinary hen's egg in a pan ready for frying. An animal cell resembles a hard-boiled egg.

## CELLS MULTIPLY BY DIVIDING

When a cell is about to divide, two little "stars" appear, one on each side of the nucleus. Study the diagram below, and you will see what happens.







## *Proterozoic Miracle*

Throughout the Proterozoic Age, over vast stretches of time, a breathtaking miracle was taking place over and over again.

Millions of microscopic cells learned to cluster together to form a solid, permanent, living community. Groups of cells, through constant repetition, came to perform certain special functions for the community. These groups, combined with other specialized groups, attained such harmony of action that in time each compact colony of cells became an individual living creature or plant.

Even more miraculous, each colony of cells produced seed-cells, from which grew other, duplicate colonies, multiplying and perpetuating this particular form of life. And this wonderful process was going on in all other living things.

As generation followed generation through countless centuries, the species was gradually improved in function and appearance, or increased in stature, as though the busy creative cells were guided by the rule "practice makes perfect." The changes were slow, yet after a million years or so a creature might bear little or no resemblance to the original form of life from which it developed.



## *Fabric of All Living Things*

Every living thing you see is made up of microscopic cells, billions of them. Look at a dog, a cat, a man, a tree. We see them as individual representatives of four different forms of life. What we don't see is that each is a marvelous colony of co-ordinating cells, developed in accordance with a definite pattern or design that has been carried on and improved through the ages.

Every human being is composed of some thirty billion cells! And, though we are not conscious of it, these cells that form the living tissue of our bodies are constantly wearing out and being replaced by new ones.

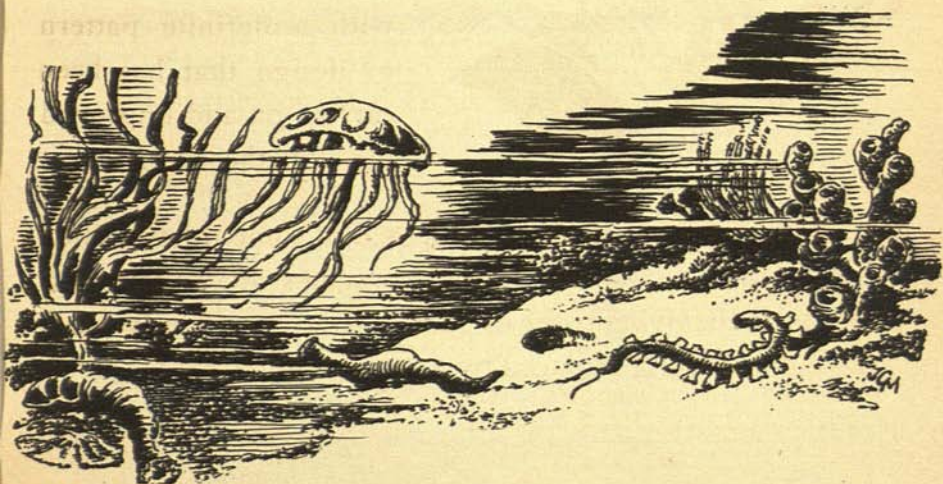


## *Elementary Forms of Life*

Of course, Mother Nature's first experiments with forms of life were of the lowest order, simplest construction and limited functions; soft, boneless, gelatinous things like jellyfish that floated aimlessly in the water, or blind sea worms that burrowed in the sediment on the ocean floor.

We know that such forms of life existed, for, though their bodies were too soft and perishable to be preserved as fossils, there are traces of worm burrowings in the rocks that immediately underlie those of the Cambrian period, and even jellyfish left impressions or castings of their forms in sand that later turned to sandstone.

At this time the first marine plants, also on a modest scale, were climbing upward toward the light. There were also strange growing things that were animals yet resembled plants, such as corals, sponges and anemones.





## *The First Fossils*

The first fossils are found in the sandstone that hardened during the Cambrian Period, five hundred million years ago. These were very simple forms of life, yet they were the remote ancestors of everything that has since lived on earth. Biologists have discovered that the lowly starfish was the original progenitor of all the vertebrates, including, of course, man.

Somehow these early boneless, spineless, brainless creatures acquired the instinct of self-preservation that has been uppermost in every living thing from that day to this. From the very beginning life was a never-ending struggle for existence. One creature devoured another.

Just how it started, we will never know, but the little, jelly-like animals began to absorb limestone particles from the water, and coat themselves, or surround themselves, with a hard, protecting cover of shell.

Thus the first shellfish came into being. After that it was the smart thing for all soft, boneless creatures, such as



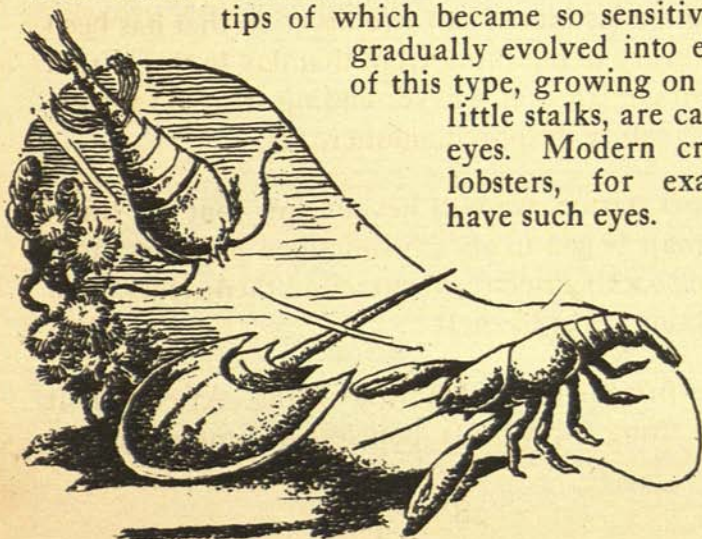
snails, oysters and clams, to wear armored turret tops, or even little domed houses lined with pearl. The first crustaceans, forerunners of crabs and shrimps, also donned horny coats of shell, and went about like armored knights.



### *The First Eyes*

During the long Cambrian Period and the Ordovician that followed, an even more startling advance of function, the faculty of sight, was being slowly developed. The way it came about was another of nature's miracles.

Up to this time all creatures had been blind; feeling their way around with delicate antennae or other touch devices. Some crustaceans had two little feelers in front, the tips of which became so sensitive that they gradually evolved into eyes! Optics of this type, growing on the ends of little stalks, are called stalked eyes. Modern crustaceans—lobsters, for example—still have such eyes.





*Trilobite*

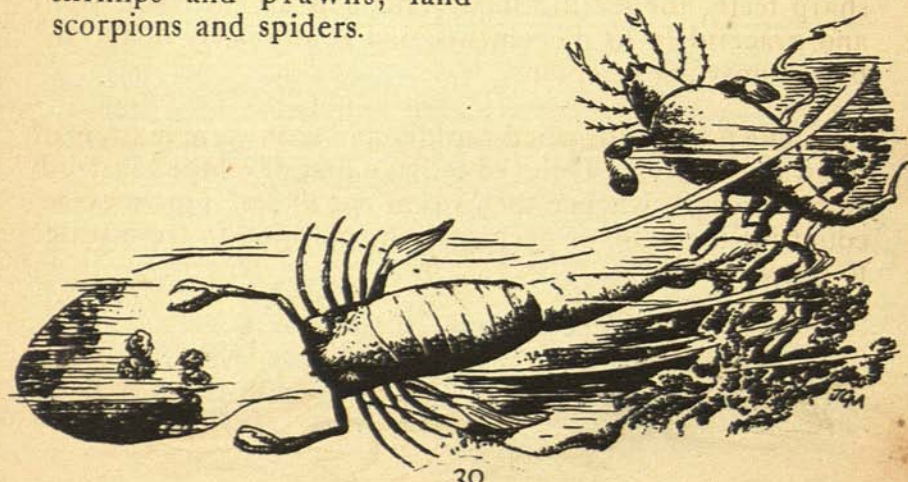
## *Trilobites and Sea Scorpions*

As millions of years dragged away while the Silurian shales were forming, natural change and growth were going on slowly but surely.

All life was still confined to the shallow waters, and the land remained a bare, uninviting expanse of naked rocks.

At this time the highest forms of life were the great Trilobites and Sea Scorpions, immense, stiffly-jointed, crab-like things that crawled on the sea bottom, or swam lazily and awkwardly among the waving water plants. Throughout this long and rather unexciting period, these big crustaceans ruled supreme.

The Trilobite finally became extinct; some of its distant cousins changed into crabs. The sea scorpion was the ancestor of many species, including the king crab, lobsters, shrimps and prawns, land scorpions and spiders.







## *The Age of Fishes*

It was while the red sandstones of the Devonian Period were being laid down over the Silurian shales, that a startling creature of entirely new design appeared, and set the pattern for higher species yet to develop.

This was the Fish, first of the vertebrates, that is, the first creature with a spine. The fish had many other remarkable improvements, among them a brain and a two-chambered heart. Its vital organs were arranged safely and snugly inside a protecting bony skeleton, which in turn was encased in a streamlined skin, covered with a light armor of tough scales. Its big eyes were set in a hard skull, instead of sticking out on stalks, and it had a big mouth, lined with sharp teeth, for seizing food. This new creature was swift and graceful in its movements, and could easily dodge the big, clumsy sea scorpions.

The fishes multiplied rapidly and soon were masters of the water. Fish are believed to have first developed in fresh water streams, whence they swam out to sea. This may account for the habit of deep sea fish returning to fresh water to spawn.







## *Marine Plants Invade the Land*

During the Age of Fishes, while life was developing in the water, and the land still lay barren and lifeless, many kinds of water plants were going through a strange transformation, evolving apparatus for breathing air.

Thus equipped, plants began to invade the land and take root on the muddy banks of warm lagoons. Dense jungles of queer-looking, thick-stemmed trees that never shed their leaves sprang up in the low, marshy tidewater regions, and spread across the land, following the courses of rivers and streams. Some of these new land plants were big tree-ferns; others resembled yucca and cactus.

As trees died and rotted, they toppled into the water and sank deep in the mire. In time a thick mass of decayed vegetation became fossilized to form the very coal that is now dug from the mines. For that reason the long time that these swamp forests flourished is called the Carboniferous Period.





The invasion of the low marshlands by water plants quickly changed the appearance of the coastal regions. The air was heavily charged with carbon and nitrogen, and a murky haze hung continually over the swampy jungles and the warm, shallow inlets, which teemed with life. As yet there were no birds or flowers.



As though following the lead of the plant life, many varieties of water bugs had developed queer arrangements for breathing air, such as tracheal tubes and book-lungs, and were crawling ashore in droves to take up a new life as the first land insects.

The first flying insect, the big dragon-fly, was taking to the air on gossamer wings. The lowly and pestiferous cockroach also became a flyer, but later returned to a life on the ground, though to this day it still has traces of its wings.





It was during the Carboniferous Period that life began to be released from the water. Up to that time creatures spent all their lives underwater, breathing through their gills oxygen dissolved in water, as fish do today.

Certain mudfish, however, had grown odd throat pouches, called swimming bladders, which, when filled with air from the surface, made the fish more buoyant in the water. In time these air pouches evolved into lungs. When underwater, lung-fish could breathe through their gills, like other fish, but in long periods of drought, when the streams dried up, they would burrow in the mud, and keep alive by breathing air through their swimming bladders.

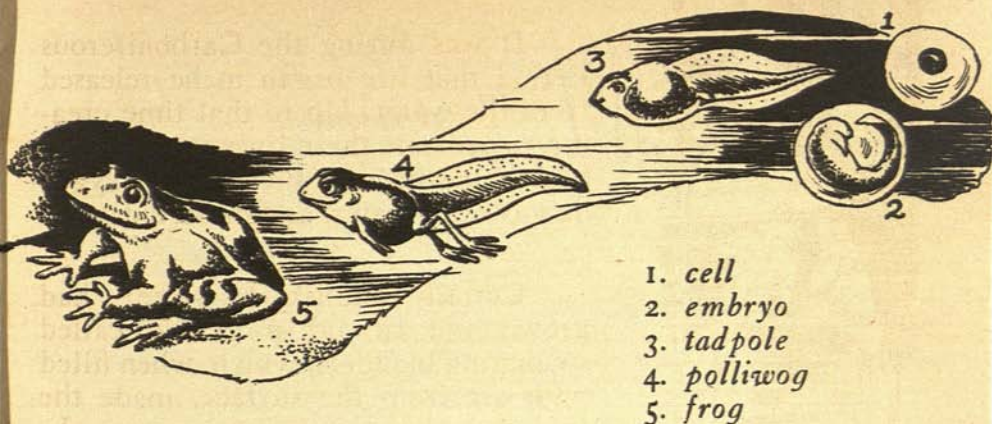
But that was not all. Nature had provided some lung-fish with strong flippers, instead of fins. These flippers were the beginning of legs. When their pool went dry, these fish could crawl down the streambed to another pool where water remained.

Before the Carboniferous Period had passed, there were many small creatures, frogs, newts and salamanders, that had both lungs and legs. They were the first amphibians, at home both in and out of the water.



*Newt*





## *A Lesson From The Frog*

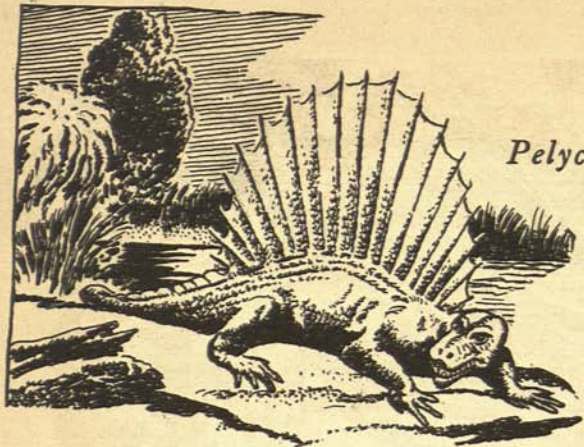
These changes might seem rather hard to believe, if we could not observe precisely the same process of evolution taking place before our very eyes in every country pond, and in a single season.

The common frog goes through this entire change before it becomes an adult, exchanging finny tail for legs, and gills for lungs; surely a convincing demonstration of the manner in which Palaeozoic amphibians came to be liberated from a life in the water so long ago.

The frog must go back to the pond to lay its eggs, yet if it stays under water beyond a certain time, it will drown.

### *Salamander*





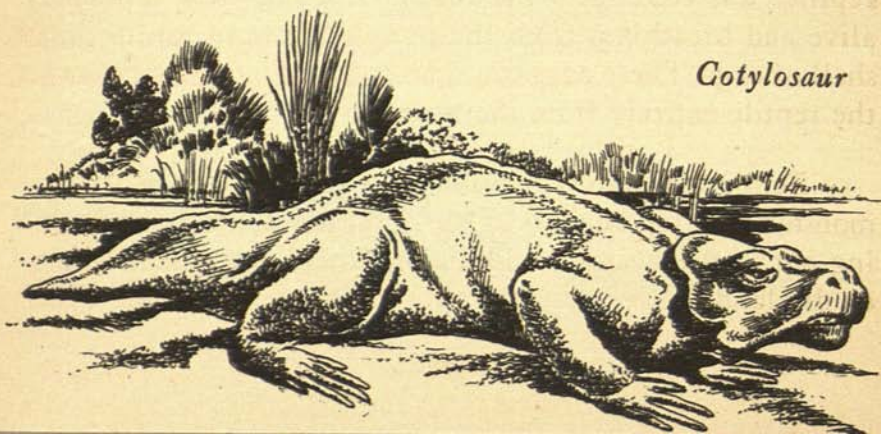
*Pelycosaur*

During the Permian Period, which followed the Carboniferous, the long seasons of drought contin-

ued. The rank swamp forests dwindled away, but in their stead grew plants and trees better adapted to a life on land.

In this period the amphibians increased enormously in size and numbers. Some of the little eight-inch newts and salamanders had developed into big, sluggish, repulsive-looking lizards, eight feet long, that hissed at each other on the muddy banks of the marshes.

These big, ugly fellows lived on fish and smaller amphibians, and fought among themselves. The Pelycosaur grew a spreading peacock's fan of bone to protect its spine from the dagger-like teeth of its enemies, but it looked more like it was trying to evolve into a Chinese junk.



*Cotylosaur*





The life of the Permian Period was a warning of things to come. The lizards grew ever larger and more ferocious in appearance.

The long droughts forced the amphibians to spend so much time on land, that many species grew to be true land animals. There were other factors that helped bring about this important change.

The marshlands, always teeming with life, were now overcrowded with myriad forms of living things. The new, succulent plants ashore offered an attractive and abundant source of food. A new and improved type of creature, the reptile, was coming to the fore. Its young were hatched, alive and breathing, from the porous but hard, protecting shell of eggs. These eggs could be laid on land, thus freeing the reptile entirely from the water.

Before the Permian period was over, dreadful reptilian monsters, the forerunners of the great dinosaurs, were wading out of the swamps, and making their permanent home on dry land.



*Megalosaurus*

## *The Age of Reptiles*

Now dawned what is perhaps the most startling period in earth's history; the Triassic, which ushered in the one hundred and twenty million year epoch of the Mesozoic Era (Middle Era of Life), better known as the Age of Reptiles.

Mother Nature, who for so long had been experimenting with living forms, must have gasped at her handiwork. The earth, the seas, and even the air, were swarming with the most nightmarish menagerie ever seen. The day of the dinosaur, which is Greek for "terrible lizard," had come. These Mesozoic monstrosities ranged in size from grotesque midget dinosaurs, two feet long, to stupendous giants eighty-five to ninety feet in length.



*Procerotops*





The appearance of these ugly reptiles was as varied as it was frightful. Most of them were four-footed, but some species walked or hopped upright like kangaroos on long, bird-like hindlegs, supporting themselves on thick, muscular tails.

Some, with enormous bellies, and weighing thirty or forty tons, waddled around on all fours. Some had the beaks of parrots or snapping turtles, or the bills of ducks. Others had heads like snakes or crocodiles, with great jaws lined with teeth sharp as knives. There were sea serpents far more terrible than any monster of the imagination, and big winged lizards like legendary dragons went skimming and soaring through the air.

All of these strange creatures had certain characteristics in common. They were all reptiles, cold-blooded, with three-chambered hearts, lacking the fourth that mammals have, which warms the blood. They had neither fur nor feathers, but scaly hides with horny bumps, and all were hatched from eggs.

*Duck-billed  
Trachodon*





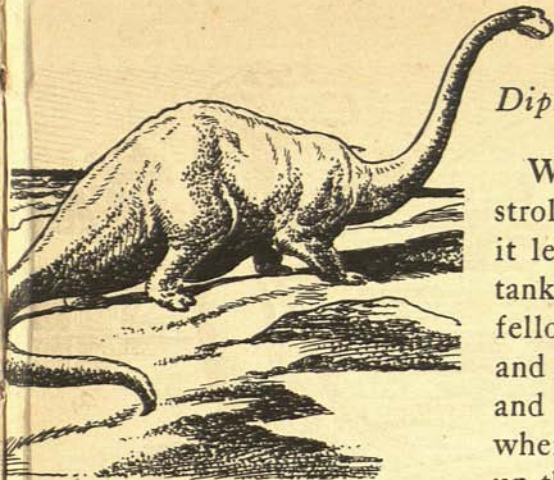
### *Bouncing Behemoths*

Most of the great dinosaurs were herbivores, plant-eaters. The rest, and these the most dreaded, were carnivores, flesh-eaters. They devoured the vegetarians.

Largest of the dinosaurs was the Brontosaurus, a colossal, ponderous reptile that stretched ninety feet from its flat alligator head to the tip of its powerful tail. Scarcely smaller, but with thinner neck and tail, was the ungainly Diplodocus. When he craned his neck, he could have peered over the rooftop of a suburban cottage.

These bouncing behemoths were forty-tonners. Fortunately, they were vegetarians, and each consumed about seven hundred pounds of plants and leaves a day.





### *Diplodocus*

When one of these titans strolled through the bushes, it left a trail like a military tank or a bulldozer. Such big fellows were very unwieldy, and they preferred to wade and wallow in the lagoons, where the water helped hold up their enormous bulk.

Here they spent most of their time dozing blissfully or grazing on the lush foliage on the banks like contented cows. For all their size, the big brutes were inoffensive and perhaps even docile. They were only dangerous, as a locomotive is, if one got in their way. They were sluggish and very dull-witted, having brains that were only the size of a chicken egg.

Their clumsiness often brought them to grief. Sometimes they rolled over in the deep mud of river bottoms and couldn't get up, which was lucky for later fossil hunters.



### *Brontosaurus*

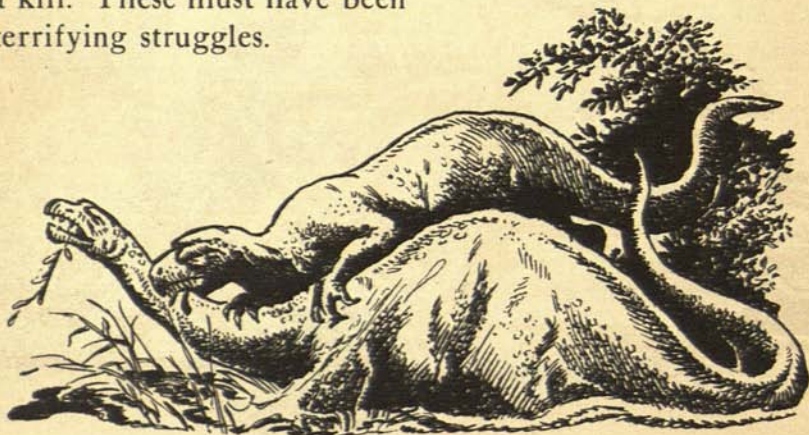




## *Killer-Dinosaurs*

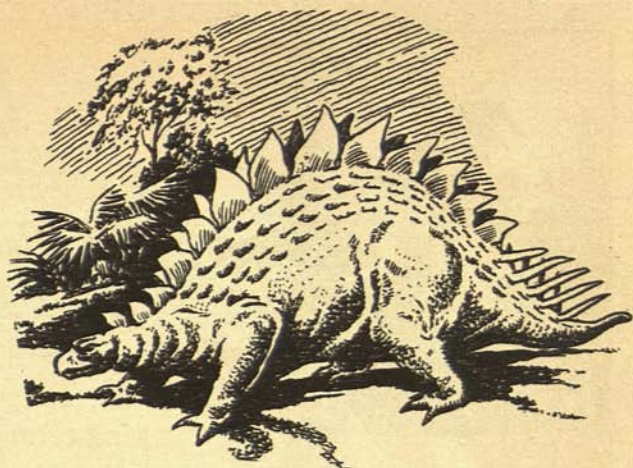
Largest and most frightful of the dreaded flesh-eaters was *Tyrannosaurus Rex*, or king-tyrant lizard, a cruel killer who towered twenty-five feet in the air. Concealed by the thickets on the banks, the king-tyrant stalked the unwary *Brontosaurus* or *Diplodocus* browsing sleepily

in the lagoon. Watching for his chance the killer-dinosaur sprang down upon his startled prey. It was over very quickly if the tyrant's terrible five-inch teeth reached his victim's vulnerable throat or neck. If the *Brontosaurus* survived the first attack, its only hope was to drag its mighty foe out into deep water and hold him beneath the surface with its own great weight. This probably didn't succeed very often. Sometimes two king-tyrants would battle to the death over a kill. These must have been terrifying struggles.





*Stegosaurus*

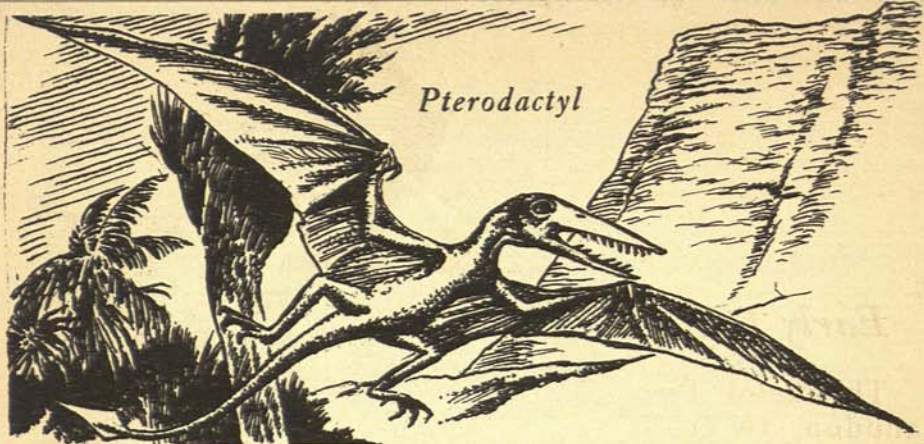


### *Armored Vegetarians*

Other dangerous meat-eaters were Megalosaurus and Allosaurus. Some of the peaceful vegetarians, more fortunate than the rest, were protected by a shield of pointed, bony spinal plates, as in the case of Stegosaurus, or the terrible horns and spiked collars of Triceratops, Styracosaurus and Monoclonius. Sometimes these bristling super hedgehogs, when fighting for their lives, were more than a match for the over-confident flesh-eaters.







*Pterodactyl*

### *Flying Lizards and Swimming Birds*

During the Mesozoic Age reptilian creatures joined the winged insects in taking to the air. Strange to say, it was not a bird that first flew, but a sinister-looking, four-legged lizard called the Pterodactyl. It had a scaly hide instead of feathers, and its wings were flaps of skin that stretched from its shoulders to its taloned forefeet, and thence down to its knees. A long fifth claw supported the tip of the wing. It had a pointed devil's tail such as you see in pictures of Mephistopheles, and a wingspread of six to twelve feet. The Pterodactyl may have been very clumsy in flight, but it could climb trees like a woodpecker.

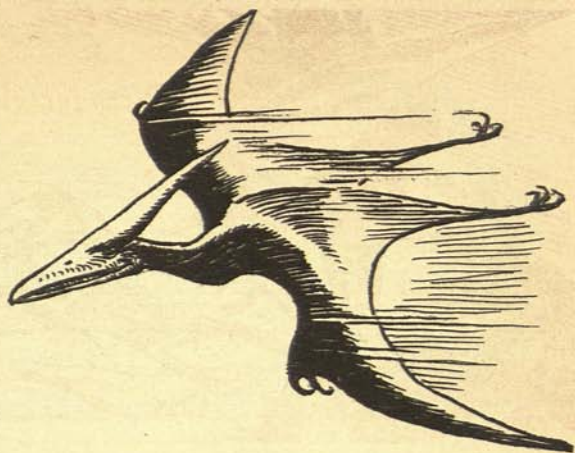
There were "birds" in those days, but as yet they had no wings; flightless water fowl that spent most of their time swimming and diving for minnows. This water bird was called Hesperornis.



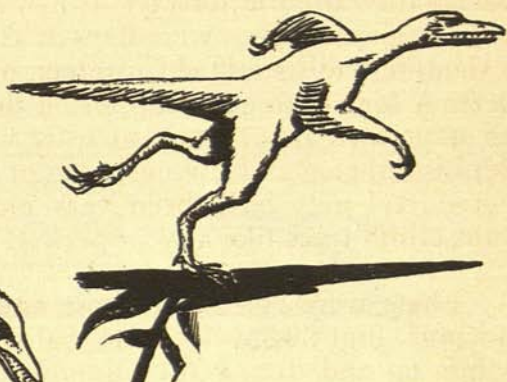


## *Early Birds*

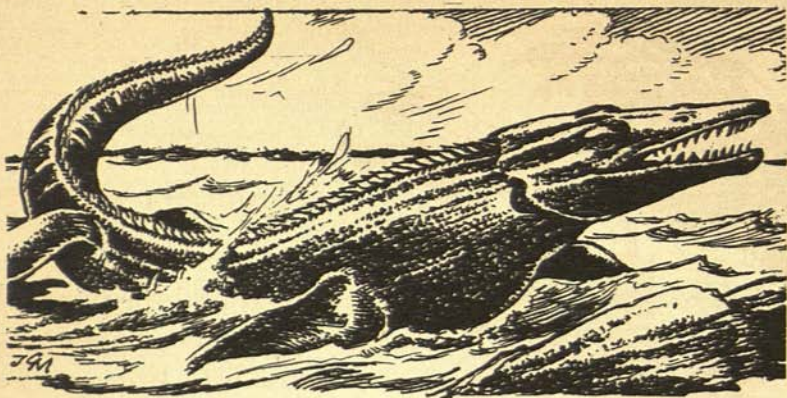
The weird Pteranodon, twice as large as the Pterodactyl, and trim as a modern fighter plane, was the last of the great flying lizards. These freakish flyers were not the ancestors of birds of today.



Feathered birds are believed to have descended from a grounded forefather, the Proavis, a strange running, hopping reptile that grew feathers but never mastered the art of flying.



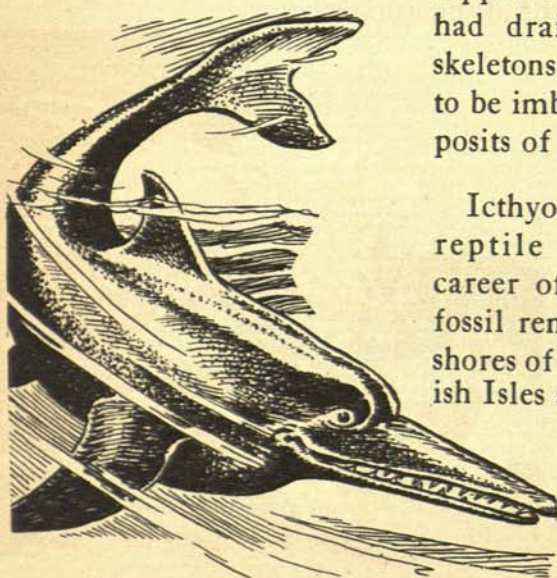
Archaeopteryx (Ancient Wing), though a reptile, was the first true bird. It had claws on its wings, a long tail and sharp teeth, which modern birds lack.



## *Mesozoic Sea Serpents*

As startling as the big land dinosaurs were the monstrous swimming lizards, which, failing to make a success as either amphibians or land animals, had returned to their original home, the water.

The shallow sea that rolled over the broad plains of Kansas in Cretaceous times was ruled by the Mosasaurus, a huge air-breathing reptile that had exchanged its legs for flippers. After this inland sea had drained off, hundreds of skeletons of Mosasaurs were left to be imbedded in the chalk deposits of Kansas.



Ichthyosaurus was another big reptile that had chosen the career of a deep sea fish. Its fossil remains are found on the shores of the Americas, the British Isles and Australia.





*Megalosaurus*

Happily for puny Man, these horrific monsters had vanished from the scene long before he first appeared upon the earth. What man would not have

cringed at the sight of the terrible teeth and clutching talons of a towering, flesh-eating Megalosaurus, or would not have shrunk with fright before the charge of an enraged horned dinosaur, twice the size of a presentday rhinoceros?

Why, then, did not these gigantic reptiles survive and remain forever lords of all creation?

*Styracosaurus*



## *A Changing World*

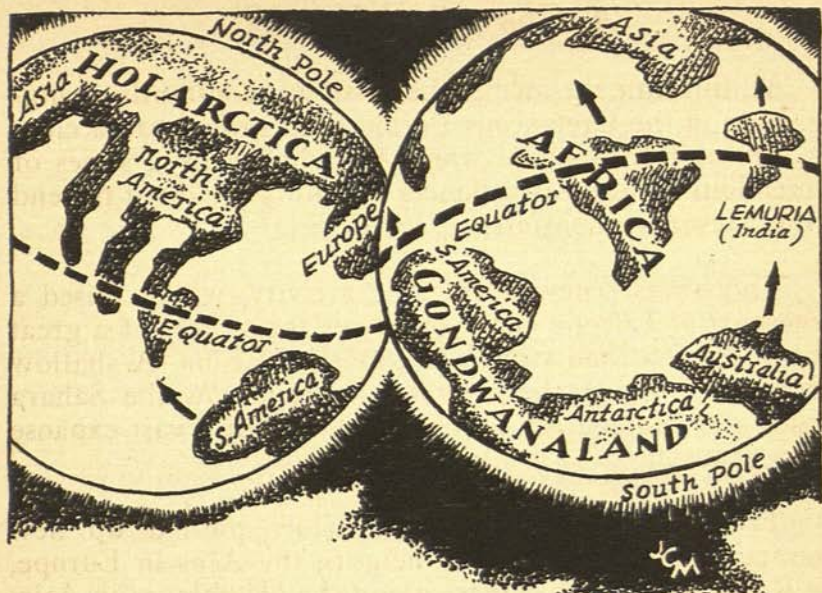
All this time the face of the earth was constantly changing. Late in the Cretaceous Period, that brought to a close the Age of Reptiles, the world was shaken by a series of tremendous natural disturbances that brought about the end of the Mesozoic monsters.

There was renewed volcanic activity, which raised a large part of Europe and Asia above the waters of a great central sea that had stretched almost to China. A shallow ocean that formerly had covered what is now the Sahara Desert was drained off, leaving nothing but a vast expanse of dry sand.

Tremendous pressure from below pushed up new mountain ranges to towering heights, the Alps in Europe, the Rockies in North America and the Himalayas in Asia. At the same time older mountains, like the Appalachians, were being worn down by the action of wind and rain, of ice and melting snow. Earthquakes and landslides in the depths of the sea caused lands to sink beneath the waves in other quarters.







## *Continents Adrift*

Could a map have been made of the earth in Mesozoic times, it would have borne no resemblance to the world of today. Vast land masses were adrift, shifting slowly toward their present positions, as the Earth's spinning motion redistributed the weight on the surface.

One huge body of land called Holarctica, destined to split up into the continents of Asia, North America and Europe, was moving northward from the tropical zones bordering the Equator. Most of the big dinosaurs roamed over Holarctica.

South of the Equator, what are now South America, Antarctica and Australia were linked together in another large land mass, Gondwanaland, which had its own distinctive forms of animal life. Africa and India drifted separately as large islands.

The great reptiles of the Mesozoic Era were made for a life in a hot, damp climate amid abundant vegetation. When the land mass of Holarctica slowly drifted into more northerly zones, where cold winds swept down from the mountains, the rank tropical foliage withered and died. With the cutting off of their food supply, the doom of the dinosaurs was sealed.

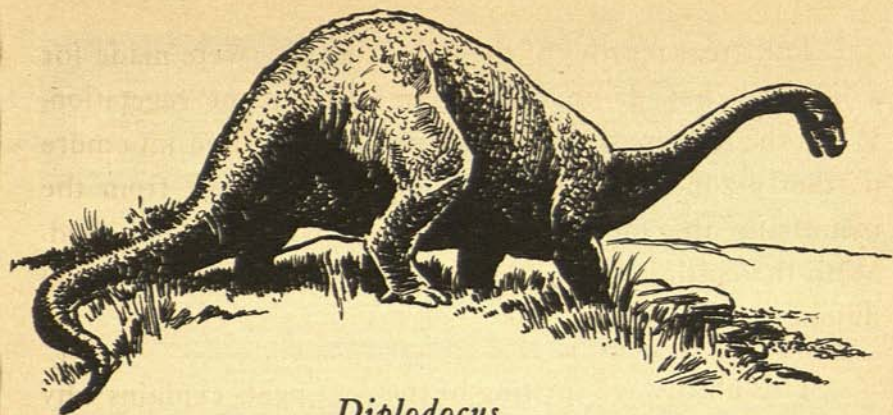
This northward shifting of the continents explains why the fossil remains of animals that could only have lived in the tropics are now found in regions as far north as Wyoming and Montana. It also accounts for the finding of fossil magnolias in Greenland!

The monstrous reptiles had had their day, a "day" one hundred and twenty million years long. They flourished as

long as conditions were just right for them. Extinction overtook them when they were unable to adjust themselves to changing conditions in a changing world.







*Diplodocus*

The dinosaurs had grown too big for nature to support any longer. They were unable to develop into a higher, more intelligent species and, had they survived, would only have continued to grow larger and larger, with ever-increasing food problems. They had reached a dead-end on a detour from the main highway of evolution and progress, from which there was no turning back. Nature's solution to the problem was to let them perish. It is odd that the only living direct relative of the mighty dinosaurs is the Sphenodon, a timid, furtive little reptile, two feet long, that lives under rocks.





*Theriodont*

## *The First Mammal*

If all the great reptiles died out, how was life continued on earth? The answer is, by other species. As far back as the Triassic Period certain small insignificant reptiles, the Theriodonts, who had a much higher degree of intelligence than the big dinosaurs, began to evolve some of the characteristics of mammals.

Sprung from these half-reptilian ancestors, there appeared in late Triassic times the first true mammal, the *Microlestes*, a small, marsupial type of animal (one which, like the kangaroo, carries its young in a pouch) that looked very much like the modern duck-billed platypus of Australia. This tiny creature was a tremendous advance over the great dinosaurs that ruled the earth but, while they flourished, was too small to compete with them.

This first mammal had developed a remarkable heart, with a fourth chamber that warmed the blood. It had soft, warm fur, instead of a scaly reptilian hide and, most important, it had evolved the amazing faculty of bringing forth its young alive, and later nourishing them from its own body.



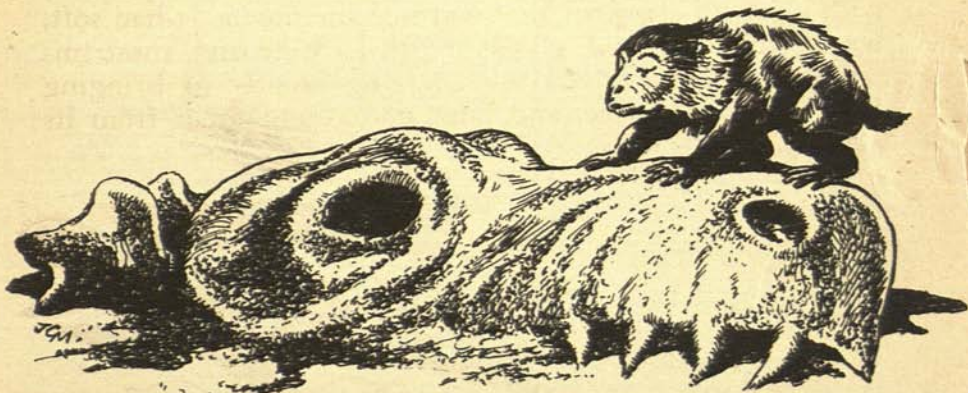
*Microlestes*





These lively little mammals were small enough and smart enough to keep out of the sight and reach of the big fellows. Besides, the change in the climate didn't bother them a bit. Their warm blood and fur enabled them to easily adapt themselves to the increased chill in the air, and there was still plenty of food left for small animals, who could live nicely on very little.

So, while the giant reptiles were dying out, the cunning little mammals were multiplying and improving their species. By the close of the Mesozoic Era a new and improved mammal had appeared on the scene, a creature that resembled a lemur and was called Microchaerus. The Microchaerus was the first primate, and therefore one of the remote ancestors of man. When the dinosaurs finally became extinct, the little mammals had the world all to themselves.



# *Geological History of the Earth*

Geological Ages ... applying to rocks	Eras ... applying to types of life	Periods ... named for rock strata	Kinds of Life	Estimated Duration
Archaeozoic	Azoic	Archaean	No life	900 million years
Primary	Proterozoic	Pre-Cambrian	Algae, scum	300 million years
	Early Palaeozoic ("Ancient Life")	Cambrian	Jellyfish	150 million years
		Ordovician	Shellfish	
		Silurian	Trilobites	
	Later Palaeozoic	Devonian	Fishes	
		Carboniferous	Swamp Forests	
		Permian	Amphibians	
Secondary	Mesozoic ("Era of Middle Life")	Triassic	First Dinosaurs	120 million years
		Jurassic	Age of Reptiles	
		Cretaceous	Last of Dinosaurs	
Tertiary	Cainozoic ("Era of Recent Life")	Eocene	Age of Mammals	20 or 30 million years
		Oligocene	1st Glacial Wave	
		Miocene		
		Pliocene	Sub-Men	500,000 B.C.
		Pleistocene	Neanderthal Men in Europe	300,000 B.C.
			Cro-Magnon Men (homo-sapiens) in Europe	Last Glacial Wave
				100,000 B.C.
				12,000 B.C.
Quaternary		Holocene ("most recent")	"Modern" Men	Historic Era begins 4,000 B.C.





## *The Cainozoic Age*

About twenty-five million years ago the same changes of climate that brought about extinction to the great dinosaurs and an end to the Age of Reptiles caused the earth to take on an appearance much like that of the world of today. With this transformation we come to a new geological epoch, the Cainozoic Age, or Era of Recent Life.

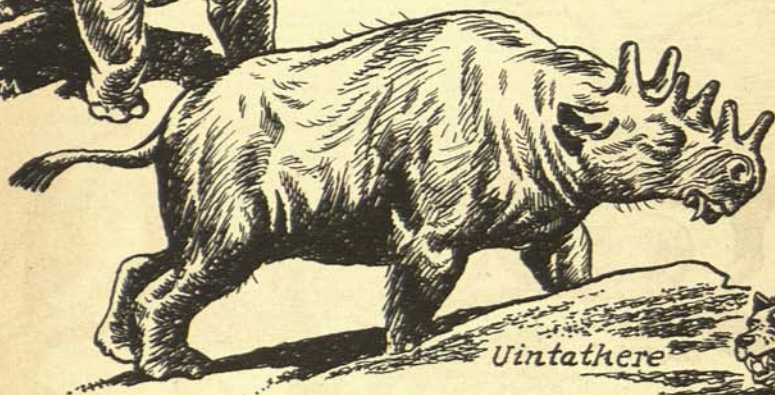
"Recent" may seem an odd word to apply to a period that began twenty-five million years ago, but when compared with the two billion years we have been reviewing, it is not very far in the past, after all. The Cainozoic Era, which is more often called the Age of Mammals, is divided into five periods; Eocene ("Dawn of Recent Times"), Oligocene, Miocene, Pliocene and Pleistocene, to which a sixth is being added, the Holocene ("Most Recent"), or Neocene ("New Times"), which covers the Historic Era up to the present day.

The climate, though moderate, was much cooler than it had been in Mesozoic times. Great land forests were spreading over the world, interspersed with broad grasslands that offered abundant grazing grounds to droves of plant-eating animals.





*Titanotherium*



*Uintatherium*



*Hyaenodon*

gent ones began developing into the animals of today.

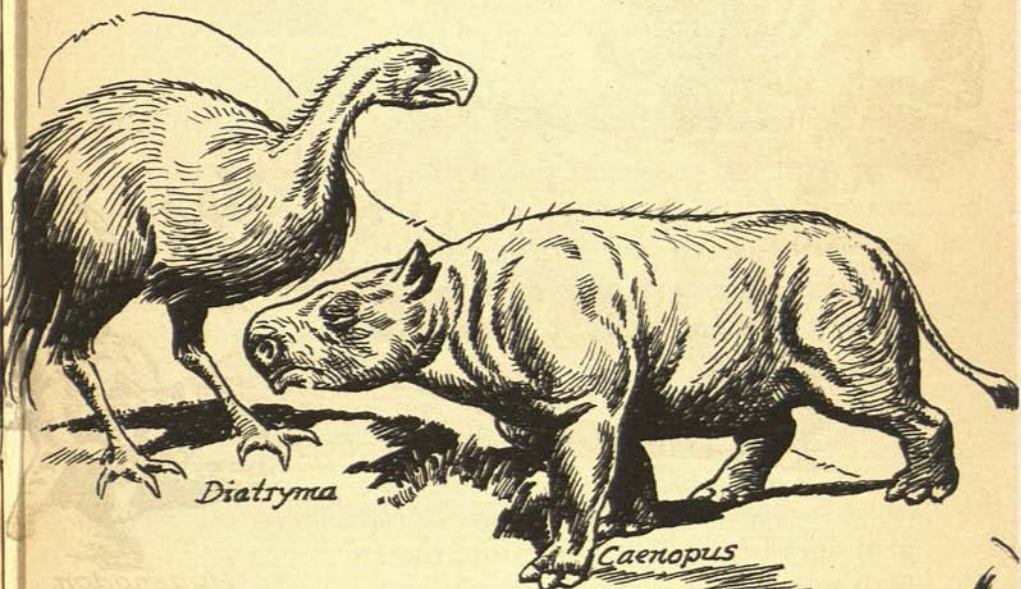
A few developed into great, lumbering brutes, like *Titanotherium* and *Uintatherium*, and for awhile it looked as though Mother Nature would repeat the mistake she had made with the dinosaurs.

But before very long, they too reached dead-end, and became extinct. The *Hyaenodon* was the Eocene ancestor of later hyenas and wild dogs.



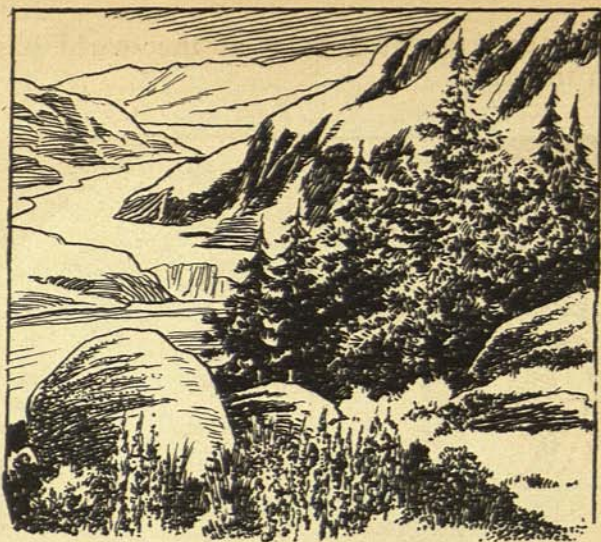
There were still plenty of strange-looking, ferocious creatures. There was a great, meat-eating, flightless bird, seven feet tall, the *Diatryma*, that looked somewhat like an ostrich. It trotted over the American plains, seeking what it might devour.

The *Caenopus*, a stream-lined descendant of *Uinta*-there, later retreated into East Africa, and became the ancestor of the present rhinoceros.



*Eohippus*, the Dawn Horse, was the forerunner of modern horses, but it had toes like a rabbit, instead of hoofs, was spotted like a reindeer, and was only the size of an ordinary house-cat.





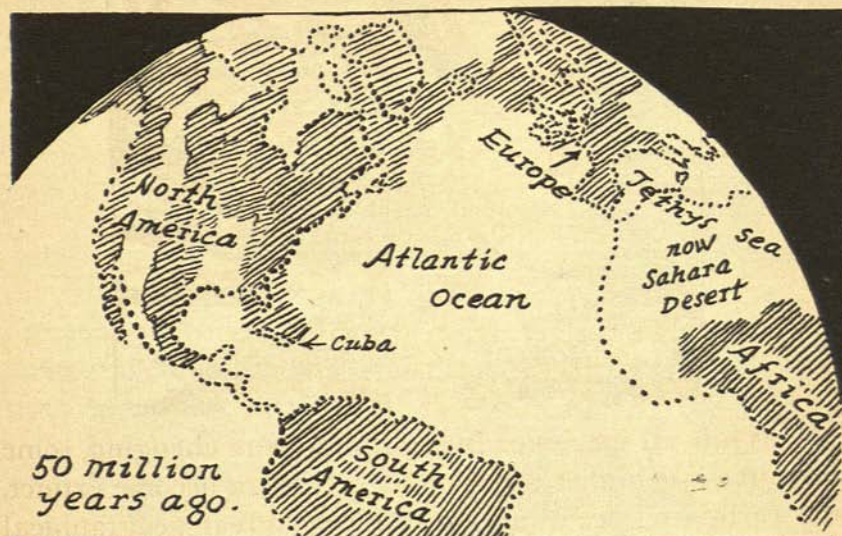
While all species of living things were changing, some to evolve into higher forms of life, others to become extinct, the earth itself continued to undergo great geographical changes. Some of these were sudden and violent; others were so slow and gradual through the ages as to be hardly felt or noticed. The former were caused by volcanic action or tremendous internal pressure, earthquakes, floods, tidal waves or landslides on the ocean floor. The latter were the result of erosion by wind and rain, the gradual sinking or building up of the land, and much later, glacial action.

A glance at the maps on the next page will show you how the appearance of parts of the world has changed over millions of years. Once North America looked more like a group of large islands. The delta of the Mississippi River once stood at Cairo, Illinois. In those days you could have travelled overland from America to England.

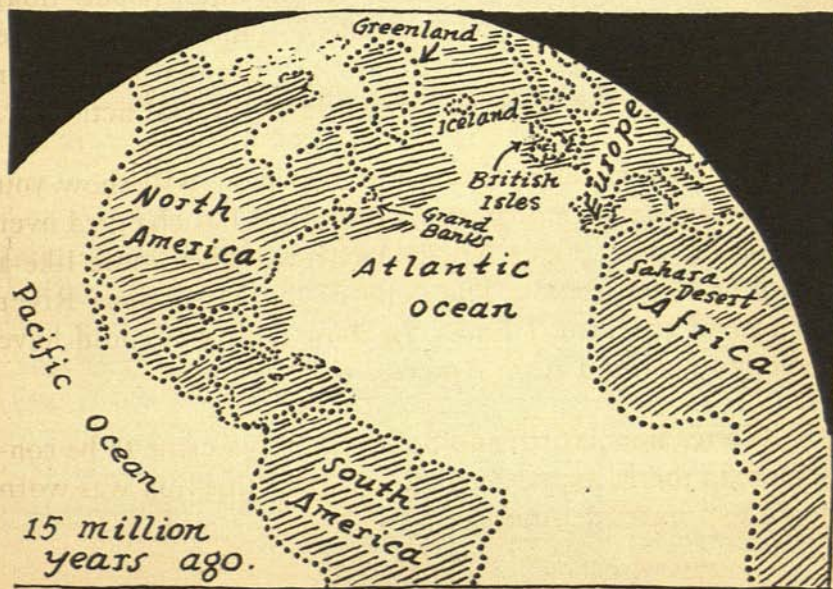
Notice how North and South America came to be connected, in the Miocene Period, and later this link was worn down to a narrow isthmus.

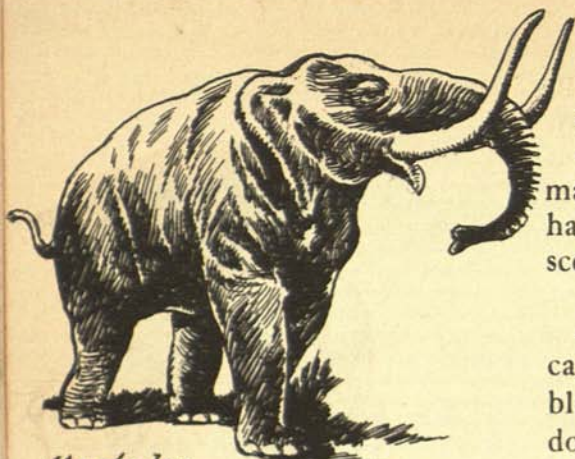


How the appearance of parts of the world has changed through the ages.



Rising lands and draining seas wrought these changes. The dotted lines indicate the present shape of continents.





*Mastodon*

By the time the Pliocene Period had succeeded the Miocene, many new kinds of animals had appeared upon the scene.



*Entelodont*

At that time the American western plains were black with herds of Mastodons, prehistoric elephants of great size. In Europe and Asia the Entelodont roamed the forests, feeding on roots and acorns. This was a giant wild hog, the ancestor of domestic swine.



*Ground sloth  
and  
Glyptodon*

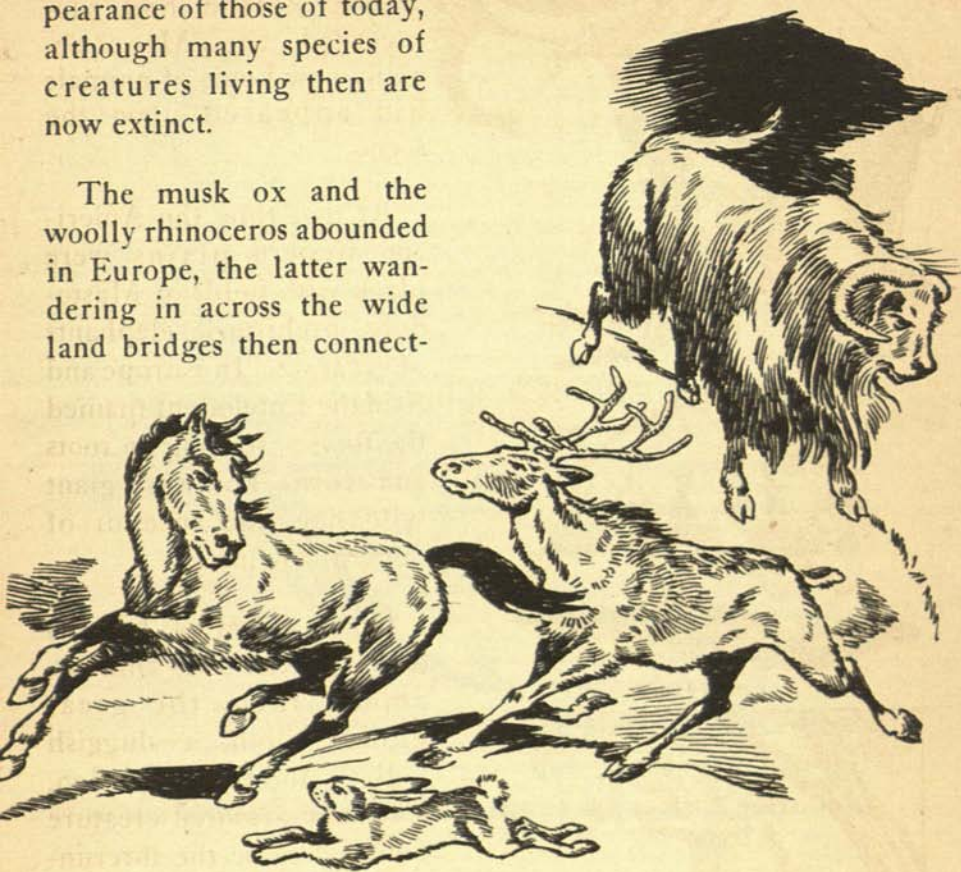
South America had its own distinctive animals, among them the great ground Sloth, a sluggish goliath, and the Glyptodon, a strange armored creature believed to be the forerunner of the armadillo. Skeletons of the sloth have also been found in ancient tar pits in southern California.

In the Pleistocene, the geological period immediately preceding the present one, the animals had



assumed the general appearance of those of today, although many species of creatures living then are now extinct.

The musk ox and the woolly rhinoceros abounded in Europe, the latter wandering in across the wide land bridges then connect-



ing that continent with Africa. The woolly rhinoceros was finally exterminated by early men, and the musk ox retreated into Arctic regions, where it still survives.

There were lots of reindeer and wild horses. The latter were shaggy little beasts that by this time had grown hoofs in place of their former toes. They were about the size of the present Shetland pony.

## THE COMING OF MAN

It is in the rocks of the Pliocene Period, dating back at least five hundred thousand years, that the first fossil bones resembling those of man have been found.

Man did not suddenly appear full-fledged upon the earth, like some fabulous visitor from another planet, but, like all other creatures, had been gradually evolving for thousands of years from some lower form of Life.

True men are believed to have lived on earth three hundred thousand years, but they were preceded for ages by sub-human beings that for want of a better name are called ape-men. Nothing was known definitely of these prehistoric prototypes of men until a half-century ago. The search for further evidence of them goes on constantly. New and important discoveries from China have been revealed since the war.





## *Man Emerges from the Animal*

The resemblance of man and the great anthropoids, however slight, gave rise to the belief that in the long distant past both men and apes sprang from some common ancestor. Early in the Eocene Period there were small primates called Tarsioids that might have been this ancestor. The Tarsioids were the forerunners of monkeys and survived by climbing to safety in trees whenever dangerous animals came near.

But if man had a tree-dwelling ancestor, he has certainly inherited no skill in climbing, for that is the thing he does most clumsily and with greatest effort.

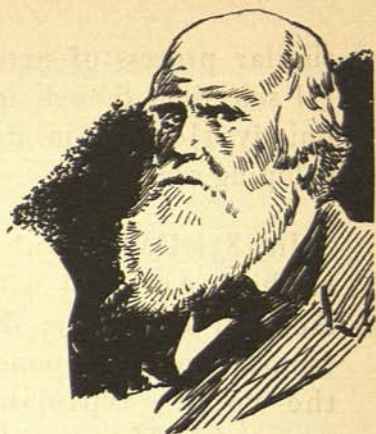
The Tarsioids walked on all fours and had tails. Somewhere between Tarsioid and man another descendant got in the habit of walking on its hindlegs, leaving its forelegs free for grasping. In time the forelegs and feet evolved into arms and hands. As for the tail, biologists tell us that man still has vestigial muscles at the base of the spine for wagging a tail, if he had one.

There were many other changes as man developed from the animal. His eyes grew larger, and he came to depend more upon sight than smell. Most animals seize food with the teeth, and hence have large mouths. After man's ancestor began to carry food to his mouth with his hands, his mouth grew smaller. Now it is difficult for man to grasp anything with his mouth, as you may know, if you have ever bobbed for apples in a tub of water at Hallowe'en.



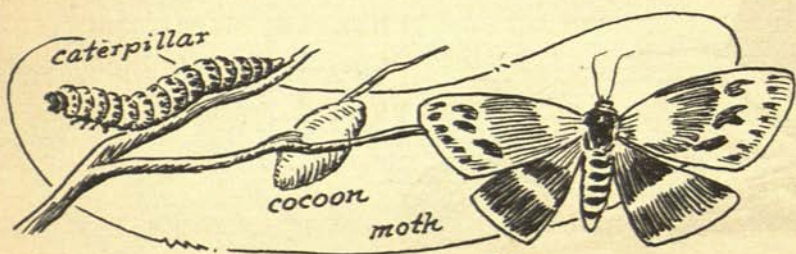
## *How a Book Changed the Thinking of the World*

Any reference to the origin of man brings to mind the name of Charles Darwin, famous English naturalist, and his great book, *On the Origin of Species* (1859), which changed the thinking of the world.



When Darwin was a young man, everyone believed first: that man had been specially created a perfect specimen, endowed with all his faculties and accomplishments, including speech, right from the start. Second: that forms of life do not change; that species of animals have always remained the same from the beginning.

Young Darwin, having become a botanist and a naturalist, began to observe many things. Everywhere he looked he saw change in nature. He saw the caterpillar turn into a beautiful moth, the tadpole transformed into a frog. But this was only the beginning. Darwin noted how, by a process of selection and cross-breeding, dog-breeders could produce either a mastiff or a terrier from the same stock. He began to wonder if nature herself might not have followed a



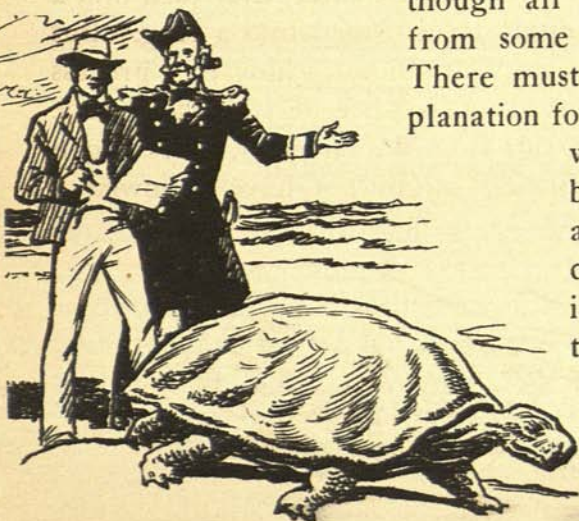


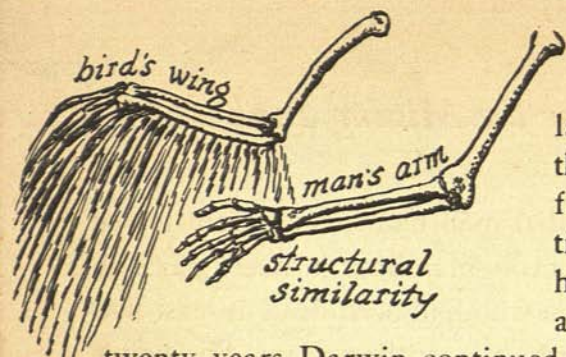
similar process of natural selection, though infinitely slower, in developing creatures.

In 1831 Darwin sailed as ship's naturalist with Admiral Fitzroy on the famous five-year 'round-the-world' exploring cruise of *H.M.S. Beagle*, and had the rare opportunity of studying at first hand a myriad variety of living things in many lands.



In South America he saw the similarities between fossils of the extinct, prehistoric glyptodon and the present armadillo. In the Galapagos Islands he observed how the creatures of one island, from giant turtles to tiny butterflies, differed from those on another island, and from those on the mainland of South America, though all must have descended from some common ancestor. There must be some simple explanation for this. The more Darwin observed, the more he became convinced that all living things had changed, slowly and imperceptibly through the ages.





After his return to England, Darwin confided his theory to only a few of his friends and fellow-scientists, who agreed that he had hit upon a revolutionary idea. For the next

twenty years Darwin continued his studies and investigations, piling up a mountain of evidence to prove his theory. He made endless comparisons that led him to believe that all creatures are related to each other through remote common ancestors.

For example, a man's arm, a dog's leg and a bird's wing are utterly unlike in external appearance, yet a study of their bone structure reveals startling similarities, as though nature in their construction had followed a master design with certain variations.

In 1858 Darwin was just about to publish his theory of evolution when he received from A. R. Wallace, a fellow-scientist in the East Indies, a manuscript setting forth practically the same idea of natural selection. Darwin was in a quandary. Fairness to his colleague prompted him to withhold his own work of years. Other scientific friends solved the dilemma by having both papers read at the annual meeting of the Linnaean Society of London.

When Darwin's theory was published in his book, *On the Origin of Species*, its effect on popular thought was like the dropping of a bomb. It immediately stirred up a bitter debate that was to rage for years, but Darwin's theory was so fortified with common sense and indisputable facts that it opened the eyes of the world to marvelous processes of nature it had never dreamt of.



## *The Search for the Missing Link*

Darwin's suggestion that man had sprung from lower forms of life started a scientific man-hunt in many parts of the world, a hunt for a man who had been dead at least five hundred thousand, and perhaps a million years. The being they hoped to find was not entirely a man, nor an ape, but a sub-human creature that might possibly have been the common ancestor of both men and apes.

The public was tremendously interested in the project but, not having delved deeply into the subject, held some queer and very vague notions about it. There was much speculation as to the likelihood of finding such a "missing link," a term which fascinated the public. Imaginative little boys and timid ladies half expected to come face to face with a "Missing Link" on the street, and for many years afterward imitation "Missing Links" were a popular attraction of circus and carnival sideshows.



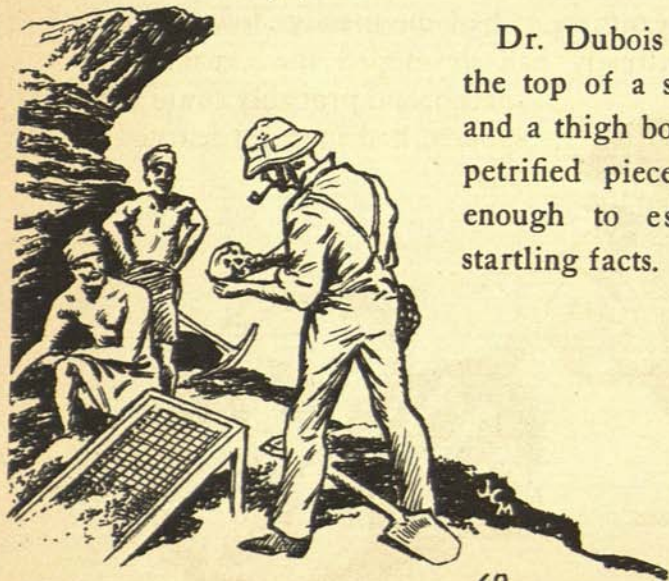
## Java Man

Years passed, Darwin died and was buried in Westminster Abbey among England's great, but no trace of a missing link was found.

Then, in 1891, the scientific world was thrilled by the news that the bones of an ape-man, five hundred thousand years old, had been unearthed in Pliocene rocks near Trinl, on the island of Java. This was the famous *Pithecanthropus Erectus*, or Walking Ape-man, as he was scientifically termed, but better known as Java Man.

After long and patient digging, Dr. Eugene Dubois, a surgeon in the Dutch Colonial Army in Java, had uncovered fossilized fragments of the long-sought skeleton of a man-like creature from the Pliocene Period.

Dr. Dubois had found only the top of a skull, three teeth and a thigh bone, yet these five petrified pieces of bone were enough to establish certain startling facts.





While the skull had the distinctively ape-like characteristics of the overhanging bony ridge above the eyes and the crest up the back of the skull, its brain cavity, though smaller than that of a modern man, was much larger than that of any known ape.

Perhaps most important, the thigh bone was straight, showing that the creature had stood erect in a position that no ape can assume. Further excavations near the same spot uncovered more bones, so that scientists, notably Dr. MacGregor, were able to make the life-like reconstructions of *Pithecanthropus*, so familiar to students.



*Pithecanthropus*  
after MacGregor

While *Pithecanthropus* had the massive lower jaw of the gorilla, he already had developed the capacity for speech, and probably could have spoken, had men yet learned to talk.



*Pithecanthropus.*



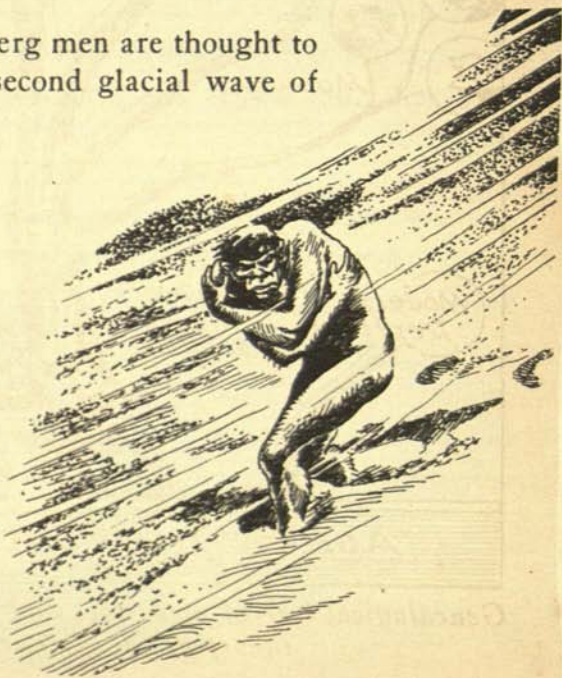
*Skull of  
Gorilla*



Heidelberg Man, so named because his remains were found near that German university city, is believed to have been the oldest of the sub-men that once inhabited Western Europe, and the ancestor of a later species of human, the famous Neanderthal Man.

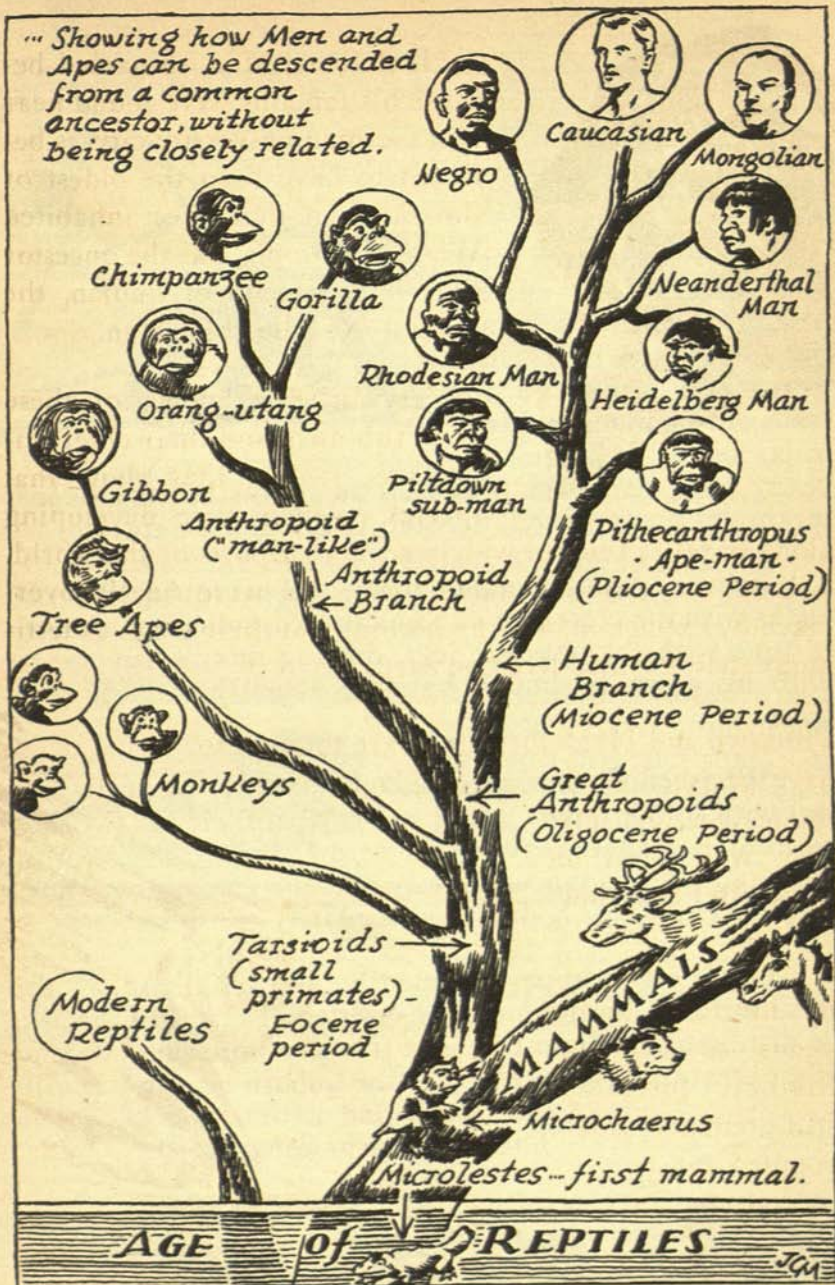
Very little is known of these early sub-men, and their chief importance is that they show that species of men were developing along parallel lines in widely separated parts of the world, without any contact among them. All were finally overtaken by extinction, leaving nothing but their bones as testimony that they had lived on earth.

Piltdown and Heidelberg men are thought to have perished in the second glacial wave of the ice age. At least they were seen no more after that time. Neither of them was a direct ancestor of modern Europeans, so our pre-historic forefather still remains unaccounted for.





"Showing how Men and Apes can be descended from a common ancestor, without being closely related."



Genealogical tree of men, apes and monkeys, based on the theory of Sir Arthur Keith



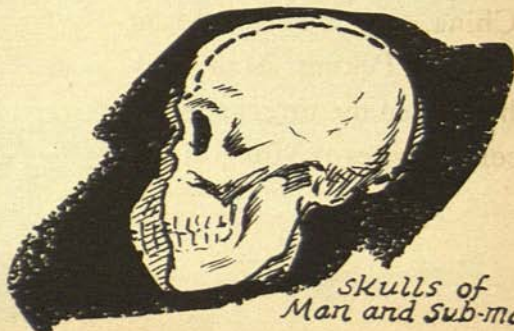
*Pithecanthropus  
and Gorilla*

Though this squat, hairy sub-man of Java might have been mistaken at first glance for an ape, there were other striking differences between him and the great anthropoids.

Pithecanthropus did not walk flatly, on the outside of the foot, like the ground apes, but balanced on heel and toe. His arms were shorter

and his legs longer than those of an ape. But there were also great differences between him and modern man.

As to the life of this shadowy, sub-human creature of so long ago, we can only surmise that it was as bestial as that of any animal that shared his world. Doubtless he waged a desperate, ceaseless hit-and-run struggle for existence against larger, stronger foes.



*Skulls of  
Man and Sub-man*

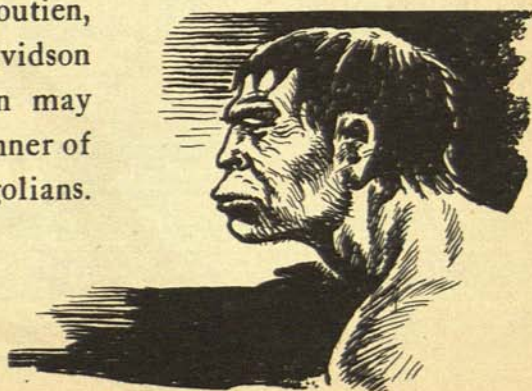


## *Other Sub-Men*

In various parts of the world palaeontologists pressed the search in the Pliocene and early Pleistocene strata of rocks for traces of other predecessors of man, from time to time making exciting finds.

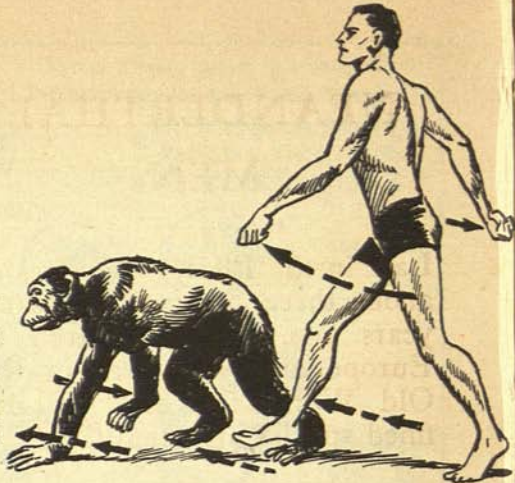
In 1911 the first petrified bones of *Eoanthropus*, the Dawn Man, more celebrated as Piltdown Man, were unearthed by Charles Dawson in Sussex, England. Near the skeleton was found a petrified club, which this prehistoric sub-man may have used.

As recently as 1929 the remains of the famed sub-human Peking Man were brought to light in the Western Hills, near Choukoutien, China, by Dr. Davidson Black. Peking Man may have been the forerunner of certain types of Mongolians.



## Traces of Man's Animal Ancestry

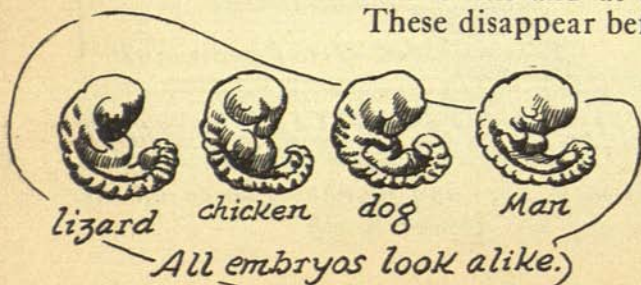
In the two hundred thousand years that followed the first appearance of sub-men, the forerunners of man gradually acquired the traits of true humans. Many traces of man's animal ancestry have remained with him as useless left-overs, only serving to prove his relationship with other creatures.



Some of man's ancestors walked on all fours. Man still walks with the cross-gait of a quadruped, swinging his arms in time with the opposite legs, making motions in the air with his arms, as though he were actually walking with them.

When man's animal ancestors suddenly came in contact with cold air, they raised and ruffled their fur to create an insulating space between the cold and their bodies. Man has no fur, but he subconsciously does the same thing. When cold air strikes his body, it involuntarily gets gooseflesh.

Other traces appear in man before he is born. In the third week of development the embryo of man can scarcely be distinguished from that of a lizard, a chicken, a dog, or other creatures. At twenty days the unborn human has gills like a fish and at four weeks, a tail. These disappear before birth.





## NEANDERTHAL MEN



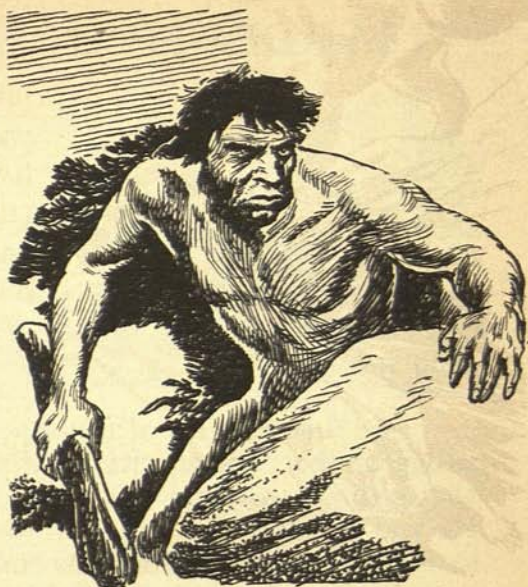
Late in the Pleistocene Period, about three hundred thousand years ago, there appeared in Europe and elsewhere in the Old World the first well-defined species of man.

The first remains of this newcomer were found in the valley of the Neander River, near Bonn, in Germany, in 1857. That's why he has been named Neanderthal man. He was a gnome-like little fellow, averaging only five feet, three inches in height, and his bent posture made him seem even smaller.

He had a large head, thrust forward on a thick neck, and his curved thigh bones indicate that he stood and walked in a slightly crouching position. His low, ridged brow and jutting jaws gave him a somewhat ape-like appearance, but he was definitely a man, and capable of making considerable progress.



These squatty, hairy little Neanderthal men, travelling in small family groups, wandered far and wide, for their remains have been discovered in France, Spain, Germany, Croatia and Czechoslovakia. A similar type has been unearthed in Palestine, and a negroid species in Rhodesia in South Africa.



As yet no traces of this kind of prehistoric man have been found in America, though a search has gone on for a century, so it is generally assumed that the new world was not inhabited by men until a much later date.

The belief that Neanderthal men roamed in small groups is based on the fact that never more than a few skeletons are found together in one place. These strange, gnome-like little folk were not the direct ancestors of modern men, but we are indebted to them for taking the first faltering steps on the long road toward civilization.



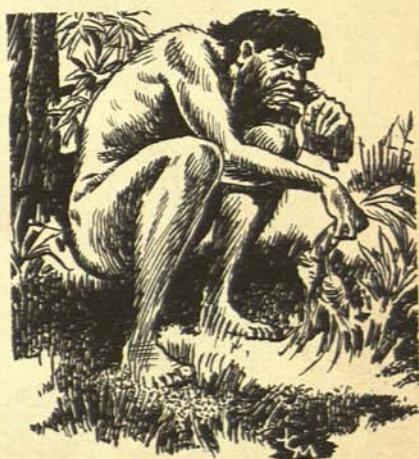


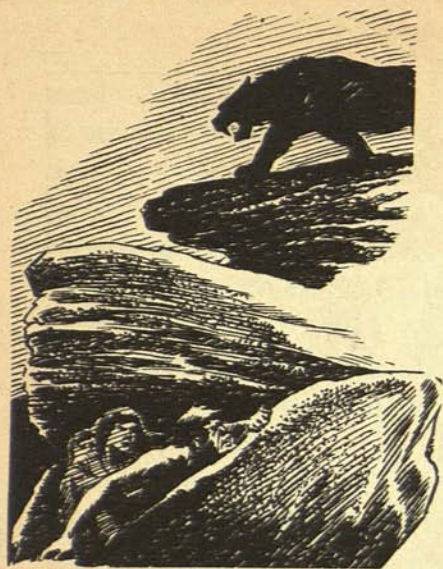


When we first become acquainted with man, he is just a naked little savage with no tools or weapons, living in a cold, hard, unfriendly world. He is still an animal among animals, but he is by no means king of the jungle. Instead, he is a timid, furtive creature, surrounded by more powerful wild beasts that sought to destroy and devour him. Naked, unarmed, except for sticks and stones, ignorant of the cheering warmth

and light of fire, he has to struggle constantly for a wretched existence under the open sky. His chief occupation is the search for something to eat. All day he forages about, looking for birds' eggs, berries, nuts, wild fruits, edible plants and roots, and anything else that might satisfy his gnawing hunger.

We can't say what Neanderthal man himself thought of life, but, since it was the only kind he had ever known, it was probably as sweet and wonderful to him as it has ever been to any man.





Early man had no home, not even a temporary, make-shift shelter. At close of day he and his mate and their little ones huddled among the rocks, or hid in a squatting place deep in the tall grass, or in the center of a protecting clump of thornbushes. They were frightened by snakes, and tormented by insects.

Often during the night their slumbers were disturbed by prowling wild animals crashing through the bushes close at hand or shattering the silence with blood-curdling cries.

Man lived in constant dread of the wild beasts that roamed the earth. Among them was the hairy mammoth, a towering prehistoric elephant, with enormous curved tusks and reddish-brown fur. Then there were the woolly rhinoceros and the great cave bear, both brutes of terrifying size and appearance.

Most dreaded of all was the sabre-tooth tiger, a giant bob-tailed, man-eating wildcat, somewhat resembling the modern lynx. It prowled at night, was extremely ferocious, and did not hesitate to attack animals many times its size.





*sabre-tooth  
tiger  
it was really  
a giant wildcat.*



*hairy mammoth.*



*the great  
cave  
bear.....*



*woolly  
rhinoceros.*

*J. Carroll  
HANSFIELD*

*Some Animals of the Pleistocene Period  
contemporary with Neanderthal Man*



We would like to think of these predecessors of ours as noble savages but, alas, nothing could be further from the truth. At this starting point in his slow rise man had lost the best instincts of the animal, and had not yet acquired the qualities of a human being.

He was filthy and vicious. He had no friends among his own kind, for in those primitive times the rule was "every man for himself." He was selfish and greedy, and would fight another man for a scrap of food. While he provided food for his mate and children, he doubtless satisfied his own appetite first, and let them have what was left.

Restraints were unknown to him, and he yet lacked the controlling influence of "conscience." He was a coward and a bully, and would not hesitate to steal, if he could get away with it. Perhaps he only fought bravely if he were cornered and desperate. In short, he was a very simple child of nature who did not know "right" from "wrong."



Hunger and fear were the driving motives in the life of primitive man. Many of his fears were real but others were imaginary and arose from his ignorance. The danger of being pounced upon and torn to pieces by a sabre-tooth tiger would have given anybody the jitters. But, besides such worries, man was needlessly "spooked" and frightened by anything he could not understand.

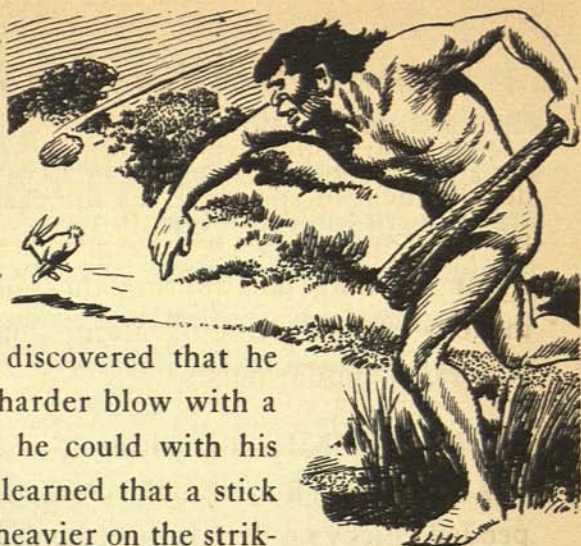
He had been blessed with a superior intelligence, which he had not yet begun to use, and an imagination he did not know how to control. He imagined everything was against him, even lifeless objects. He would go far out of his way to avoid passing what he thought was a sinister-looking tree, or he might throw stones at a "hostile" rock.

He was afraid of the howling wind, icy blasts, thunder and lightning. He came to think of them as angry gods, grim and terrible. On every hand he fancied he saw evil spirits at work.



## *Lessons from Life*

This early man had not yet invented anything, but he had learned many helpful lessons. He had discovered that he could strike a much harder blow with a stick or a stone than he could with his bare fist. In time he learned that a stick that was thicker and heavier on the striking end gave added force to the blow. From this idea came the first club.



He found, too, that if his aim were straight and true, he could throw a stone to bring down small game that otherwise could out-run and elude him. Many things he learned from the book of nature the hard way, by bitter experience. He knew already that his own puny strength was no match for the terrible fangs and claws of the larger and more powerful wild beasts, and he discreetly kept out of their way.



## *Man Learns to Talk*

A most noteworthy milestone at this time was man's development of speech. Even the earliest ape-men had the power of speech, but had not progressed far enough to use it for anything but uttering the sounds any beast might make — growls, cries of alarm, anger or pain, grunts, whines, or similar noises.

Neanderthal man, however, was really beginning to talk. Naturally, his vocabulary was very limited, and he depended chiefly on descriptive sounds, rather than words, to convey his meaning. His names for animals were probably imitations of the sounds animals made, just as a modern tot may say "bow-wow" for dog.

His simple utterances were undoubtedly accompanied by a great deal of gesturing, mimicry and pantomime. Crude as it was, it was the beginning of self-expression and the exchange of ideas among men.



## *A Garden of Eden*

Now began one of the most dramatic chapters in earth's history. Two hundred thousand years had passed since Neanderthal men had first appeared in Europe. These strange little people had survived a long time. They had learned many things and had raised themselves far above the animals, but they still roamed from place to place, they made nothing, they built nothing, they had no tools or weapons, and they still went about naked.

For a long time nature had been good to them; the climate had been kind, the winters extremely mild and the summers long and warm. Wild fruits and edible plants grew in abundance; in winter small game was plentiful, and living was easy for the Neanderthalers.

Had these favorable conditions become permanent the human race might conceivably have kept on leading an indolent, unproductive and unprogressive life.





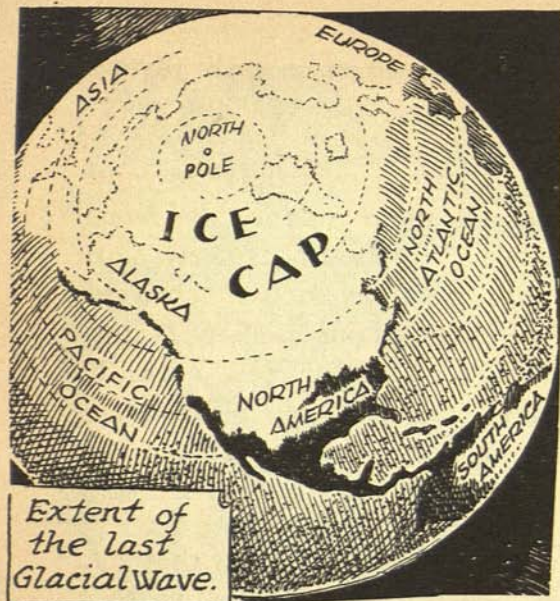
But something startling happened to change man's way of life, something that threatened all mankind with extinction.

The warm, almost tropical, climate changed. The long, delightful summers grew shorter and cooler, and year by year the winters grew longer and colder. "Eden" was no more.



Mighty glaciers came crawling down from the north like monstrous, twisting serpents, and an ever-thickening mantle of ice spread over the earth, killing vegetation, and driving men and animals far to the south in search of food. It snowed in regions where it had never snowed before.

The poor naked, shivering, bewildered Neanderthalers, fleeing before the icy blasts, did not know what was happening to their world, but a modern geologist could have told them that the earth was in the grip of the fourth and last glacial wave of the ice age.



## *The Ice Age*

The ice age, with its four glacial waves, was the last major geological disturbance that greatly changed the physical features of the earth. It was caused, some think, by

variations of the earth's orbit, which produced excessive cold.

This strange behavior of mother nature is estimated to have begun 500,000 years ago, and to have been in its final phases about 25,000 B.C. When it began the temperature kept falling, and thick ice caps spread outward from the poles, carrying Arctic and Antarctic cold into temperate regions.

As the great glaciers, rivers of moving ice, spread across the land, they picked up huge loose boulders, which became imbedded in the advancing wall of ice. This frozen mass stripped the earth of soil, gouged out deep valleys and, growing higher and thicker, scratched and rounded off the high slopes of mountains. Grinding glaciers cut through the ancient land bridges that had connected North America and Europe, and left Greenland and Iceland as islands.

Four times in half a million years, with long intervals of warm weather in between, the polar caps spread outward

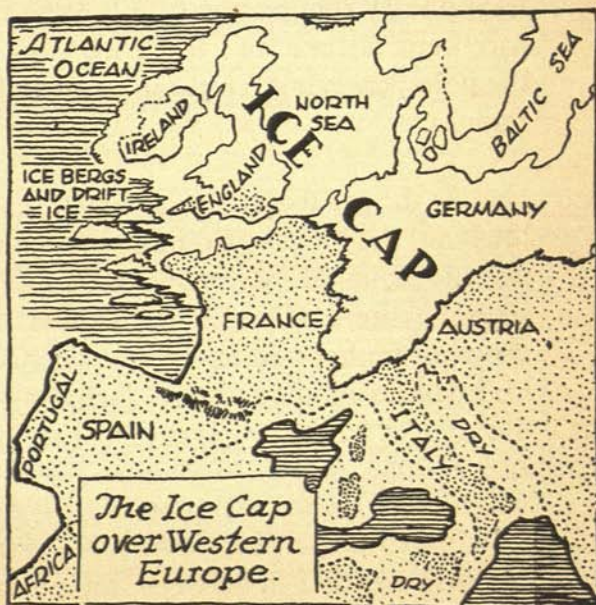


over nearly a third of the globe, and after each advance slowly melted and receded.

In Europe the glacial ice spread over half the continent, locking the British Isles to the mainland. In North America the ice sheet pushed as far south as New York City. As the freezing ice caps rose, they drew much water out of the seas. In the White Mountains of New Hampshire and the Adirondacks and Catskills of New York, the rocky summits of mountains, scratched or polished by glacial action, give convincing proof that the ice cap was several thousand feet thick.

As the glaciers melted, they left the regions they had covered littered with rock debris. With the return of a warmer climate, vegetation gradually returned to most of the scraped areas.

Forty thousand years ago, when the glaciers of the fourth and last glacial wave were retreating, groups of Neanderthal Men drifted back to their ancient haunts, but Western Europe was a changed place. Great forests had vanished, many species of animals had disappeared, and life for men had become precarious indeed.



## *Events of the Ice Age*

	Periods of the Glacial Epoch	Possible dates all prehistoric dates are speculative	Probable Order of Events On the eve of the Glacial Epoch a warm climate prevails in Europe
<i>Pliocene Period</i>	1st Glacial Wave (Günz)*	500,000 B.C.	Heidelberg sub-men in Europe. Climate grows cold. Glaciers spread over the continent. Most of the sub-men perish.
	1st Interval (Günz-Mindel)	400,000 B.C.	Ice caps melt and glaciers recede. Warm climate returns to Europe . . . Piltdown Man on the scene.
	2nd Glacial Wave (Mindel)*		Glaciers again cover Europe . . . Sub-men perish.
	2nd Interval (Mindel-Riss)	300,000 B.C.	A long interval of warm weather. The first Neanderthal Men appear.
	3rd Glacial Wave (Riss)*		Glacial conditions are repeated.
<i>Pleistocene Period</i>	3rd Interval (Riss-Würm)	200,000 B.C.	Period of warm climate. Primitive Neanderthal Men live a brutish life in Europe.
	4th and last Glacial Wave (Würm)*	100,000 B.C.	Ice cap again covers most of Europe. Neanderthal Men flee southward. British Isles ice-locked to the Continent.
	*Names of four Alpine Valleys where ancient glacial conditions have been studied and compared.	40,000 B.C.	After glaciers recede, Neanderthal Men return and begin to progress.
		25,000 B.C.	Ice cap recedes from northern United States.
		12,000 B.C.	Cro-Magnon Men appear in Europe . . . Neanderthals vanish.





## *Man Begins to Think*

It was the struggle for survival for these later Neanderthal men that set them on the way of progress.

Perhaps you have noticed that small hunted animals, such as mice, rabbits, squirrels and foxes, seem to have developed a saving, superior cunning, without which their breed would long ago have perished from the earth.

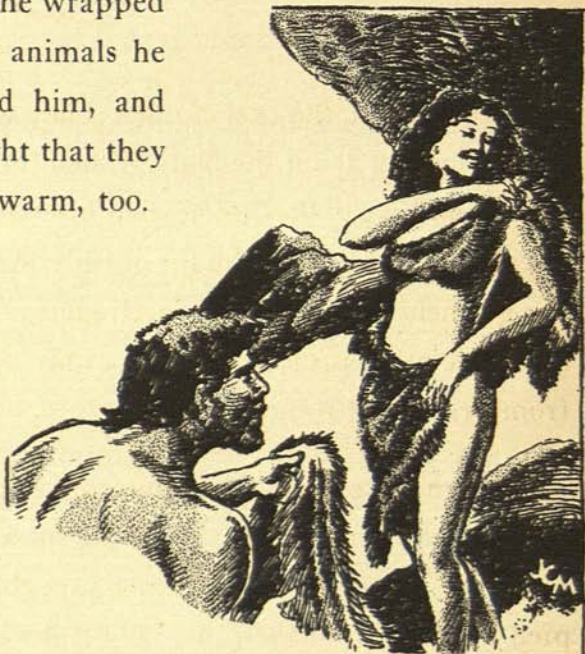
So it was with primitive man, when faced with utter catastrophe. For the first time he began to really think, to ponder and reason. More and more he came to use his God-given brain, which was to lift him far above the other creatures of the earth.

Man, they say, is the only animal that profits by experience. He had already had lots of experience, but had not known how to turn it to account. Now for the first time he began to take stock, to survey the grave situation he was facing, and to look for a way to overcome the difficulties ahead. The survival of the race was at stake.

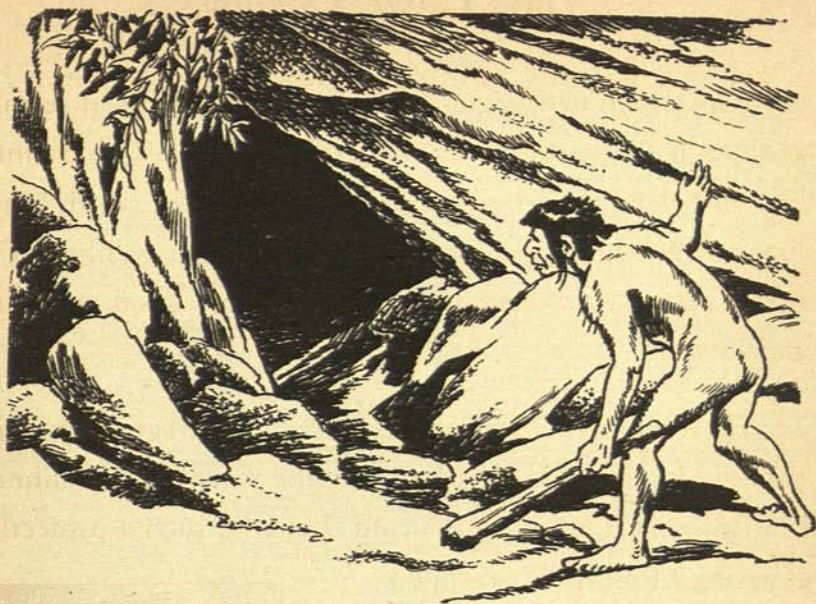
## *Three Great Necessities*

Once man had begun to really use his brain, it seemed as though the battle were already half won. The enemies he must conquer were hunger, cold and the wild beasts that were large and strong enough to destroy him. The three great, vital necessities of life were food, clothing and shelter.

To obtain the first he became a more aggressive and cunning hunter. He reasoned that the warm fur of animals must protect them from the cold. Lacking such a protective covering himself, he wrapped the skins of some animals he had killed around him, and found to his delight that they would keep him warm, too.





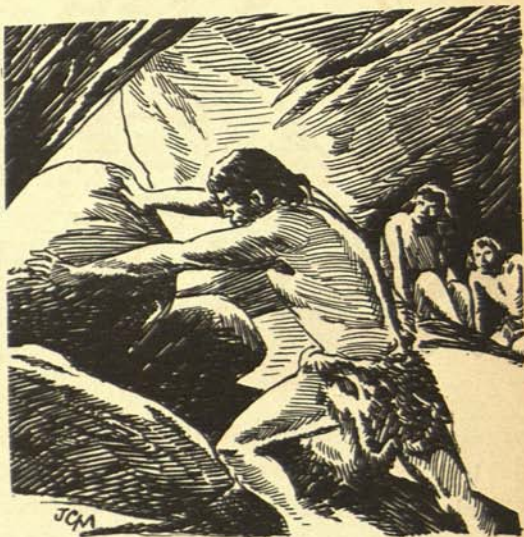


These were the first clothes. They were merely draped or tied loosely about the body. When the weather was cold, man would wear the fur next to his skin; when it was not so cold, he would turn the fur outside. And when it was hot, the garments were laid aside altogether. Man found that his new clothes protected him not only against the cold, but from briars and stinging insects.

From observing the habits of animals, man learned that a cave offered shelter from the snow and rain. Finding a cavern, and cautiously making sure that it was not occupied by bears or snakes, he made it his home. Now it only remained for him to get the upper hand of his animal foes.

## *Man's Home and Castle*

The cave became not only man's home, but his fortress as well. At close of day he barricaded the entrance with large stones to keep out prowling beasts, and went to sleep in the chill darkness with a greater feeling of security than he had ever known.



There was very little comfort in the first cave home. It shielded its occupants from the wind, the snow and the rain, but it was dark and cold and damp.

The first cave-dwellers did not venture far into deep caverns, for they had no fire and, without a torch to light their way, dared not explore the innermost recesses. They were forced to keep close to the entrance, within the light that came in from outside.





## *The Old Stone Age*

Benjamin Franklin described Man as a "tool-using animal." From earliest times prehistoric men had used sticks and stones as weapons. They must also have used them for such purposes as cracking nuts or knocking fruit from trees.

After man had become a hunter, he found he needed a tool with a sharp edge for cutting meat or carving a club. He soon discovered that a jagged stone with a sharp edge could be used for such tasks. Later the Neanderthaler found that, if there were no sharp stones lying around, he could take any stone and put a sharp edge on it by chipping it carefully with another stone.

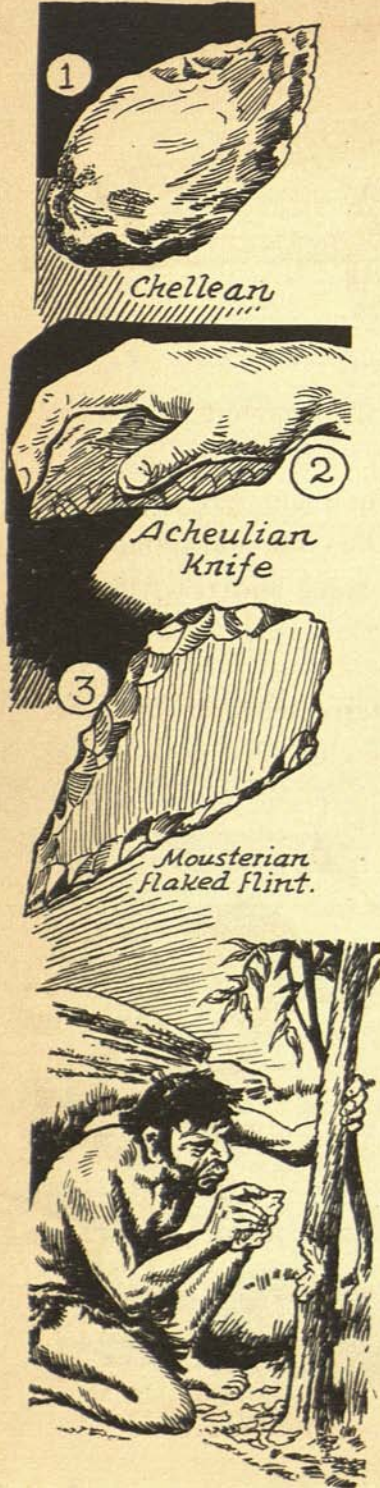
Once this lesson was learned, the primitive hunter began to fashion other tools and weapons of stone, so this elemental but important stage of man's slow rise to civilization came to be called the Palaeolithic, or Old Stone Age.



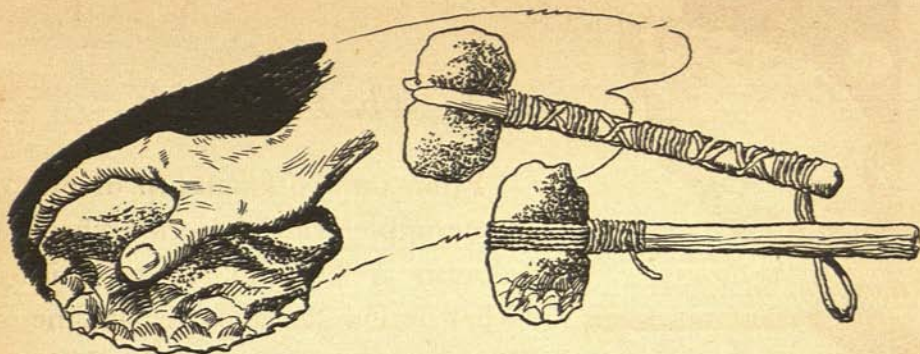
## *The First Tools*

From the workmanship of old stone implements modern archaeologists are able to recognize in what period and about what time they were produced. The oldest worked stones are large, heavy, flint-shaped and roughly chipped. Since the best of these were found in the cave of Chelles, in France, this type is termed Chellean (1). The Acheulean knife (2), found at St. Acheul, though dating from an early period, shows considerable improvement in finish.

The most skillful flint chippers of the Neanderthal cave men lived in the valley of the Dordogne in France, and the finest examples of their work were discovered in the cave of Le Moustier. For that reason the period when the Neanderthals were making their greatest progress, about 25,000 B.C., is called Mousterian (3).







All of the earliest tools, even the heaviest hand-axes, were grasped in the hand, and it was a long time before it occurred to man to make handles for them. We have seen how he had already learned to use the club, and found that the heavy, knobby end gave added force and reach to the stroke.

At last some enterprising hunter discovered that fastening a stone in the cleft end of the club, first with tough, flexible withes, and later with animal sinews or raw-hide thongs, gave him a much more deadly weapon, which, if one side of the stone were given a cutting edge, could also serve as an axe. Thus the stone hatchet was born, and remained for countless centuries man's most powerful weapon and most useful tool.



## *The Spear*

Next, the spear, merely a long, straight, pointed stick, made of any hardwood that was handy, was added to man's arsenal of weapons. To us the spear may seem a simple thing, but it marked a great advance. It gave the prehistoric huntsman a weapon to thrust into the vitals of a dangerous wild animal while keeping out of range of its teeth and claws.

Of course, the wooden spearhead soon broke or split, so eventually it was replaced by stone. As time went on, men took great care and pains in fashioning these weapons, for

their very lives depended upon them. Also, the man with the best weapons came to be looked up to by other men.

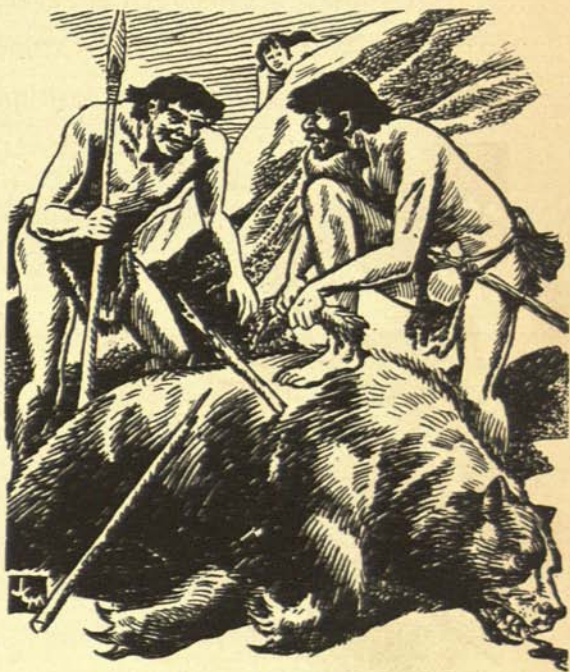






Simple as they were, man's new weapons gave him a reassuring feeling he had never known before — confidence. Boldly he sallied forth with stout spear and stone hatchet to hunt the savage beasts that so long had preyed upon him.

Man had turned the tables on the dreaded wild brotherhood of fang and claw. For ages he had been the hunted: a timid, furtive creature, ever fleeing for his life. Now it was his turn to be the hunter!



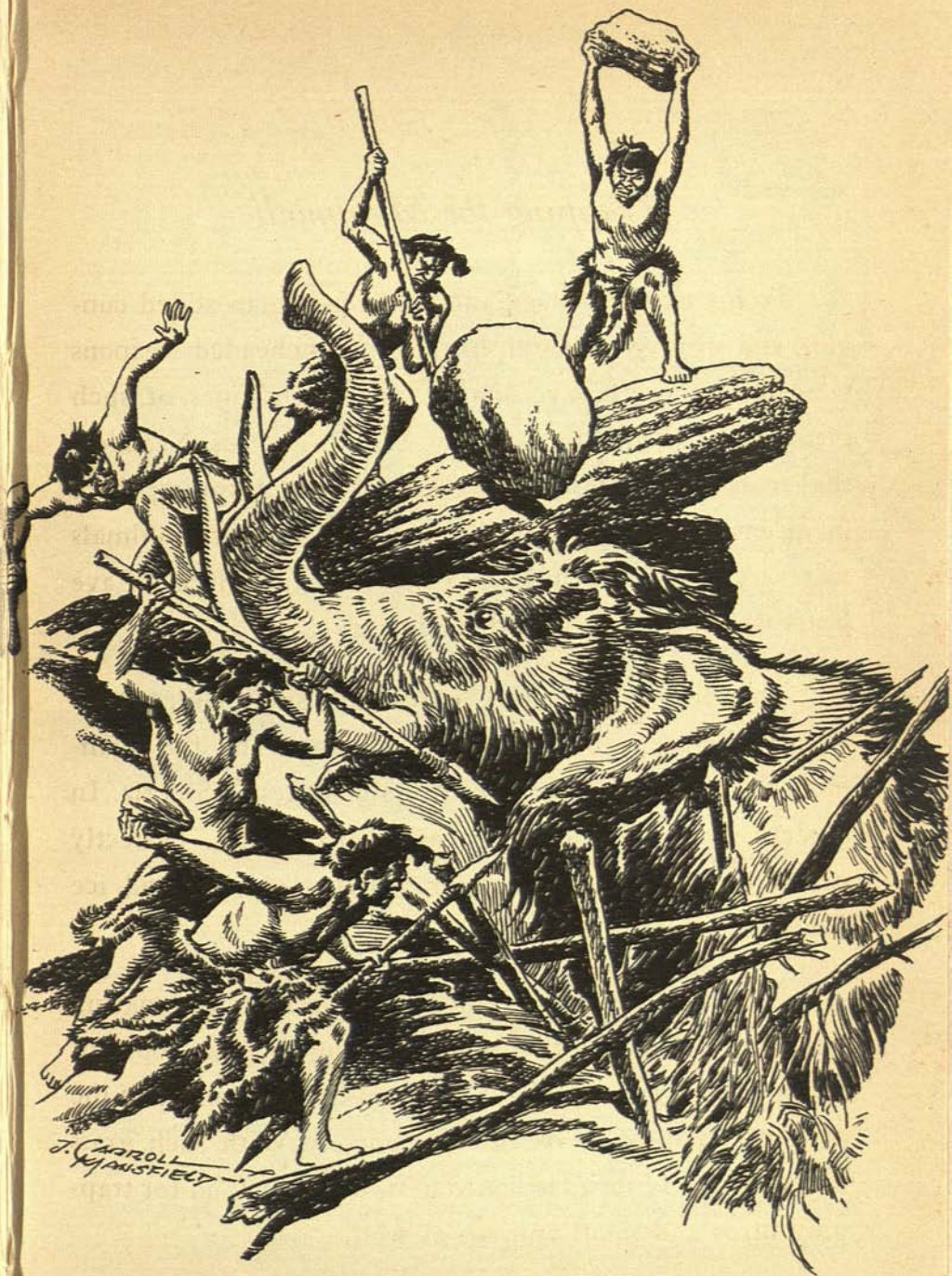
## *Trapping the Mammoth*

To his rising courage and confidence man added cunning and strategy. Though his crude stoneheaded weapons were not very effective against the tough hides of such giants as the mammoth and the woolly rhinoceros, Neanderthal man boldly hunted these huge beasts, trapping them by means of concealed pitfalls, dug in the trails the animals were accustomed to follow to the watering place. Cave bears were also caught in this manner.

This strategy must have been highly successful, for the woolly rhinoceros was soon exterminated, and the mammoth fled out of Europe into the cold wastes of Siberia. In modern times frozen specimens of mammoths, perfectly preserved, have been found in Siberian glaciers and ice fields.

Primitive hunters invented many devices for snaring small game. Neanderthal men, learning to plait ropes of tough grasses, may also have invented the forerunner of the cowboy's lasso, with its running noose. With such grass ropes and cords, they fashioned nets for fishing and for trapping birds and small animals as well.





*Neanderthal Men Trapping the Hairy Mammoth in a Pitfall*





## *Man Discovers Fire*



Fortunately for mankind, Palaeolithic men accidentally stumbled upon the secret of the thing most needed to stimulate human progress: Fire—that cooks our food, heats our homes, melts metals and generates the steam that turns the wheels of modern industry and transportation.

Man's first acquaintance with this strange new force came, most probably, when he saw the forest set ablaze by a bolt of lightning. Fearfully, wonderingly, a few more venturesome cave-men approached the burning woods and,



awed by the lurid spectacle, marveled at the heat thrown off by the fire. Picking up some burning sticks, they found that fire must be handled gingerly or it would "bite."

Observing that the flame spread from one stick to another, a resourceful cave-dweller carried a burning brand home, and astonished his family by keeping fire "alive" by feeding it dry sticks of wood.

That night the damp, dark cavern glowed with a warmth and light and cheer that man had never experienced before. Fascinated, the cave-dwellers squatted around the little blaze, watching the leaping flames with open-eyed wonder, as delighted as a child with a new toy.

At last, one by one, the family dropped off to sleep. Alas, in the morning they awoke to find with dismay that the fire had died.



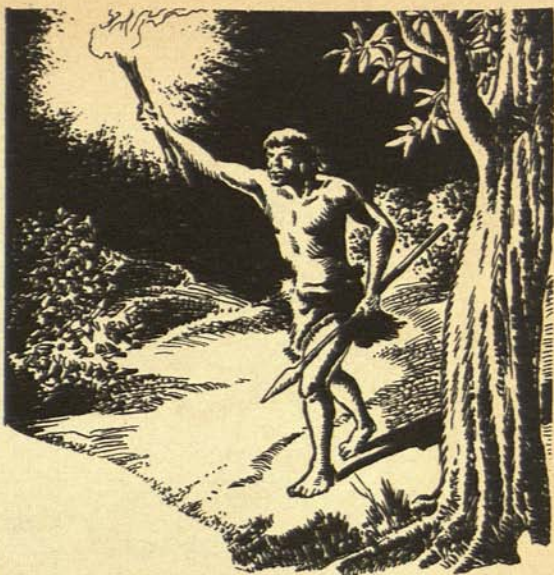


Man knew of no way to bring fire back to life, and so its blessed warmth and light became but a fading memory. Then one day a hunter was sharpening and polishing the point of a hardwood spear on a chunk of soft wood. As he rubbed, he was surprised to find the wood getting hot to the touch. Curious to see what would happen, he rubbed harder than ever.

Finally a little wisp of smoke came curling up; a hot spot broke into a tiny flame, which spread to some dead leaves. Man had found the secret of *making* fire! Later he found other ways of producing fire by friction.



It was a great thing for man to possess the magic formula for making fire whenever he wanted it. Now he had the torch to light his path by night and illuminate the dark crannies of his cave.



Fire added to man's growing feeling of security, for its glare frightened away wild beasts that approached the cave in their nocturnal prowlings.

The discovery of the secret of fire-making led to the art of cooking. This probably came about through the happy accident of dropping meat into the fire and finding that this improved the flavor. Then, too, though primitive man never dreamed of it, cooking safe-guarded his health by destroying any parasites that might be lurking in raw meat.

Perhaps most important of all, fire was the weapon by which man triumphed over cold weather. No more did he have to migrate before the snows, but with the comforting warmth of fire, he could withstand the rigors of winter in cold regions.

## *The Neanderthal Story Ends*

We have followed the fortunes of the little Neanderthals over a period of nearly three hundred thousand years, and seen them slowly toiling, step by step, up the steep road of human progress. Bit by bit we have pieced together the scattered fragments of a lost story, and seen these primitive people reach a stage of civilization where they have become equipped to make more rapid advances. But it was not the destiny of these grotesque little folk to carry on to the peak.



Suddenly, at this interesting point, something happens. The course of prehistory becomes obscured, a veil of darkness descends, blotting out the scene. When it lifts, the Neanderthals are gone, never to be seen again.

Of course, these people didn't melt into thin air. You may be sure there was some solid reason for their disappearance.





## CRO-MAGNON MAN

About 12,000 B.C. a new race of men suddenly appeared on the scene in Western Europe. Tall, well-formed and fair-skinned, these newcomers are considered by all authorities to have been the earliest known representatives of Homo Sapiens, Thinking Man, and the direct ancestors of modern Europeans.

*Cro-Magnon Man.*



Strange to say, very little is known of these tall invaders. Their skeletons were first discovered in Cro-Magnon caves in the valley of the Dordogne in France, hence all prehistoric men of this type are called Cro-

Magnon men, or Cro-Magnards. It is believed that these hardy strangers came from the east and south, but nobody knows exactly where they came from because no traces of their original homeland have ever been found. Here is a real mystery. How could these men have been developing for thousands of years without leaving some trace of themselves? The following possible explanation makes a fascinating story.



## *Early Mediterranean Races*

One hundred and forty centuries ago the water level of the great Mediterranean Basin was

two hundred and forty feet lower than it is today, and in place of the present inland sea, there were then two land-locked prehistoric lakes, separated from each other by a broad land bridge that later was to become the "boot" of Italy.

On the shores of these lakes, though having little or no contact with each other, dwelt three races of men. On the northern rim of the Western Lake lived the tall, fair-skinned Cro-Magnon People, who had already made considerable progress toward civilization. To the East of the Cro-Magnards lived a race of shorter, dark-haired, olive-skinned men, whom ethnologists have termed Grimaldi Folk, and from whom may have sprung many present-day Mediterranean peoples.

On the sandy, southern shores of the lakes roamed dark-skinned men, who probably had intermingled with the more primitive negroid sub-men of the hinterlands of Africa.

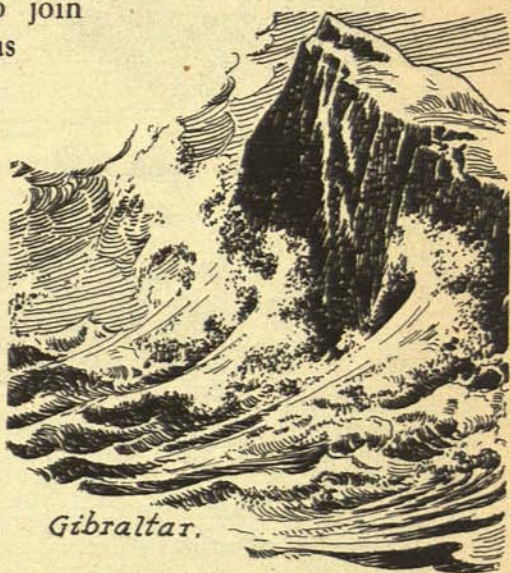


## *The Rising of the Waters*

Far to the north the receding ice fields of the last glacial wave were melting fast, and a deluge of water was pouring back into the sea. Gales from the west sent the rising waters of the Atlantic pounding upon the coasts of Europe. At the same time the rapidly melting ice cap poured floods down the rivers flowing southward to form what is now the Adriatic Sea, and fill it to overflowing. Soon the waters of the Adriatic spilled over to unite with those of the Eastern Lake, which in their turn burst through, between Sicily and Africa, to the Western Lake.

This rising of the waters, together with an untimely sinking of the lands, combined to cause a great natural cataclysm. Finally the waters of the Mediterranean, which by now had assumed its present shape and size, poured through the narrow upland valley, which ever since has remained the Strait of Gibraltar, to join the Atlantic. This tremendous inundation is believed to have been the basis of the Biblical Story of the Deluge.

Many Cro-Magnards perished in the flood. Those who could get away in time fled to high ground, leaving their cave homes, the graves of their forefathers and every trace of their

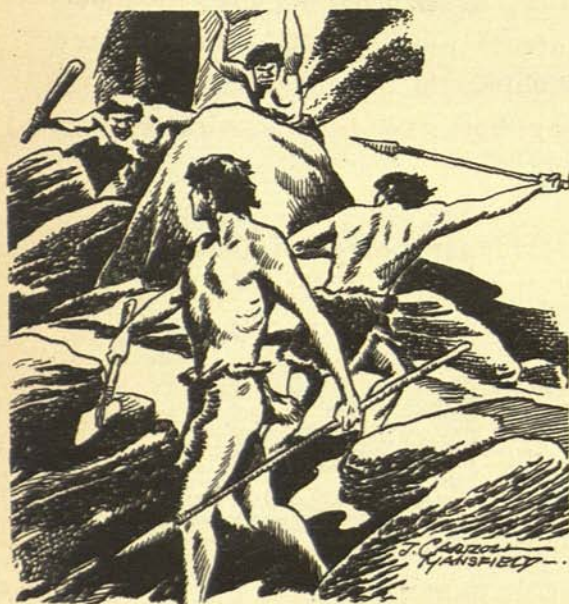


*Gibraltar.*

primitive culture submerged forever beneath the new sea, the Mediterranean.

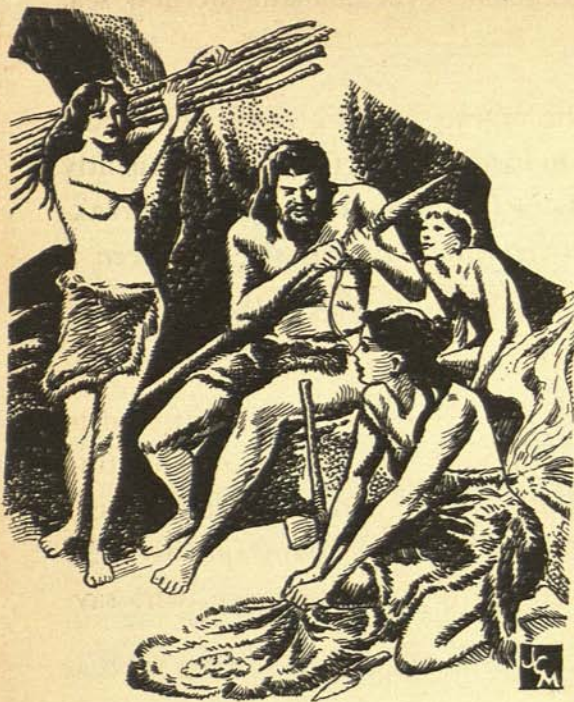
At the same time the raging Atlantic swept across low coastal lands of Europe to form the North Sea, permanently cutting off the British Isles from the mainland, and breaking through to the Baltic, which previously had been a freshwater lake. Since that time the shape of Europe has remained the same.

The survivors of the Cro-Magnon people scattered to the north and west, seeking new cave homes and hunting grounds. As they penetrated through the mountain passes into the regions that are now France, Spain and Switzerland, they encountered hostile Neanderthal men, who savagely opposed the intruders.



Desperate, bloody conflicts took place. Probably the stronger, better-armed Cro-Magnards drove out and destroyed their smaller, more primitive enemies, for from then on Neanderthals were seen no more.





## *Cro-Magnon Men in Western Europe*

These conflicts were not pitched battles, for both the Cro-Magnards and Neanderthals were united

only in small family groups, and the advance of the Cro-Magnards across Europe must have been a series of small but fierce combats.

The victorious Cro-Magnards here and there took possession of the caves and flint quarries of Neanderthal men, but the newcomers seem to have used the caves only for winter bases.

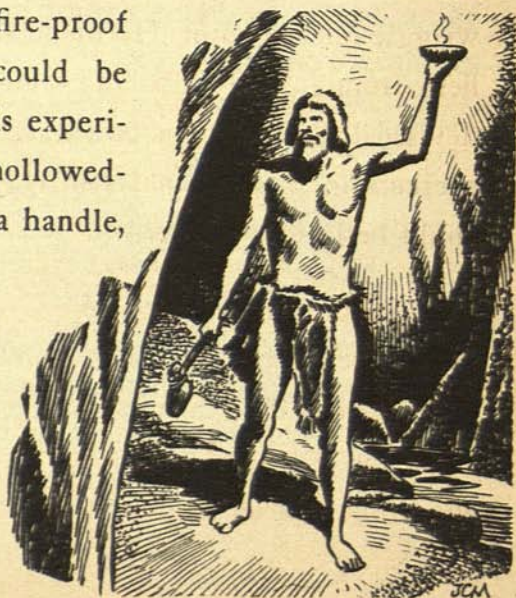
Sturdy, active and athletic, they spent most of the open weather outdoors, trailing the herds of reindeer, which they prized for their meat and skins. It was not long before the Cro-Magnards had overrun most of Europe.

## *Cro-Magnon Inventions*

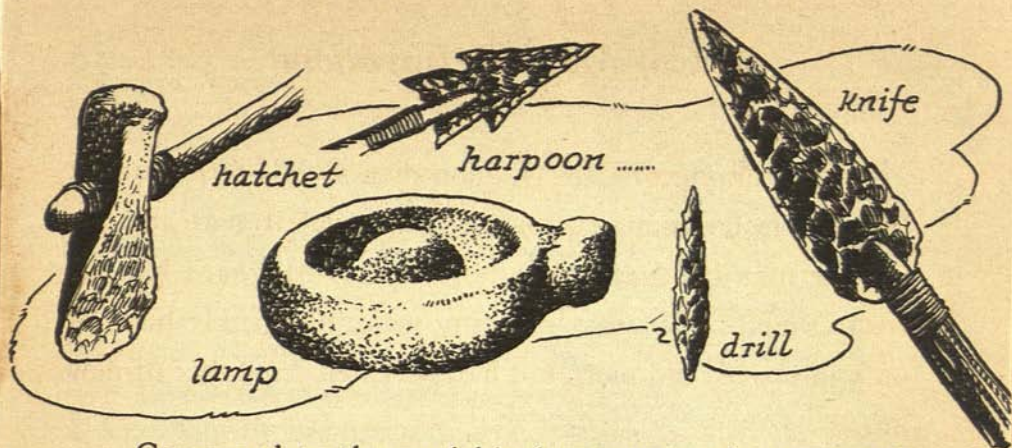
The coming of Cro-Magnon men to Western Europe brought faster human progress. More intelligent and inventive than the Neanderthaler, the Cro-Magnard had already found better ways of doing many things. He had not only improved old tools, but had invented a number of new ones.

He increased his range in bringing down big game by learning to throw his spear straight to the mark and designed a special, light, well-balanced dart, the first javelin.

He found a better way to light his cave than the old smoking, flickering torch. This new man observed that grease, dripping from meat cooking over the fire, burned with a bright, steady light. Having made this discovery, he set about to invent a fire-proof holder in which fat could be burned. The result of his experiments was a shallow, hollowed-out soapstone dish with a handle, the first lamp.







Compared to those of his forerunners, the tools and weapons of the Cro-Magnard were works of art. His cutting tools were lighter, better shaped and much keener. His hammers, axes and hatchets were better balanced. He selected the best and hardest flints to work with, and all his implements had a smooth, workman-like finish.

He invented many other useful things; the harpoon for spearing fish, made with barbs so that the fish could not wriggle off the point. He made scrapers for removing the flesh from animal pelts, and scalers for cleaning fish. He devised little drills for boring holes in wood or shell, and piercers for making holes in leather so that several skins could be laced together.

Another invention of the Cro-Magnard was the sling. Not to be confused with the modern elastic sling-shot, the prehistoric sling was merely a loop of leather in which a stone was placed and then let fly, after being whirled about the slinger's head to gather momentum.



## *The Bow and Arrow*

Cro-Magnon man invented a much better and quicker way of making fire by friction, the bow drill, which in the hands of an expert can produce fire in less than ten seconds, as modern Boy Scouts can testify. This method of fire making is still used by Eskimos.

Possibly a lucky slip of the finger that caused the taut bowstring to shoot the spindle from the hand of the fire maker led to the invention of antiquity's greatest weapon, the bow and arrow. The primitive hunter could now bring down dangerous beasts from a safe distance, and, with this silent weapon, even remain unseen by his quarry.

Arrowheads became the most important form of flintwork. They were fashioned in many shapes and sizes, for many purposes.





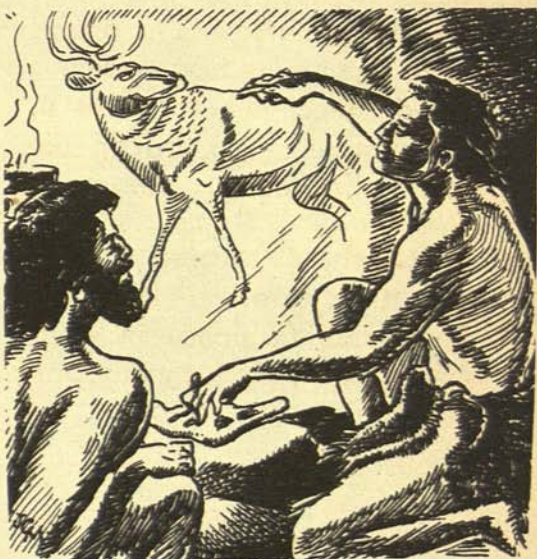


### *Cro-Magnon Cave Paintings*

One of the most surprising things about the Cro-Magnon people was that among them were men who could draw and paint remarkably well; better than any other people down to the dawn of historic times.

They left their cave walls and ceilings covered with life-like murals of the wild animals of their day, many of which would do credit to a modern artist.

Most of the wall paintings were done in the innermost chambers of the cave, and it is believed that the viewing of them was connected with some sort of ritual to bring good luck to the hunters and make the wild game abundant. Before setting out on the chase, the hunter would dance before a wall painting of the animal he hoped to slay. As he danced, he would thrust his spear at the heart of the painted beast. If his blows went



true to the mark, he went on his way confident that he would bring down the game he desired.

Strangest of all the relics of Cro-Magnon art are the small clay statuettes of fat women. Was this the cave man's ideal of feminine beauty, and were all Cro-Magnon women that stout? The answer is "yes" and "no."



It seems likely that such females, probably the first priestesses or matriarchs, were worshipped as goddesses of fertility, and grew fat on gifts of the choicest food. Recent discoveries of evidences of such worship in the rock caverns of Malta confirm this belief.



A stout wife was highly prized by primitive man. A plump, well-fed spouse showed the world that he was a good provider and a mighty hunter.





Though still a savage, man had come a long way from the old brutish life of the early Neanderthaler. Living had become much more than just finding food and keeping from being devoured by wild animals.

The family hearth had grown to be a precious, heart-warming thing to him — home! Mating was more solemn and permanent, for man now knew that his children were part of himself. He accepted responsibility for them, and provided for them until they were old enough to fend for themselves.

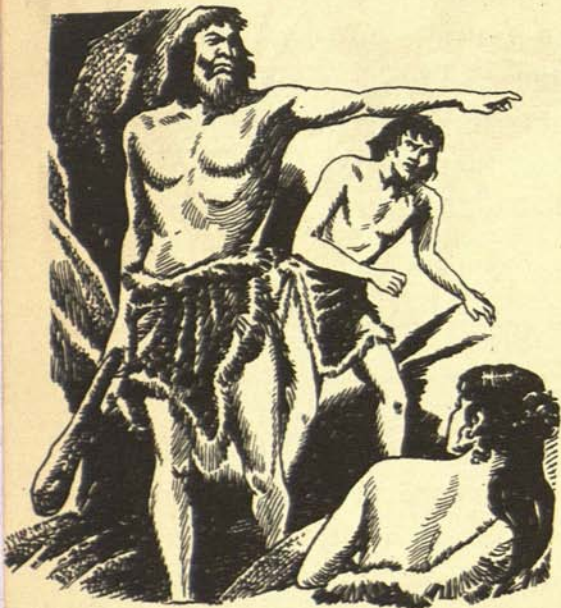
In the Old Stone Age there were no tribes or nations, and no unity among men except in small family groups. Parents and children stuck together for mutual aid and protection in a savage, hostile world.

## *Palaeolithic Life with Father*

However, life in a Palaeolithic family group was far from being all sweetness and light. In an epoch when selfish might prevailed and only the strong survived, the father ruled the family group by sheer brute force rather than by loving kindness.

Of course, there were many exceptions, and perhaps even the most brutal cave man felt tenderly toward his family as long as they obeyed him, enjoyed playing with his children, and would have laid down his life to protect them. But it is true that an Old Stone Age father, observing restlessness and revolt among some of his sons, would drive them from the family cave before they were old enough and strong

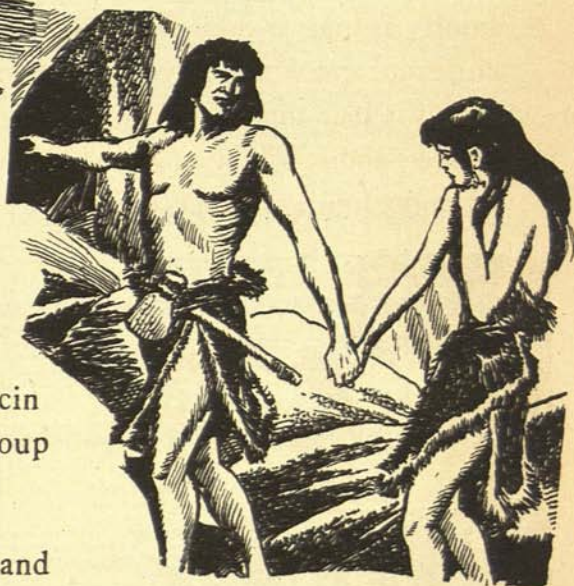
enough to successfully challenge his authority. From this much we can gather that "Life with Father" in those early times was rather an ordeal.







The banished youth would drift around the neighborhood for awhile. Finally, growing lonely and tiring of bachelor life, he would locate a vacant cave to live in, steal a likely girl from some other



family living in the vicinity, and start a family group of his own.

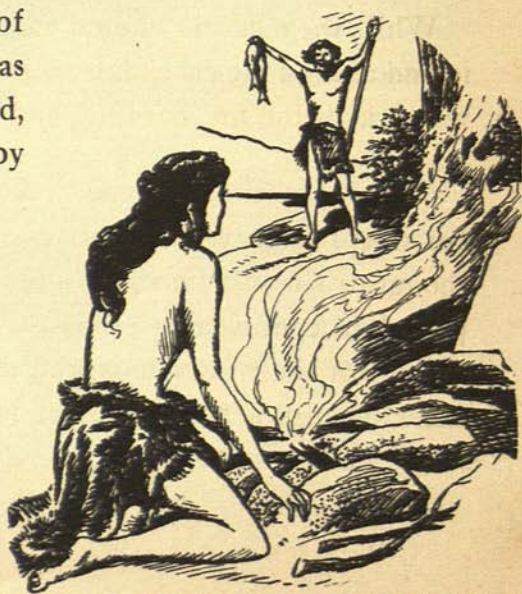
For all its violence and frequent brutality, this was for ages the only form of marriage known, and therefore the expected thing. Most cave girls must have looked forward to being carried off someday, and perhaps in some cases made only a show of resistance to their abductors.



Doubtless the stolen bride quickly became reconciled to the new life, and tried to make the cave home as comfortable as possible for her mate and her children.

For one thing, in those early days there seems to have been what was regarded as a fair and natural division of labor between men and women, each sex taking over certain duties for which they were best fitted.

Man was the protector and provider; woman the mother and home maker. There were no idlers then, for life was too great a struggle to support any lazy drones. Everyone was obliged to stand on his own feet. Children were given some sort of light work to do as soon as they could toddle around, and learned their tasks by imitating their elders.





Like the animals, man had to go down to the water to drink. Except when there was a spring, or a water hole, close by, he had to find a cave home that was situated near a brook, river or lake. Living near the water, men were able to catch fish, which they speared with crude harpoons or slender tridents with barbs of bone. Fishing with hook and line seems to have been the invention of later men. The Cro-Magnon hunter also stalked game that came down to the watering place.



While the menfolk hunted and fished, the women worked in and around the cave, dressed skins for garments, gathered wood, kept the fire burning, and took care of the children.

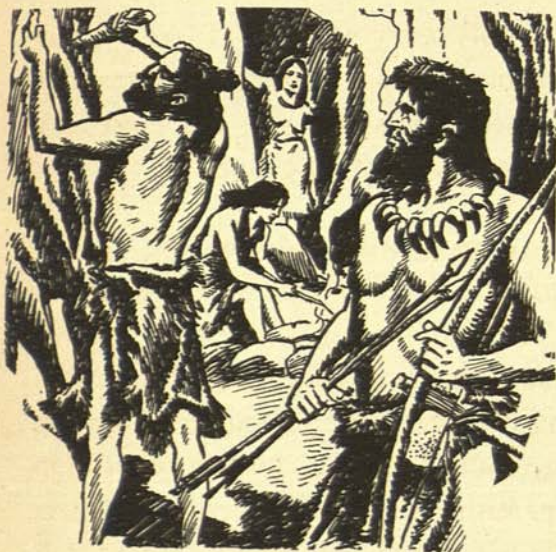
The prehistoric home maker learned to make large fur wraps by lacing a number of small skins together with thongs or sinews. This led to the art of sewing. At the approach of cold weather, the cave mother sewed up her offspring for the winter in warm, shapeless coverings of furs, the Palaeolithic forerunner of long, woolen underwear.

Later the family group grew larger. It may have been that fathers had found it to their advantage to let grown sons remain at the family fireside, where they could make themselves useful to the family as a whole. Besides, there is "safety in numbers."

These sons took mates from other family groups, and brought them to the home cave to live. In time children were born to them, and so the family circle grew.

Caves have been found with several connecting chambers, among them a workshop, where evidently a number of people worked, chipping flints. By this time certain members of the family may have begun to render special services according to their talents. A crippled son, who was

particularly clever with his hands, might remain at home making tools and weapons, while another son, strong and active, would spend all his time hunting.





There were other causes that contributed to the enlargement of the family group.

Primitive man was polygamous, and a mighty hunter might have three or four wives, or as many more as he could provide for.



On the other hand, polyandry was just as freely practiced, and it was not uncommon for a strapping, attractive Amazon to have several husbands and rule the roost as a matriarch, or mother-ruler, of a family group.

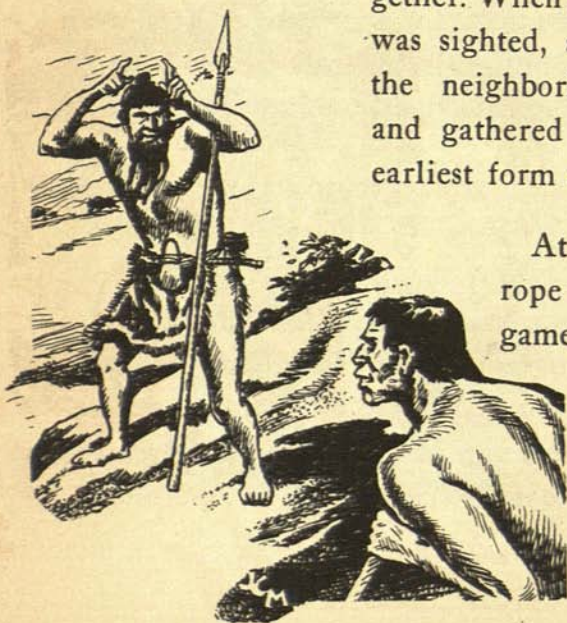
There must have been great pride in the family unit, which for so long remained a little world to itself. The rule "Every Man for Himself" might have been applied to the family group to describe human society at this period. But man was beginning to feel a little friendlier and more dependent on other men, outsiders, and closer co-operation was not far off. Perhaps his sons' wives, homesick for their relatives, persuaded him to make friends with their families.

Man might have continued to lead a lone-wolf existence but circumstances forced him at times to cooperate with other men. Neighboring family groups were obliged to unite for common

defense against an invading enemy that threatened to drive them all from their cave homes and hunting grounds.



It may have been the hunt that first brought men together. When a large herd of big game was sighted, all the cave-dwellers in the neighborhood were summoned, and gathered for a grand hunt, the earliest form of community effort.



At this period Western Europe was swarming with wild game. The broad grasslands were black with herds of reindeer and European bison, which were eagerly hunted for their meat and skins.

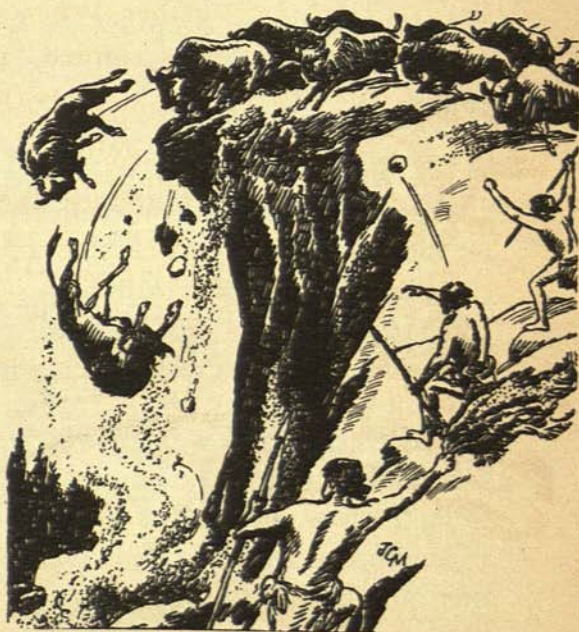


The hunters, advancing noiselessly, would surround a herd of bison on three sides. Then, with loud yells, they stampeded the huge, shaggy beasts, and drove them up the slope of a high hill that dropped away precipitously on the far side.

The foremost bison, blind with panic, charged head-long over the precipice, and all the hunters had to do was to skin and cut up the carcasses at the base of the cliff. When enough animals had been killed, the hunters permitted the rest of the herd to escape.

Prehistoric men were not unnecessarily cruel, nor did they kill wantonly, just for "sport." Animals were their vital food supply. Men had no means of preserving meat, and therefore killed no more at one time than they actually needed.

After a successful hunt man found a new pleasure in a great feast around the leaping fires. He came to enjoy this genial mingling with other men, and looked forward to these festive joyous occasions.





## *Early Love of Finery*

Cave people, just like moderns, had a passion for decoration and loved to dress up. Since most of the time they went about nearly naked, they made up for the lack of clothes with paint and ornaments. They fashioned elaborate ornaments of colored shells and carved bone. Often certain decorations added to the wearer's reputation. A necklace of bear's claws, for instance, would show that he was a brave and skillful hunter.

Beautiful furs were prized by both sexes as garments. On special occasions gaudy effects were achieved by painting or staining designs on the face and body with colored clays or the juices of certain plants. Only two thousand years ago the ancient Britons were still painting diamond designs on their bodies with woad, a blue stain.

Both men and women wore their hair long, and often braided it into plaits or pigtails, or rolled it into a topknot. Sometimes women rolled their hair into tight curls, held in place with combs and pins of carved bone or shell. Some men plaited their long beards.

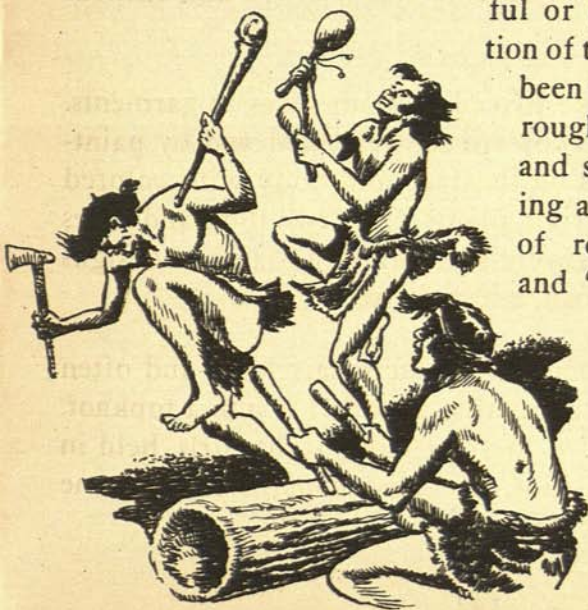


## *Palaeolithic Play*

You may be sure that cave children found plenty of time for play. These youngsters laughed, squealed, whooped, scampered and scrambled, climbed trees, skipped flat stones across the pond and played hide-and-seek, just as frisky young humans have done ever since. The hunter's game was the Palaeolithic equivalent of "cops and robbers."



The amusements of their elders were no more thoughtful or dignified. The recreation of these savages must have been violent and boisterous; rough and tumble games and sports, running, jumping and wrestling with lots of rowdy practical jokes and "horseplay."



Man may have already begun to dance, shuffling, stamping and leaping to the booming, rhythmic drumbeat of a hollow log.

## *Fears and Superstitions*

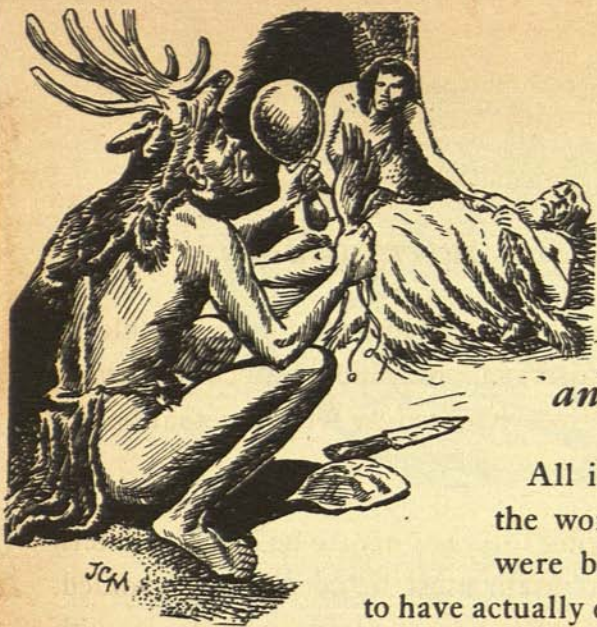
Man at this time had no religion, only a jumble of superstitions and primitive taboos. He had no consciousness of the human soul, but was haunted by fear of actual bodily harm and bad luck.

In the awe-inspiring forces of nature he saw gods, stern and terrifying. Their wrath must be continually avoided. With offerings and rituals, he hoped to make peace with these fearsome deities.



Everywhere, he thought, uncanny, supernatural, hostile forces were at work, dogging his footsteps to do him evil. In his ignorance he believed that the only weapon with which he could protect himself against these unseen enemies was magic and witchcraft.



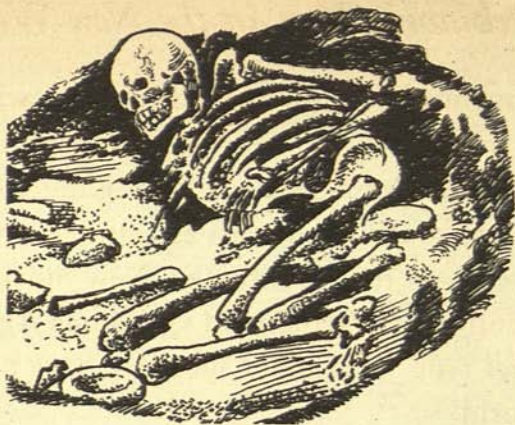


## *Witch-Doctors and Medicine Men*

All illness was regarded as the work of evil spirits who were believed in some cases to have actually entered the body of the sick person. These must be fought and driven out by "good magic." From this belief arose the medicine man, or witch-doctor, who tried to drive out the evil forces with charms, chants, frightening noises and "hocus-pocus."

Nevertheless man may have already made a few simple, beneficial discoveries in the field of medicine, perhaps observing that certain herbs were helpful in the treatment of wounds and injuries. We have no way of knowing how far these people had gone in treating such injuries as broken bones, but you may be sure that if a man was hurt or sick in those days, he was unfortunate indeed.

Perhaps these primitive hunters were seldom sick because of the rugged, active outdoor life they led. An examination of skeletons shows that tooth decay, so common today, was rare in prehistoric times.



## *Old Age and Death in the Old Stone Age*

With all the risks of life in the Stone Age few persons lived past forty. If one was disabled to the point where he became a burden, or could not keep up with the rest, he was led out to some remote place and either put to death or left to die of starvation or exposure.

Primitive man always associated death with violence. Even when he saw a relative die of natural causes, he fancied the victim had been struck down by an invisible foe. This idea of violence has persisted subconsciously to this day. We still say, "He had an attack of appendicitis," or "she was stricken with pneumonia."

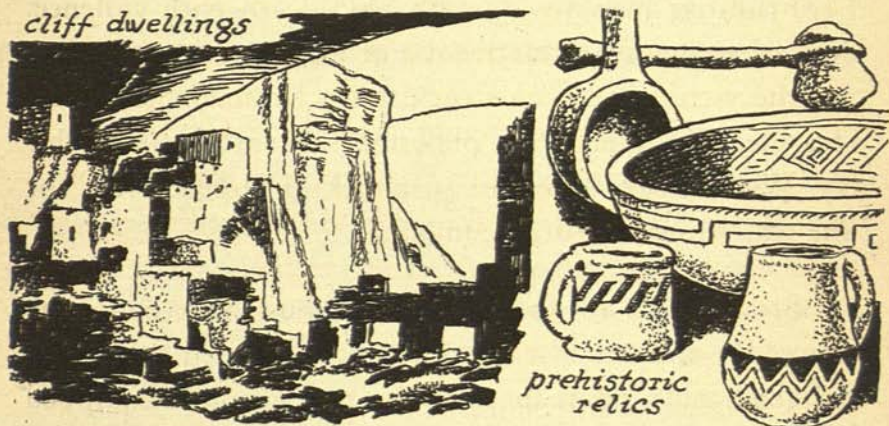
Strangest of all, these cave men must have had some vague idea of a life after death, for they buried their dead with food, tools and weapons, so that they would be equipped to take up a new existence beyond the grave.

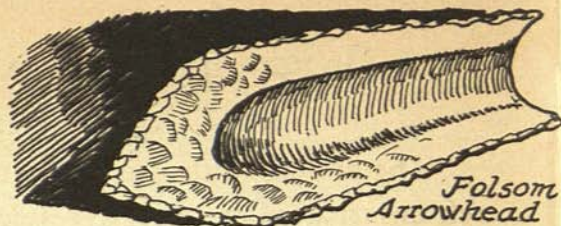


## *Prehistoric Men in the New World*

We now turn from the old world to see what had been happening in the new. Archaeologists believe that the North and South American continents were uninhabited by men until some twelve thousand years ago, and then were entered by men already in the Neolithic or New Stone Age period of human culture. No remains of Old Stone Age men of the Neanderthal type, or of older sub-men, have been found in the new world.

In 1912 Dr. Ales Hrdlicka, the great ethnologist (that is, student of peoples), established the fact that America was first entered by Neolithic hunters from somewhere in the heart of Asia, probably Tibet. For a long time it had been believed that the prehistoric Basket Makers who built the picturesque cliff dwellings in the canyons of New Mexico were the first settlers of America. But something happened to change this belief.





## *An Arrowhead and Three Thousand Years*

In 1925 a strange prehistoric arrowhead was found near Folsom, New Mexico, that proved that there had been much earlier settlers in America than the Basket Makers. This arrowhead was unlike any other previously found in America. It was of a different shape and was grooved on both sides to fit the halves of a split arrowshaft. It may have been an Asiatic arrowhead, or it may not even have been an arrowhead at all, but the stone tip of a dart thrown by hand.

Stranger still, it was found imbedded in the skeleton of an extinct species of bison twice as large as the bison of to-day. Such a bison had not lived since the Pleistocene Period, estimated to have ended at least fifteen thousand years ago. At that rate this strange arrowhead must have been shot by one of the first Asiatic hunters that migrated to America, three thousand years earlier than had formerly been believed.



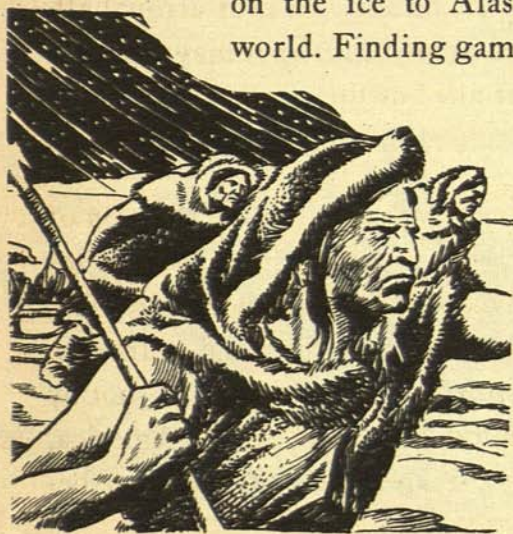
## *The Saga of Folsom Men*

The finding of the Folsom arrowhead suggests a great trek unsurpassed in history. Fifteen thousand years ago a band of Mongoloid hunters, tiring of their cold, barren homeland in the high valleys of Tibet, decided to migrate in search of better hunting grounds in the warm lands far to the south, but their way to India was blocked by the towering ranges of the Himalayas.

Marching eastward to the shore of the Pacific, they found their path to the south again barred, this time by hostile Chinese. Forced to retreat to the north, the hunters wandered along the coasts of Siberia, living on fish and mussels, on reindeer and an occasional hairy mammoth.

Arriving at the frozen Bering Strait, they crossed over on the ice to Alaska and entered the new world. Finding game abundant and no men to

oppose them, they kept pushing south. These were the ancestors of the Indians that in time spread over the Americas from Alaska to Patagonia.



## *The First Chief*

In Europe the old family group had grown too big for the family father to handle, and men were groping for government by law. When a number of men, unrelated to each other, decided to share one large cave with their women and children a serious question arose.

All were accustomed to father-rule, but since these families were not blood relatives, there could be no natural father-ruler. They seized upon an idea known as "totemism" to give them a common relationship. Lacking a common father, the members of the new group adopted some animal, perhaps the bear, to be their imaginary common ancestor and guardian.

The group would then be known as the Bear Clan. After that, children were born little "Bears." Totemism gradually died out and each man assumed responsibility for his own immediate family. They chose one of their number to be the chief of the group.







## *Broad-Headed Immigrants*

At various times before the dawn of the Historic Era, streams of immigrants from other parts of the old world filtered into Europe.

About 11,000 B.C. hunting bands of "broad-headed" Aryans from the East were coming up the Danube in pursuit of the herds of reindeer. Entering Western Europe, some of the strangers may have mingled with the "long-headed" Cro-Magnards, but for the most part they seem to have kept to themselves.

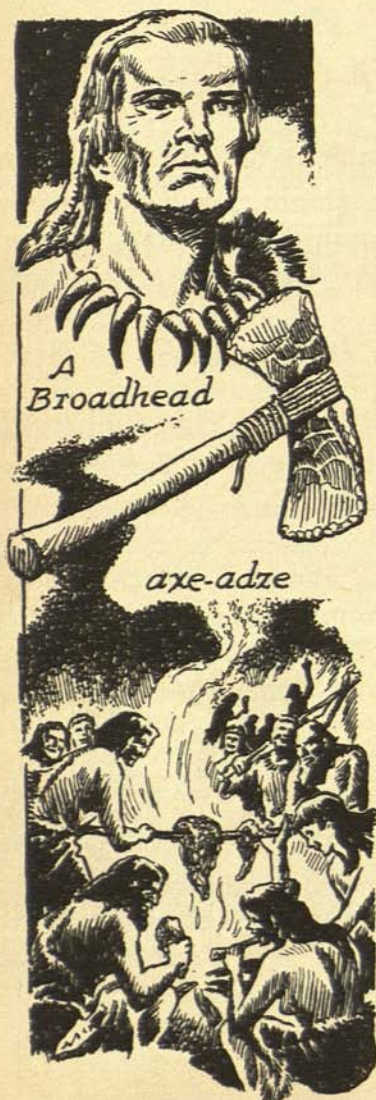
Remains of these broad-headed people and their primitive culture have been found in the Kuban region, north of the Caucasus Mountains, on the shores of the Caspian Sea in South Russia, which may have been their long-established homeland.

At Solutre in France the Broadheads left abundant traces of the culture they had brought with them. Their flint tools were of a different type, beautifully wrought. Some of their knives were almost as hard and thin as steel blades, and chipped to a razor's edge. The Broadheads

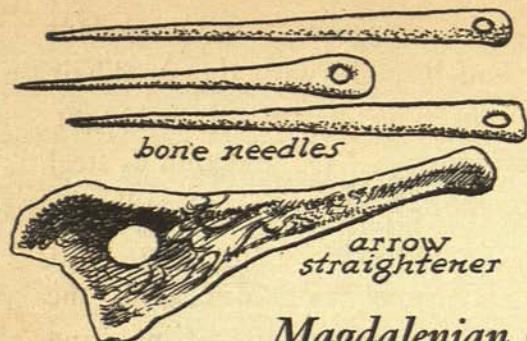
brought with them their stone axe-adze, and the queer custom of painting their dead with red ochre, probably in the belief that it would supply them with the blood of life in the next world.

The region of Solutre must have been a favorite hunting center, perhaps a yearly hunting rendezvous for many centuries, and the scene of barbaric feasts, as evidenced by the great piles of bones of wild horses, reindeer and bison found there.

Considerable numbers of Broadheads settled along the Danube and south of that river.







## Magdalenian Carving

In 10,000 B.C., or thereabout, for these prehistoric periods overlap, flintwork and carving on bone and horn reached its peak of perfection in the so-called Magdalenian Epoch, named for the Cave of La Madeleine in the Valley of the Dordogne in France.

Some of the carving of that day is exquisite and was lavished on deerhorn dagger hilts and strange batons. The Magdalenian carver also produced sharp bodkins for piercing holes in leather.

One of the most curious inventions of this era was the spear-thrower of bone, which added considerable push to the throwing of the weapon.



The Old Stone Age was drawing to its close, and the race of men stood on the threshold of civilization. The continued moderating of the climate in the temperate zones, together with the growth of spoken languages, and the mingling of strange peoples that promoted the exchange of ideas, provided favorable conditions for an up-surge of progress toward a better way of life.

Up to now man had been just a savage hunter, a primitive food gatherer. Soon, however, the hunting age was destined to pass, first into the pastoral, then into the agricultural. These changes were not swift and sudden, but gradually developed where the best opportunities offered. Civilized life is believed to have begun in the Near East, whence it spread to the West. The new way of life was to take man out of the cave forever.







## *Basket Making*

Every new tool that man invented, every new thing he learned to make, helped raise him little by little to a higher plane of civilization. Often one invention led to another, opening a new field of progress. For instance, did you know that ordinary basket weaving was the "mother" of many other arts, among them cloth and rug weaving, pottery making and boat building? We shall see how that happened.

One of the earliest handicrafts learned by Stone Age women was basket weaving. Inventions are usually developed to fill some particular need, and the cave wives needed something to carry things around in. The basket met this need. Possibly the woman who invented the first basket got the idea from observing how certain birds wove their nests.

## *The Invention of Pottery*

Primitive man had long been familiar with the peculiar properties of clay. These would have come to his attention when he happened to walk through some wet clay and noticed the deeply modeled footprints he left behind him. Later he observed that wet clay would dry into a hard, rigid substance under the hot sun.

Picking up some soft clay, he found he could mold it into any shape, which would be retained after the clay dried. From early Cro-Magnon times clay had been a favorite medium of prehistoric sculptors. Perhaps one day a clever cave woman, having to carry sand in a basket but finding that much of the sand sifted out, overcame this difficulty by coating her basket with wet clay from the riverbank. Finishing her task, she left the clay-covered basket outside the cave where it quickly dried and hardened in the hot sun. That

night it rained, and in the morning, when the woman came out to get her basket, she was astonished to find it transformed into a strange hard vessel holding water . . . the first piece of pottery!





Pottery solved the problem of carrying water and keeping it on hand in the cave. The first sun-baked pots were not very satisfactory. They broke easily and, if they held water too long, they absorbed the moisture and returned to the wet clay state. Potters learned to overcome this difficulty by baking the pots in the fire. Firing removed all the moisture from the clay and, once fired, it never returned to its original state.

From long practice the early potters found other ways of making pots and how to work the clay to get the best results. They discovered it was not necessary to first make a basket to make a pot, though they still used that method at times. All the Neolithic pottery was molded by hand. The potter's wheel was a much later invention.



As time went on, man found many other uses for pottery. Before it was invented he drank water with his mouth to the stream, or with cupped hands. Later he drank from shells, gourds, or the hollow horns of animals. Sometimes he carried water in bags made of animal skins. Now he began to make pottery cups and plates, bowls and jars for storing food and other things, vessels of many shapes and sizes for many purposes.

The cave wife found that she could cook in earthenware pots, though not directly over the fire.

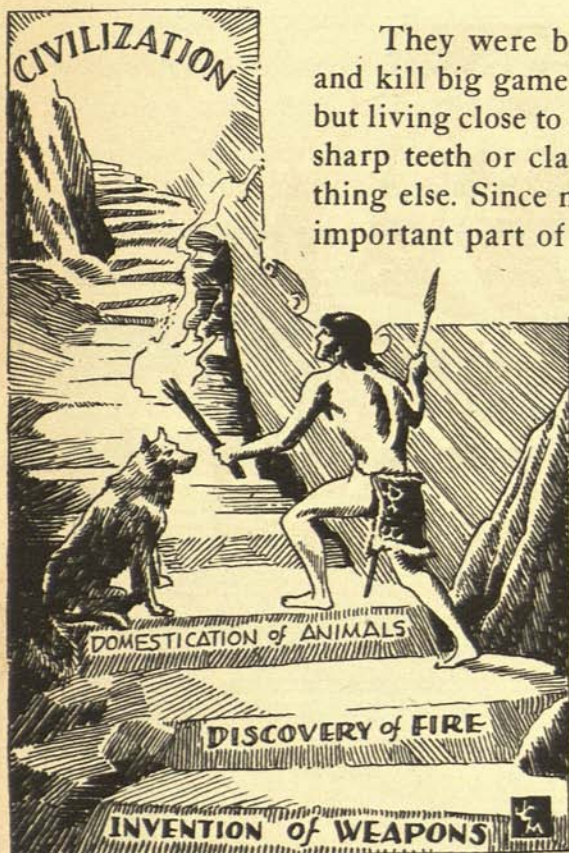




# THE DOMESTICATION OF ANIMALS

It would be hard to say what was man's most important step in the direction of civilization but certainly the domestication of animals was one of them.

The taming and herding of animals is so familiar to us that it seems strange the idea was so long occurring to our prehistoric ancestors. Perhaps they were dimly conscious of having once been the hunted prey of wild beasts and still harbored an instinctive fear of animals.



They were brave enough to go out and kill big game to satisfy their hunger but living close to a large animal that had sharp teeth or claws or horns was something else. Since meat was then the most important part of their diet, they had to go hunting for their daily food.

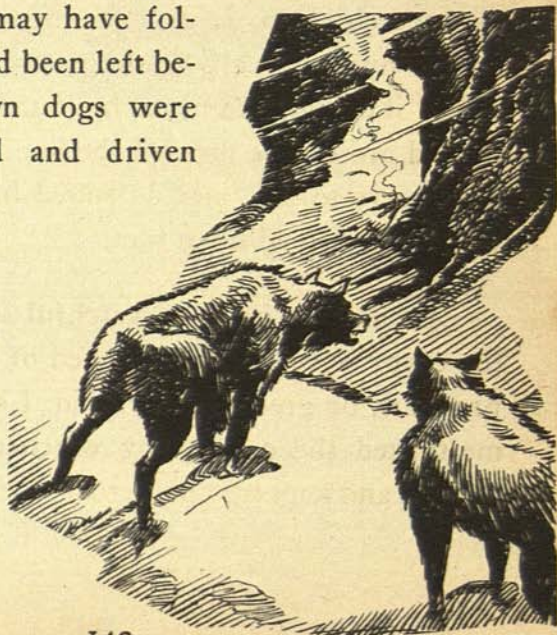
Making once wild beasts become tame and docile, and keeping them conveniently close at hand so that a man no longer had to walk miles to get fresh meat on the hoof, must have been a welcome change to many primitive hunters.



## *Man's First Animal Ally, the Dog*

It is doubtful if the dog was ever sought as game by primitive hunters. The canines were fierce and cunning and elusive, and being lean and muscular were not as desirable as a plump deer.

On cold Palaeolithic winter nights, gaunt, wolf-like, hunger-driven dogs came sniffing for cast-off bones around the cave homes of men. On some of these foraging expeditions young puppies may have followed their parents and been left behind when the grown dogs were suddenly discovered and driven away.



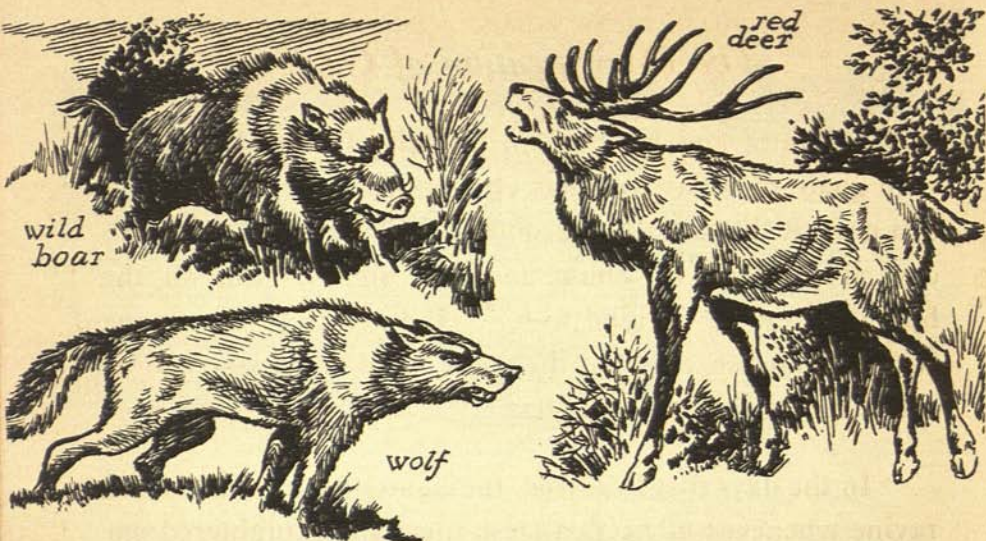




Cave children found the puppies and made pets of the lovable little creatures. From that time on the dog was man's constant companion and most loyal friend, the comrade on the hunt, the guardian of the home, the family pet.

Prehistoric men appreciated the dog's true worth. It became the gentle playmate and the strong protector of its master's children. It gave its master unswerving devotion that no human loyalty could match, whether the master deserved it or not, and never hesitated to give its life for him if need arose. The dog led the hunter to the game, brought the quarry to bay, and defended his master if the hunted wild beast turned upon him.

At night it was the watchful sentinel at the mouth of the cave; its ready bark warned of the approach of hostile prowlers, or greeted the friend. Later, after men had domesticated sheep, the dog watched the flock, fought off wolves, and kept his charges from straying.



### *Wild Game of Neolithic Europe*

In the Neolithic Age in Europe many of the wild beasts of the time of the Neanderthal men and the first Cro-Magnards had vanished from the scene. With the spreading of the great forests over Western and Central Europe, many species of animals that graze on the broad, open plains, like the reindeer and bison, had migrated far to the north.

But wild game was plentiful. In the place of the reindeer, the lordly red deer had become the prize of the hunter. Fierce wild boars fed on the fallen acorns in oak groves and packs of wolves howled after dark. Flocks of wild sheep and goats dotted the grasslands, and wild horses, too, were abundant.

The woods were full of foxes, hares and squirrels, and the winged game included wild ducks and geese, grouse and pheasants.



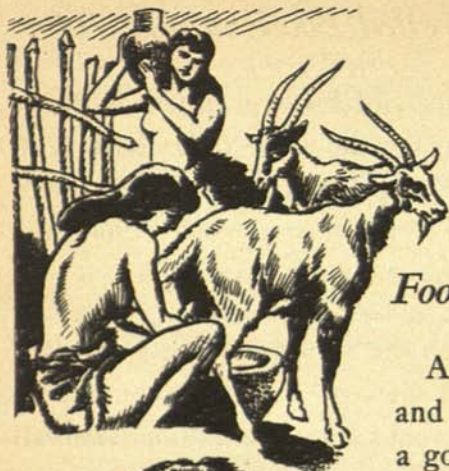
## *The Domestication of Goats*

A hunter and his sons, in pursuit of a small flock of wild goats, may have one day chased the elusive animals into a narrow, high-walled, dead-end ravine near the hunter's cave. Tired from the chase, and with night coming on, the hunter shrewdly decided to block the mouth of the ravine with a crude fence so that the goats could not escape and he could catch them the next day.

In the days that followed, the hunter went to the closed ravine whenever he needed fresh meat and slaughtered one of the goats, meanwhile bringing food and water regularly for the captive animals. Soon, to the hunter's surprise, the goats became so tame and dependent upon his care, that they made no attempt to get away.

For the first time he had a supply of fresh meat on the hoof, without having to go hunting for it. It began to dawn upon him that he had made a great discovery.





### *Foods—in Milk and Cheese*

At this point the hunter's wife and daughters were struck with a good idea. Reasoning that, if goat's milk was good for its young, it could not be harmful to humans, they milked the she-goats and found the milk rich and satisfying. Milk soon became an important part of the human diet.



Later the women of the hunter's family learned to make milk into cheese, a palatable and nourishing food with a special advantage, something new to man. It could be stored away to be eaten at some future time.

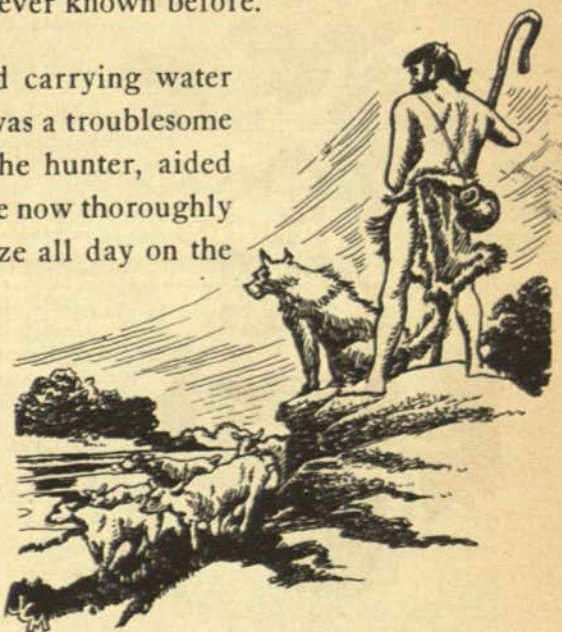


## *The First Controlled Food Supply*

Delighted with the success of his experiment with the goats, the hunter decided to try the same thing with wild sheep. Rounding up and penning a small flock, he found that these animals could be tamed just as easily. Soon the hunter had all the livestock he could take care of.

Man had stumbled upon the way to have a controlled and dependable food supply all year 'round. Whenever he needed fresh meat, whether goat's meat, mutton or lamb, all he had to do was go to the pen and select an animal. Unless he particularly craved some venison or bison steak to vary his diet, he didn't have to go hunting any more. This gave man a security he had never known before.

Gathering food and carrying water for his sheep and goats was a troublesome task, so each morning the hunter, aided by his trusty dog, took the now thoroughly tame animals out to graze all day on the grassy banks of the stream that flowed past his cave and drove them back to their pen at sunset.



## *From Hunter to Herdsman*

The hunter was surprised that his sheep and goats multiplied rapidly under his care, and before long he had more animals than he needed or knew what to do with. So wisely, he traded his surplus animals with neighboring cave dwellers in exchange for articles he needed but had not had time to make for himself. He also bartered fresh mutton for venison.

The neighbors started herds of their own, and soon the surrounding hillsides were dotted with droves of grazing sheep and goats.

But certain things came up that man had not foreseen.

As his animals multiplied he was obliged to devote more and more of his time to them. When the sheep and goats had eaten

all the grass close by, he had to drive them in search of other patches of grass. These wanderings sometimes took him many miles from his cave home.



Thus in a short time these prehistoric men found their way



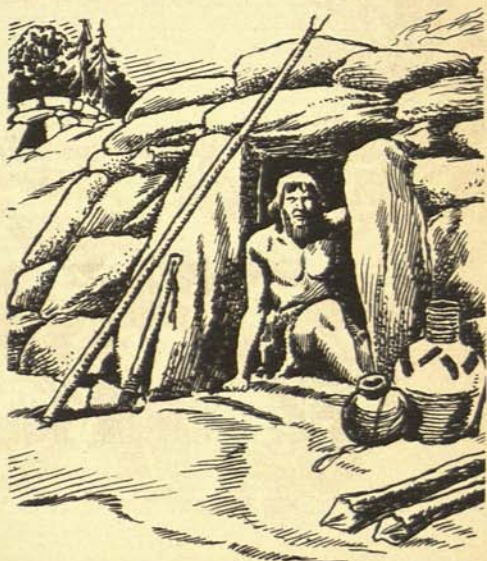
of life completely changed. They had always been hunters; now, almost overnight, they had become wandering shepherds and herdsmen.

## *The First Man-Made Dwellings*

His new pastoral life took man out of the cave. Now he wandered far afield seeking the best grasslands for his sheep and goats. Frequently he took his family with him.

Often the roving shepherd found himself in open country where there were no caves to afford shelter from the wind and rain. Camping for the night, he erected a rough, thatched bower of branches, or a low tent of skins, the first man-made dwellings.

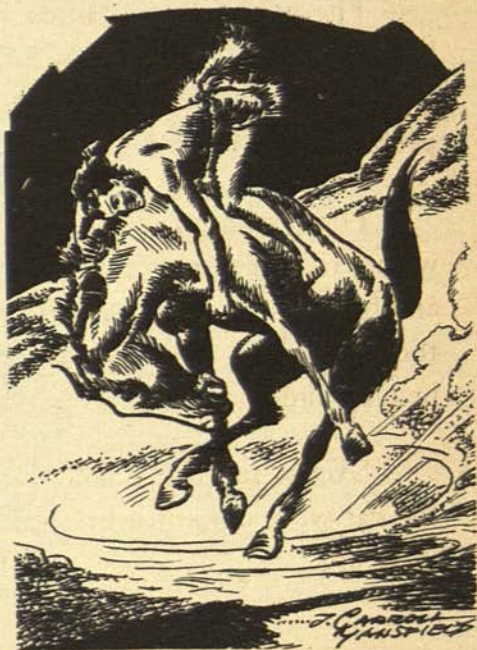
If the shepherd chose to dwell permanently on the plain beside some stream or water hole, he built a crude, low structure of stones, logs and earth over a pit dug in the ground, in imitation of his former cave home.



## *The Taming of the Horse*

Ten thousand years ago herds of shaggy little horses ran wild over the grasslands of Central and Western Europe. Strange to say, it had not yet occurred to primitive men that these useful and lovable animals could easily be tamed and trained to serve them, and so they were hunted as game.

Many a time man had watched the graceful, fleet-footed animals and wished he could run as fast. Finally it dawned upon some clever hunter that he, too, could travel as fast, if he were riding on the horse's back. Then one day some agile, venturesome prehistoric "bronco-buster" succeeded in taming and riding a wild horse. From that time on men had steeds to carry them swiftly on long journeys. Like the dog, the horse became not only man's trusty servant, but his friend and comrade.







### *Prehistoric Barnyard Animals*

Man found by experience that many other wild creatures could be tamed, and as time went by, other animals were domesticated. This process was helped by finding young animals and raising them as household pets.

The wild ass was tamed and became one of the chief beasts of burden of ancient times, particularly in the Near East. Soon the grunting pig joined the other animals in the prehistoric barnyard.

The taming of wild cattle supplied the early herdsman with a rich new source of milk and meat, butter and cheese, and hides for leather. Later teams of oxen were used to pull the plow and, after the invention of the wheel, to draw heavily laden carts.

Except in Burma and Egypt, the domestic fowl and the cat were unknown until after the beginning of the historic era.

His growing flocks not only gave man freedom from want, but also new responsibilities and a new outlook. He was no longer a mere *food gatherer*; he was now a *food-producer*.

For the first time he became sharply conscious of his possessions and began to grasp the importance of the rights of private property. He had to be ready to protect his herd against wolves and human thieves. He began to get a satisfying, comforting feeling of wealth and substance, and as his flocks multiplied, his standing in the community likewise increased. But so did his problems and duties.

Increased security had a refining, mellowing effect upon men. They began to lead a more civilized and expansive life. They learned the advantages of living at peace with their neighbors, and of friendly cooperation.





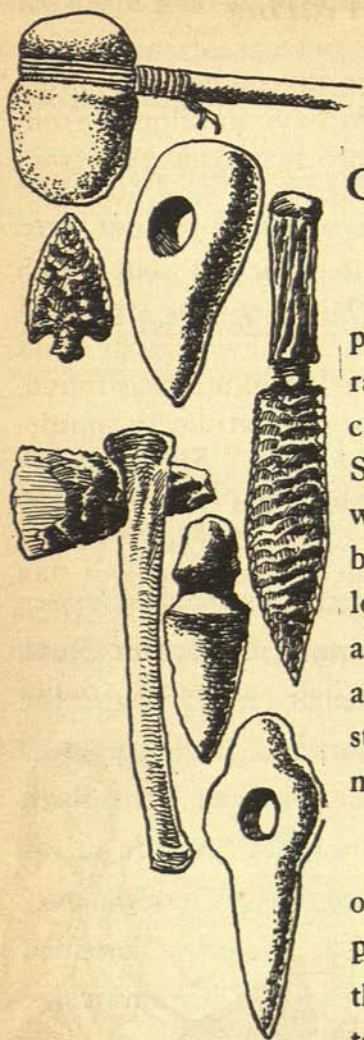
The first trade, barter and exchange, sprang up. Men swapped animals, skins, and meat and cheese for articles made of flint and bone, cloth, clay pots and shell ornaments.

No longer were the aged banished to die of starvation, now that there was food enough for all. Now the old were respected and venerated for their wisdom and experience. Wise old men or women were looked to for advice when important questions confronted the clan.

No more did a youth brutally kidnap a girl to be his mate. Instead, he wooed the maiden of his choice and, if she returned his love, bought her from her father. If the girl was pretty and strong, as well as an accomplished house-

keeper, her father could demand a high price for her, and, having paid it, the husband henceforth regarded his wife as his property. A mock abduction, however, remained a part of the marriage ritual.





## THE NEOLITHIC, OR NEW STONE AGE

All of these changes and improvements combined to raise the race of men to a higher plane of civilization. The Neolithic, or New Stone Age, took its name from new ways of working stone which had been developed. Flints were no longer shaped by laborious flaking and chipping but were now ground and polished, a process which gave stone tools and weapons an almost metallic smoothness and finish.

Outstanding among implements of new design were the polished stone picks and axes with perforated heads that could be fastened more securely to wooden or bone handles. The new stonework was only one of a number of advances that came at this time.



## *Spinning and Weaving*

One of these advances was the invention of spinning and weaving, the latter believed to have developed from basket making. The Neolithic weavers first made yarn from flax, which grows wild in Europe, and later from wool.

Somehow it was discovered that the fine but tough fibers inside the stalk of the flax plant could be separated and twisted by hand into a strong thread. Twisting by hand was slow work and soon a better way, spinning, was found. The prehistoric process of spinning was extremely simple.

The flax was prepared by soaking the plants in water, and then drying them in the sun. The stalks were then cracked open and the fibers separated. The strands of flax were combed and straightened and wound on a stick, called a distaff, which was held under the spinner's left arm. Next, flax strands were passed through a hole in a small, round stone, the spindle, which was held suspended by the strands from the spinner's right hand. Then the spinner spun the stone around, and as it rotated the flax strands were twisted into a thread.

It took a long time to spin enough yarn to make a piece of cloth, and since Neolithic mothers were busy with household duties and looking after their children, spinning became





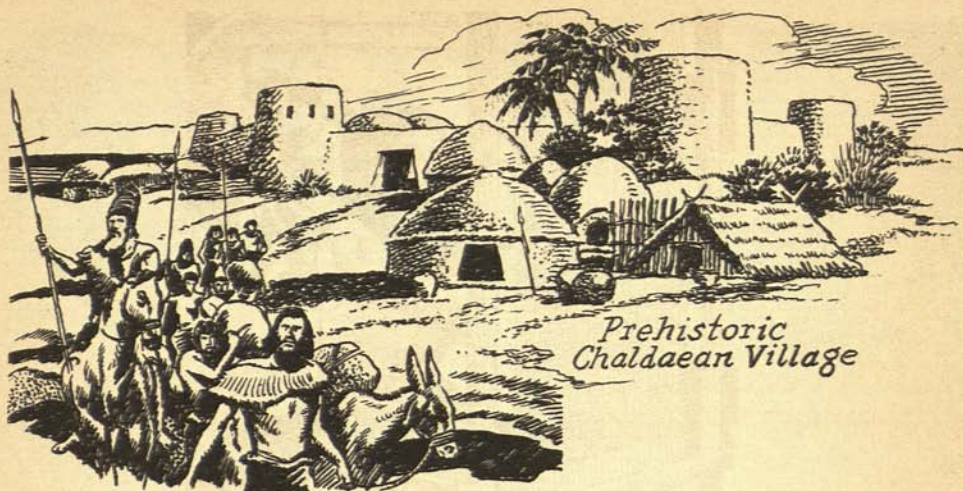
the particular task of single women. To this day, though they no longer spin, unmarried women are called spinsters.

The first weaving was also a simple process. The primitive loom on which the cloth was woven was merely a rough frame composed of wooden crossbars, hung from two upright posts set in the ground. The threads of the warp were strung up and down between the crossbars, and the weft threads were passed alternately under and over through the warp.

The coarse, plain-woven cloth produced by this primitive method was about thirty-six inches wide, which may account for the "cloth-yard" becoming a common measurement. Later, as the weavers became more expert, they developed different technics of weaving.

The first woven garments were not "tailored" to fit the form, but merely draped about the body. Long after weaving was invented, people continued to wear animal skins for work and everyday dress.





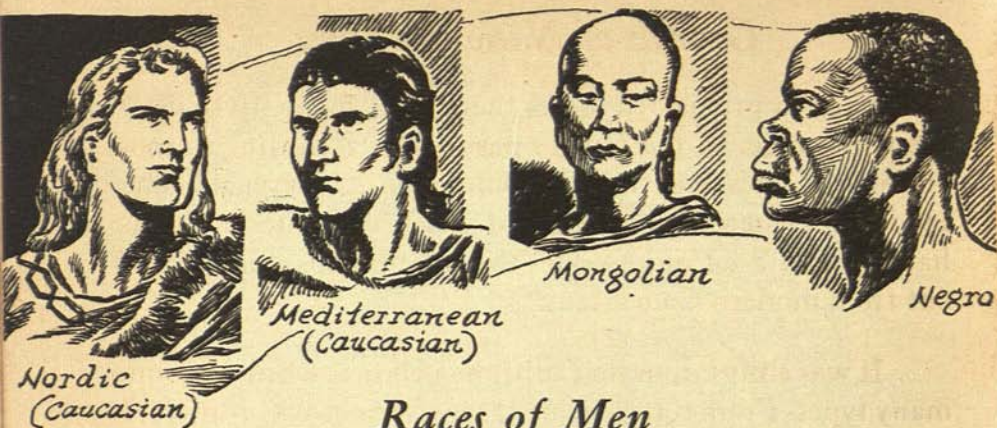
*Prehistoric  
Chaldaean Village*

## *The First Civilizations*

So far we have been tracing the progress of primitive men in Europe, but in other parts of the old world other groups and other breeds of men had been developing along the same lines independently, that is to say, with no contact among them.

In the Mesopotamian "Land of Two Rivers," in Iran, in parts of India and China, and beside the Nile in Egypt men had toiled upward from the Palaeolithic to the Neolithic stage. Once this plane had been reached some groups progressed toward civilization at a much faster pace than others.

The earliest and oldest cultures were those of Egypt and Mesopotamia, the others trailing them by several thousand years. After the civilization of the Near East had become well established, and the development of boats enabled men to cross large bodies of water, new ideas and products were carried westward to less advanced nations.



## *Races of Men*

Ever since *Homo Sapiens* (Thinking Man) emerged from the brutish sub-man the various major races of mankind had been evolving in different parts of the globe. The three great races, the white, the yellow and the black, each of which may be divided into many types, did not come into contact until they were already widely differentiated.

It was the processes of nature that caused groups of the same species, living in dissimilar environments and under different conditions for countless thousands of years, to grow to be quite unlike in appearance. Throughout the ages the influences of soil and climate had much to do with man's physical development.

The pigments of the skin of a race that had always lived exposed to the rays of the blazing equatorial sun would naturally be much darker than those of others. Combinations of chemicals in the water he drinks and in his regular diet, affect man's height, appearance and general physical make-up. Such things can bring about some change even in the span of a man's lifetime. Over thousands of years the changes would become much more pronounced.



## *Growth of National Types*

Even in prehistoric times there were many divisions of the white race. In the remote past when, according to most authorities, this race was developing in its original homeland, somewhere in the heart of Asia, all white men must have looked a lot more alike, though perhaps quite different from modern Caucasians.

It was emigration that split the original white race into many types. From time to time large bands of white men left the land of their origin and set out to the west, perhaps in search of more abundant hunting grounds. These roving hunters finally settled in parts of Europe, Southwest Asia and North Africa.

As time went on, groups that had continued to live for many generations in one particular locality began to take on a distinctive appearance influenced by the conditions of their environment, and to develop definite group and national characteristics. In the Near East by the beginning of historic times this distinction of appearance had become so pronounced that one had only to look at a man to say, "he is an Egyptian," or "he is a Chaldean."







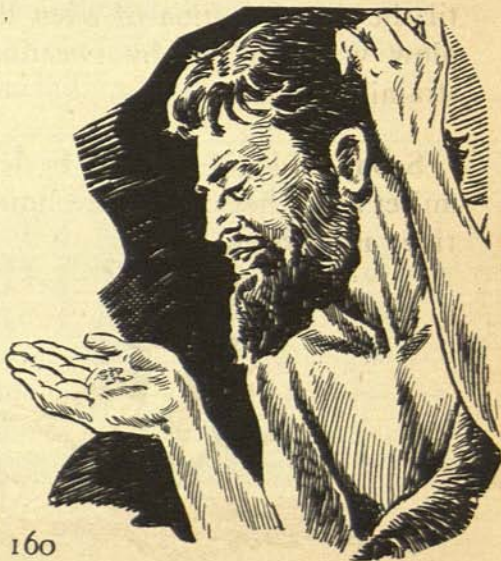
## *The Beginning of Agriculture*

Somewhere in the prehistoric "Cradles of Civilization," in the warm, fertile regions beside the Nile in

Egypt or the great rivers of Mesopotamia, Neolithic men first learned to till the soil and raise food by planting crops.

It was a red-letter day for the human race when an observant shepherd, lingering a few weeks with his flock in a spot where grass was abundant, noticed for the first time that new grass sprouted and sprang up from seeds that fell to the ground.

A great idea came to the shepherd. Why couldn't he gather the seeds and plant them in some other place where he wished to dwell, so that he would not have to drive his flock so far looking for grass? And might not the same thing be done with all kinds of wild grains and edible plants?





The experiment was a great success, the idea spread like wildfire, and soon men everywhere were turning to agriculture.

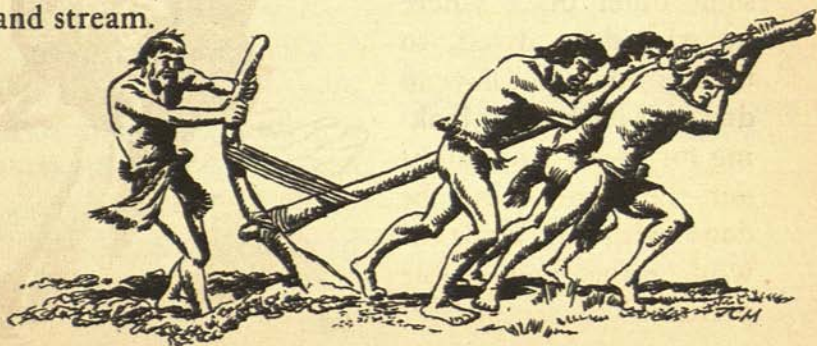
The early farmer noticed that the seeds had a better chance of taking root if the soil was broken up and softened. So before planting the seeds he laboriously scratched the ground with a crooked, pointed stick or a stag's antler. Soon he found that with a broad edged tool, the first wooden spade, he could turn up more dirt at a time.



From the spade the Neolithic farmer got the idea of the first plow, that combined two movements, one downward and one forward, for turning up the soil. Until the domestication of oxen the plow was dragged by sweating, straining humans.



Soon fields of wheat, barley, millet and other crops were lining river and stream.





## *Staff of Life*

Having harvested his wheat with a curved wooden sickle, the Neolithic farmer threshed it with a crude flail, a heavy, jointed club. The wheat was tossed in the air, the kernels dropping directly to the ground, while the wind blew the chaff aside.



The grain was gathered up and poured into the mortar, hollowed out from the trunk of a tree, and pounded and cracked with the pestle, a thick wooden club.

The farmer's wife learned to make the flour into a thick batter with milk and water, and bake unleavened bread-cakes on flat heated stones. Thus bread became the "staff of life."





## *The Harvest*

A bountiful harvest meant a plentiful store of food for the long winter, banishing the dreaded specter of famine. No wonder reaping time was a season of gladness and rejoicing. Farming also provided winter fodder for man's domestic animals.



Agriculture not only assured man of an adequate supply of food, but added many new edibles to his bill of fare. Beside grains, he learned to cultivate certain vegetables that had formerly grown in a wild state, among them cabbages, turnips, leeks, carrots, onions and beans.

As time went on, the Neolithic farmer learned many ways of producing better crops. He discovered that the soil must be fertilized, and where there was little rainfall, he learned to bring water to his fields through irrigation ditches.

The domestication of animals had taken man out of the cave. Now agriculture brought another sweeping change in his way of life.

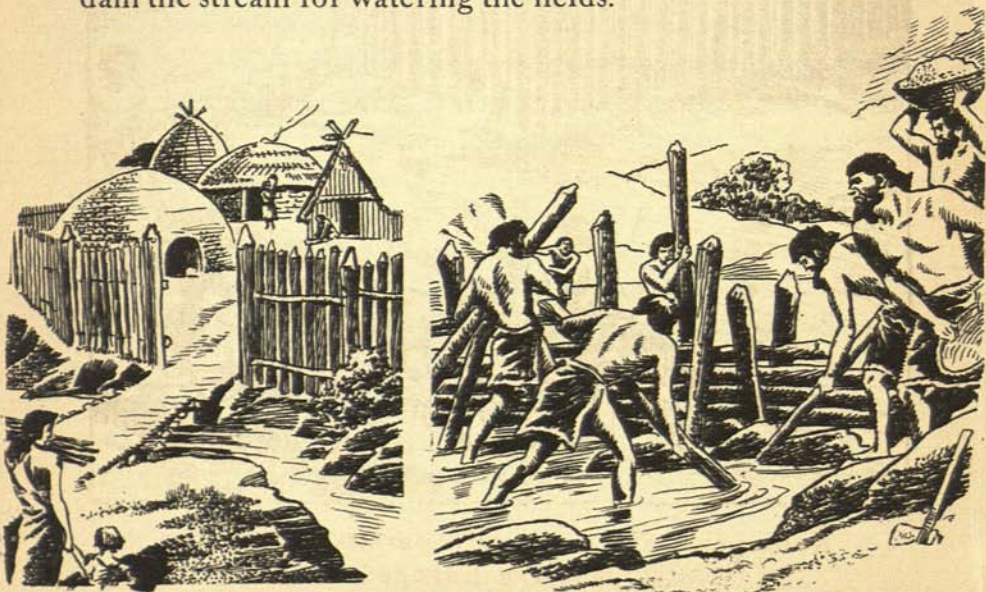
## *The First Villages*

Farming ties a man to one spot. He must remain there to plow the fields, to plant the seed, to cultivate and water the crops, and finally to reap the harvest. This work keeps him busy in the fields from spring until fall. By that time winter is close at hand.

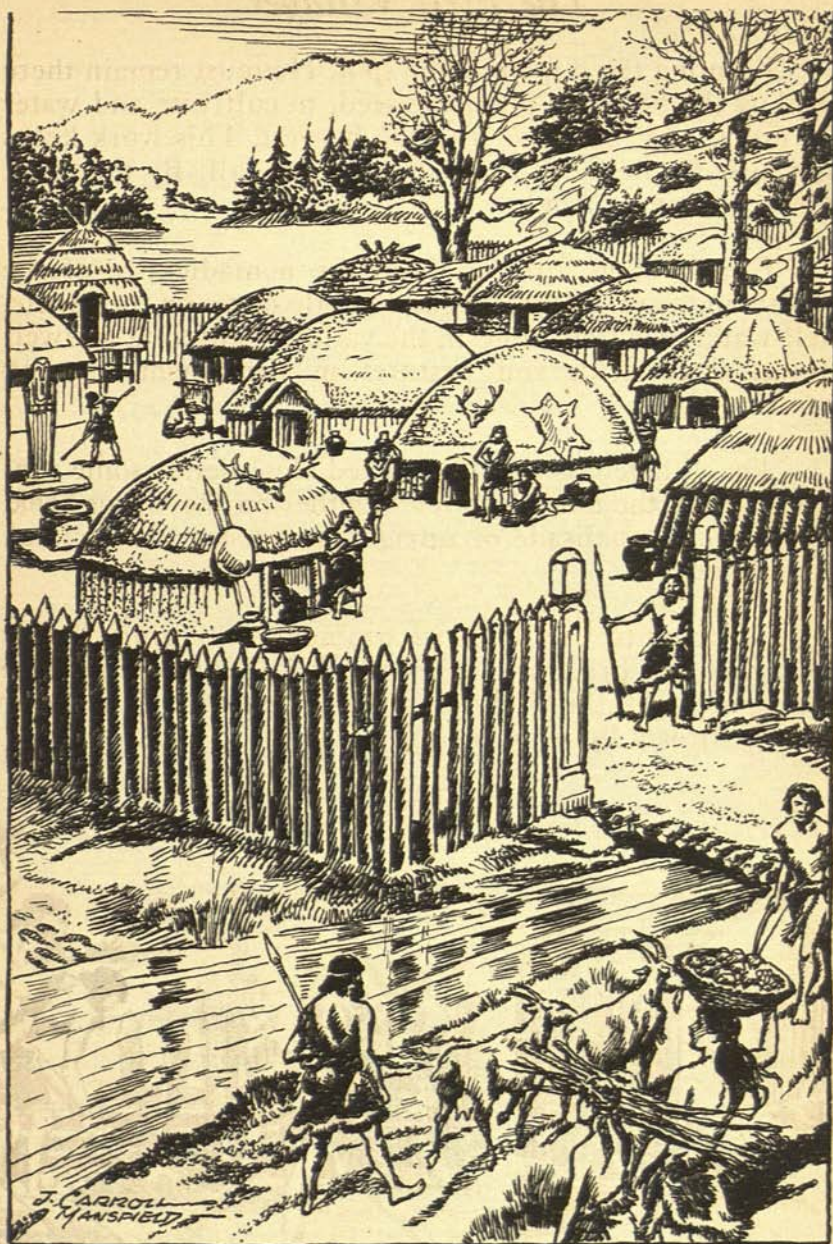
Family clans, turning from the nomadic life of the herdsman to agriculture, began to settle down on the fertile, well-watered bottom lands in the valleys, gathering to dwell amidst their fields and pastures in permanent farming hamlets.

The village was usually pitched close beside some running stream, the huts clustered together on the rising bank. An encircling palisade of upright, pointed posts enclosed the village.

Community life, with its problems and projects that concerned all, brought closer contact and interdependence among men. All the villagers united to erect the palisade or dam the stream for watering the fields.

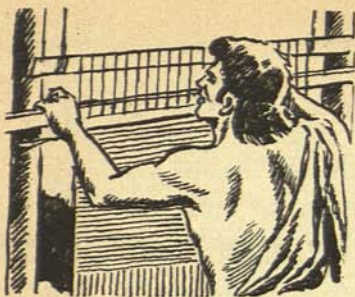






*Restoration of a prehistoric farming village in  
Western Europe*





## *The First Artisans*

Community life was so utterly different from the old independent, nomadic existence to which the wandering herdsman had so long been accustomed that it was difficult for some men to adjust themselves to the change.



But village life had many advantages. For one thing, the hunter and herdsman had been obliged to be a jack of all trades and supply all his own wants. But now the first specialists, the first artisans, were going into business. The man that made the best tools and weapons began to devote all his time and skill to that work and became the village armorer, the forerunner of the village blacksmith. The best potter and the best weaver likewise established their trades. Now the farmer could give all his time to cultivating his crops. If he wanted a woven robe, a large earthenware jar, or a polished stone pick, he could get them from the men that made them best in exchange for some of his grain or vegetables.

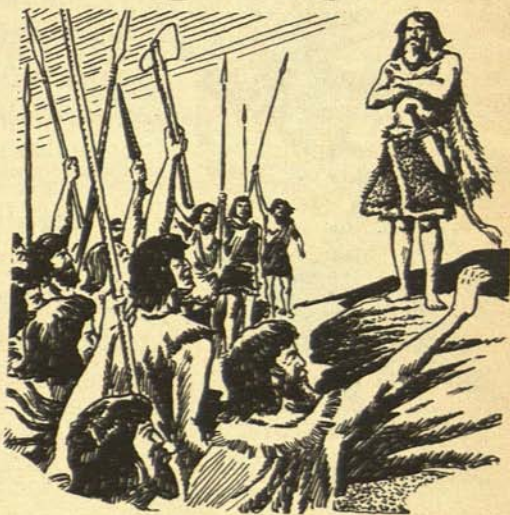


## *The First Laws*

A large number of people could not live together in peace and harmony without rules concerning the conduct, rights and responsibilities of the individual for the good of the whole community. Such rules, were made by the wisest and most experienced men of the village, older men whose judgment was respected and who became an official council of elders. This was the first "senate," a term later derived from the Latin "senex," meaning "elder" or "old man."

To meet the need for leadership the council of elders chose some stalwart, energetic man to be the tribal headman or chief. Perhaps several men were suggested for the post and the village rang with the first political debates.

The man chosen to direct the community projects and command the warriors in case of attack had to make good, or he was liable to be promptly deposed by the voice of the people.



## Signs and Omens

The witch-doctor, or medicine man, was an important member of the council of elders. No undertaking was begun until he had consulted the "signs" to see if the outlook was favorable. To this day among the Alaskan Eskimos the tribal sorcerer, the Angutkok, wields similar power.

The prehistoric witch-doctor was a specialist in omens. He studied the entrails of fowls or watched the flight of birds. At times even the neighing of a horse was believed to have some portent.

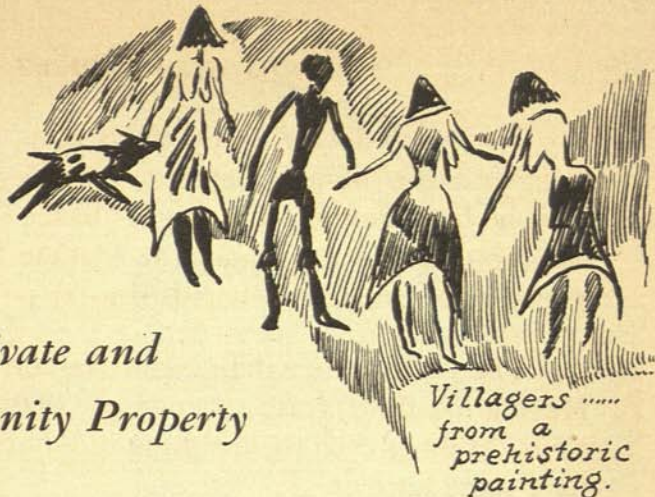
If his judgments accidentally proved correct, the witch-doctor became renowned for miles around. However, the shrewd oracle usually protected his reputation by issu-

ing vague predictions with so many different meanings that they seemed accurate no matter what happened.

On such occasions a sacrifice in the form of a goat or a sheep was offered to the gods, and wound up in the oracle's larder.







## *Private and Community Property*

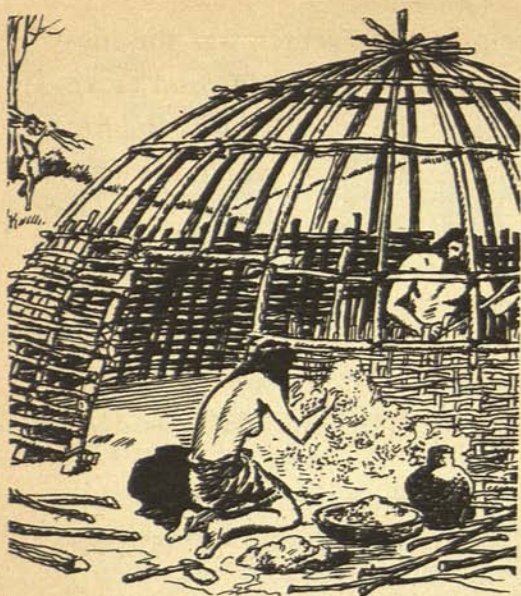
*Villagers .....  
from a  
prehistoric  
painting.*

The gathering of a large number of people in villages brought up the question of property rights and ownership; what belonged to the individual and what to the tribe at large. A few surprisingly sensible rules were agreed upon and became tribal law.

The weapons, tools and utensils that a man made for himself were regarded as his personal property. The hut that he and his sons built belonged to the family. A tribesman could own enough cattle, sheep and goats to take care of the wants of his family, but all surplus animals went to form community herds in which all the tribesmen had an interest.

If several men united in a hunt, the game they killed was equally shared by all, though the actual killer might claim some of the choicest parts.

The fields that surrounded the village belonged to the tribe and the harvest was stored in the public granaries to be shared by all. The tribe also laid claim to certain hunting grounds, which were open to all members of the tribe, providing they killed no more game than they needed.



## *The First Permanent Houses*

Ten thousand years ago, all over Europe, in Western Asia and in North Africa Neolithic farmers were erecting dwellings of much the same type. Most of them resembled inverted bowls or the igloos of the Eskimos.

In sparsely-wooded Egypt and Mesopotamia "bee-hive" houses were built of mud or sun-dried brick, "adobe."

In Western Europe, where timber was plentiful, a circle of stout saplings was planted in the ground, and their tops bent down and fastened in the center to form a framework that looked like a bird cage. This was covered with a wicker-work of pliant twigs. Then the circular sidewall and domed roof was plastered on the outside with clay, which gave a fairly weather-tight finish and a measure of protection against fire. Often the hut was erected over a pit about three feet deep.

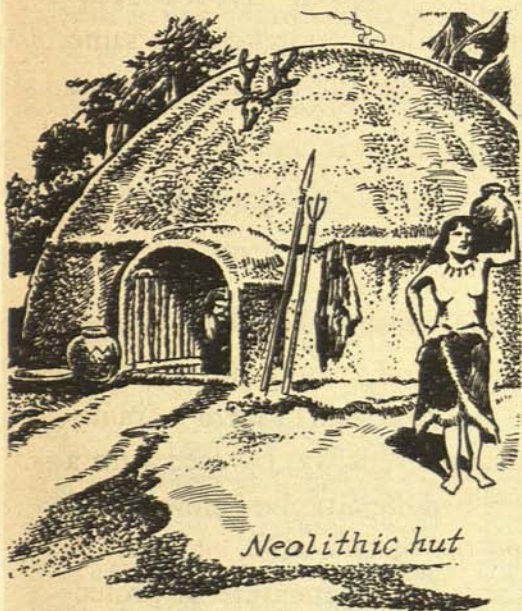


The large circular fire-pit in the center was the most conspicuous feature of the hut, the smoke rising and escaping through a hole in the peak of the roof. Around the fire-pit were spread the skins or piles of furs on which the occupants sat or slept.

Hung on the wall or stacked against it was all the paraphernalia of the hunter-farmer; spears and javelins, bows and quivers of arrows, implements of stone, wood and bone, baskets and pottery. Trophies of the chase served as decoration.

The explorers Lewis and Clark, going up the Missouri on their historic journey to the Pacific Coast, 1804-1806,

found the Mandan Indians dwelling in such "round houses." Pit houses of this type are still common in many parts of Russia, and the shape clings in the felt-covered "vurts" of the Kurghiz nomads of the central Asiatic steppes.



## *The First Wars*

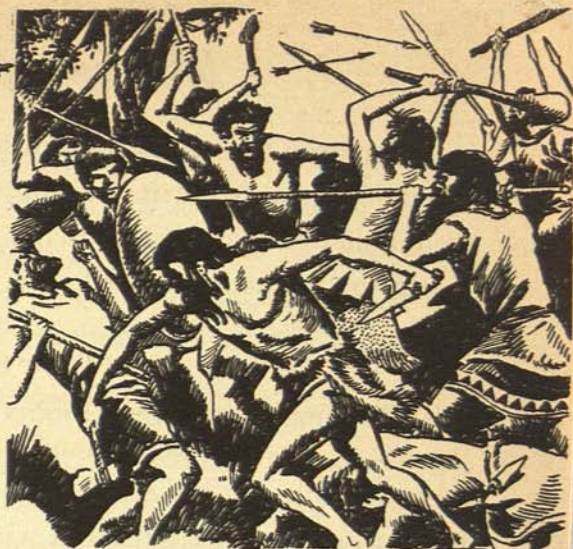
Community life drew Neolithic people together in co-operating groups but it did not assure harmony and unity among men. Rivalries eventually bred and loosed upon the world the tragic scourge of war.

Bitter disputes arose between tribes and neighboring villages over such things as the water rights of a stream or the use of certain pasture lands or hunting grounds. If the quarrel could not be settled to the satisfaction of both sides there were bloody conflicts in which for the first time large numbers of men were arrayed against each other.

While many men were flocking to live in the flourishing farming towns, others preferred to cling to the independent life of roving hunters and herdsmen. A bitter enmity took root between the nomad and the villager, between the "wild men" and the "civilized," each feeling a deep contempt for the other.







A battle in prehistoric times was just a big brawl. There was little strategy and no intricate maneuvering. The opposing forces formed two ragged lines, and advanced to the attack, brandishing their weapons and chanting their tribal war song.

Volley of arrows were exchanged. These were followed at closer range by a shower of spears and javelins. Then both sides rushed in to close quarters, and the lines broke up into savage hand-to-hand duels, the combatants swinging stone maces and war hatchets and hacking at each other with flint knives. It seemed almost impossible for anyone to come out of such a haphazard melee with a whole skin.

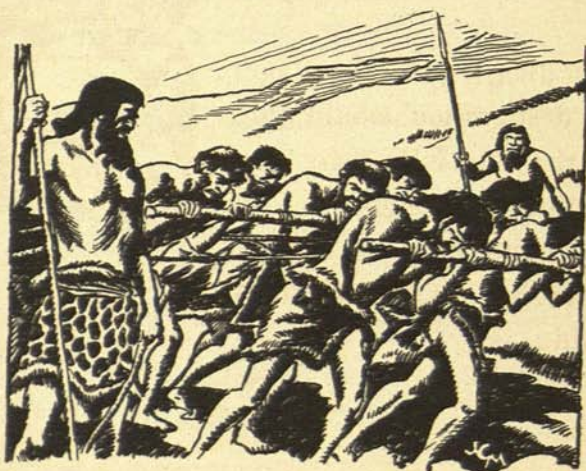
In most cases everything was staked upon one decisive battle, the outcome of which settled the war one way or the other.

## *Human Bondage*

The farming towns were always in danger of sudden attack, particularly after harvest time when the granaries were full. If the barbarous nomads overwhelmed the villagers in a lightning raid, they sacked and burned the town and returned to the hills with much booty and many captives.

The more cunning robber chieftains preferred to spare a hamlet and most of its inhabitants, so that it would remain a prey for future harvest-time raids. Out of this warfare arose the cruel practice of human bondage.

Formerly prisoners of war had been put to death, but now the victors found it far more profitable to spare the lives of their captives and sell them into perpetual slavery. In time bands of lawless herdsmen gave up raising sheep and goats and became slavers and outlaws.





The townsmen went to great pains to make their towns safe against raids and erected strong fortifications of thick, pointed logs, resembling those of American frontier stockades of a century and a half ago.



Sometimes the elders might turn to the captain of a band of warlike nomads and hire him and his men to protect their town as mercenary soldiers. All too often this turned out to be a fatal error, for once inside the walls the barbarians proceeded to take possession of the place, enslaved the population, and their captain set himself up as a king.



Once in awhile several villages, driven to desperation, would unite and take the field with their combined fighting strength to run down and wipe out some band of outlaws that had long been a thorn in their side.





## *The Conquest of Water*

Neolithic men conquered another element, water, a conquest that began when man, probably by accident, discovered the knack of swimming.

Then one day a swimmer, becoming exhausted, grasped at a floating tree trunk, and found to his surprise and relief that it would bear his weight in the water. From the floating log came the idea of the raft, simple and easy to build wherever there was timber. Man now had a means of crossing broad, deep rivers that had barred his way. Though clumsy, difficult to steer and hard to push against the current, the raft was for many centuries the only mode of travel over water.





## *From Bowl to Boat*

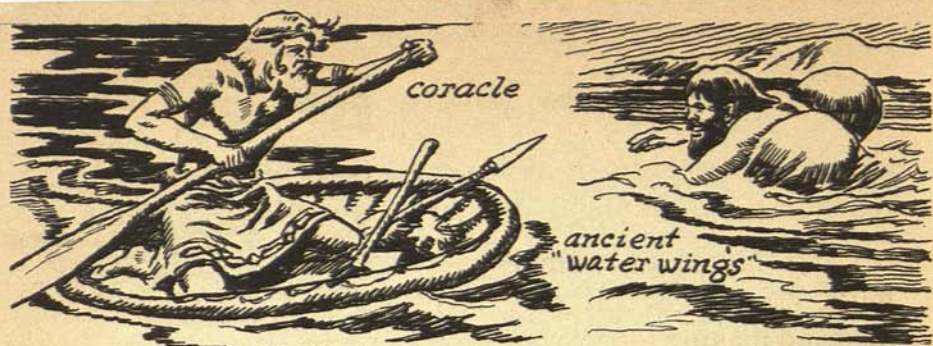
One day a woman was scouring the family pottery with sand on the bank of the Euphrates River in Mesopotamia. A bowl slipped into the river. The woman was surprised to see it floating buoyantly on the surface of the water.

Just then her husband chanced to come along and retrieved the bowl for his wife. He also got an idea. That night, sitting beside the fire, he thought long and hard about the floating bowl. The very next day he set to work fashioning a stout framework of pliant saplings that resembled a large bowl.

When this was finished, the man covered the frame with a basket-work of tough reeds, and coated the over-size bowl, inside and out, with pitch that he got from the odorous lake of asphalt in the vicinity. After allowing the pitch to harden, the man rolled the great bowl down to the river-bank and launched it in the water. To his satisfaction he found that the bowl not only floated lightly on the water, but





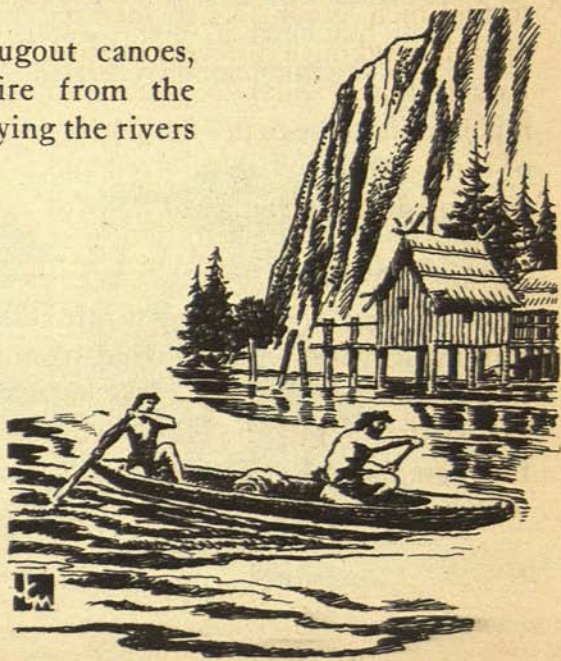


would carry himself, his wife and small son and the family dog.

The man's neighbors were delighted with his invention, and soon bowl-boats were common on the Euphrates. They still are. This was the beginning of boats with hulls. Boats are still called "vessels," the name that has always been applied to bowls and pots.

Much later the coracle, that looked like a big saucer covered with hides, was commonly used in the British Isles.

By 7,000 B.C. dugout canoes, hollowed out with fire from the trunks of trees, were plying the rivers of Europe.





Later larger war canoes were built, capable of carrying many men and making long voyages over large bodies of water. Oars were invented, and these propelled the larger boats at greater speed than the shorter paddles. In time large galleys, high at prow and stern, were constructed, with space to hold a large cargo.

On some of these long voyages the adventurous boatmen reached distant lands, and were surprised to find men, much like themselves though speaking a different tongue, living there. Such contacts did much to increase man's knowledge of the world in which he lived and promoted the exchange of helpful ideas.



One day a man poling a raft across a lake made an important discovery. The wind, coming from behind him, filled out the folds of the cloak he was wearing and blew the raft swiftly across the lake. Impressed by this experience, the man made the first square sail and tried it out on a mast with great success. So the first sailboats came into use.



## *Man and the Machine*

Living in a complex machine age, we moderns are accustomed to taking for granted all the mechanical miracles that serve us in a thousand ways every day. We seldom pause to reflect upon the superiority of the mechanical giant over the puny strength of man.

When the cave man had to move a log or a rock, his performance of the task was limited by the degree of physical strength he possessed. If the log or the rock was too heavy for him to handle alone, he was obliged to call upon another man to help him. This dependence on aid from others helped promote cooperation among men, whether they liked each other or not.

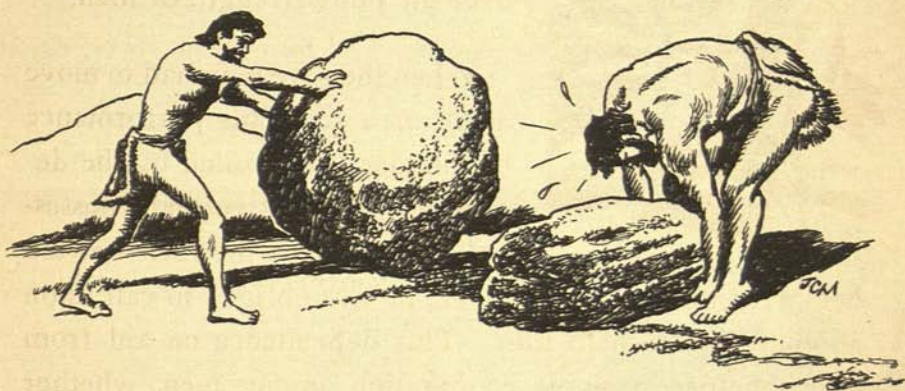
Man found, without being able to find a reason for it, that it was much easier to walk downhill than uphill. He wondered why he saw his face reflected in the water, when




he bent over to drink from a stream. He never dreamed of the law of gravitation, yet he knew from experience that objects thrown into the air always fell back to earth.

He became familiar with a number of forms of natural energy, like the force of the wind and falling water, without knowing at the time how to harness them to serve him. He noticed the springiness of saplings, when they were bent, and employed this force in the bow and arrow.


He learned that a round stone would roll downhill; that he could throw a small flat stone so that it would skim over the surface of a pond. He wondered why a large round boulder could be rolled easily, while a much smaller square stone was hard to move.





## *The Lever and Fulcrum*

At last man learned to extend his own strength by applying certain natural laws.



Even in prehistoric times children played "see-saw" by balancing a log over a rock. From this simple game came the important idea of the lever and fulcrum, one of the first great mechanical aids. With the aid of a lever, man found that he could move logs and rocks that he could never budge by muscle alone. The longer the lever, the more power it could exert. This discovery was put to work in a number of primitive machines, like the one for raising water to irrigate a field. Also from the see-saw came the balance scale for weighing.





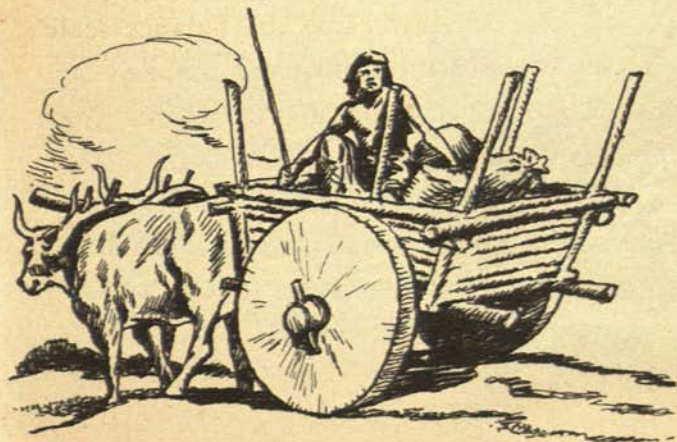
## *Inclined Plane, Roller and Wheel*

Two more outstanding discoveries were the inclined plane and the roller. The first works on the principle that it takes far less effort to walk up an ascending ramp than it takes to climb a flight of steps. The inclined plane also provides a flat surface for the use of rollers.



The roller itself came from man's discovery that a round stone was easily movable, while a square stone was not. Rollers, when placed under a square stone, made it as easy to move as a round one.

Later, the principle of the roller was developed into the wheel, a milestone in transportation and industry. Soon men began to build crude ox carts and chariots. Without the invention of the wheel our modern machine age could never have come to pass.





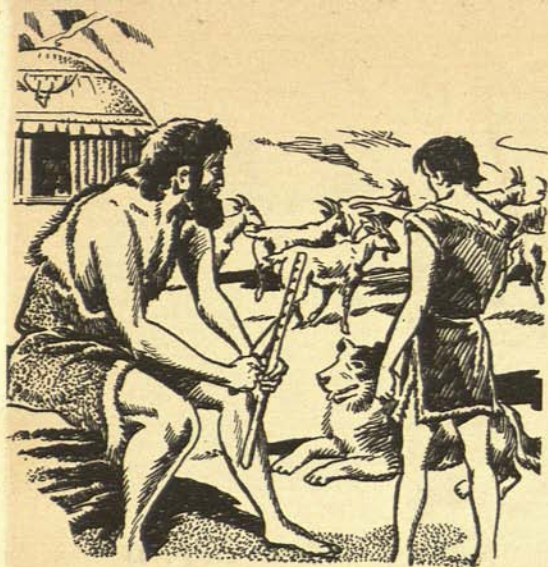
### *Man Begins to Tell Time*

Neolithic man was learning many things that would have been too much for his ancestors. For one thing, he had learned to reckon time in a rough, inexact sort of way.

All that the first men knew of time was that night followed day, and that the cycle of seasons — spring, summer, autumn and winter — was to be expected.

Neolithic man knew very little about the sun, but he had noted its regular progress, as well as that of the shadows it cast on the ground. It was these moving shadows that gave man something with which to measure time. Using an upright boulder and a half-circle of stones for the first sun dial, he may have said to a comrade, "Wait here. I shall return when the shadow points to the third stone."





Observant men were becoming acquainted with many simple facts that were to form the foundations of what we call the exact sciences.

For instance, mathematics may be traced back to a herdsman keeping track of the number of his goats by cutting a notch for each animal on a tally stick. This method of counting led later to the invention of the abacus, the counting-frame of the ancient world, still able to hold its own against modern calculating machines.

Man was taking a keener interest in the stars and ever making new discoveries as he scanned them. Shepherds, watching their flocks by night and noting the fixed positions of certain stars and constellations, began to use them as beacons to guide their way.

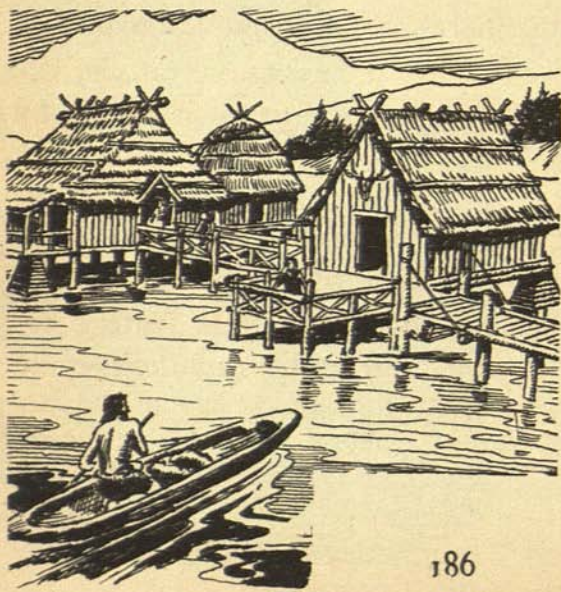


*How a Swiss  
Mystery Revealed  
the Past*



In the year 1854 a winter of exceptional mildness and dryness caused the waters of the lakes of Switzerland to sink to their lowest level in history, exposing in a number of places curious clusters of charred posts never seen before in the memory of man.

Archaeologists hurried to the scene and found them to be the supporting posts of prehistoric tribal villages that

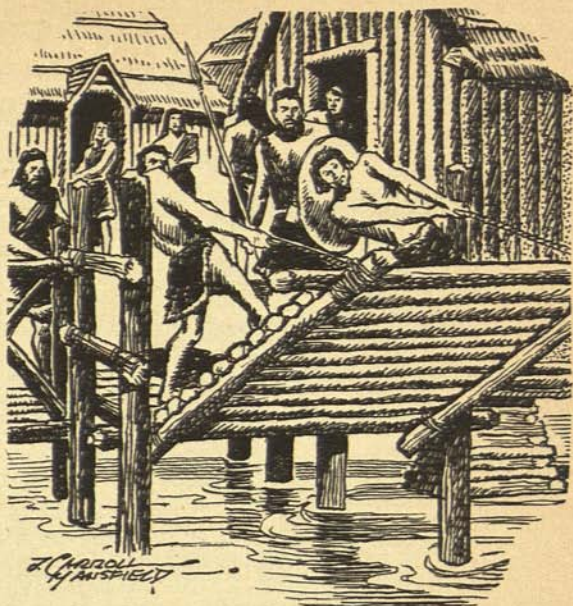


perhaps nine thousand years before, had stood on wooden piles above the waters of the lakes. Fire had burned these ancient villages to the water's edge, reducing the posts to charcoal, and thus prevented them from



rotting during the long centuries they had been submerged.

These Neolithic lake-dweller villages had enjoyed defensive and sanitary advantages, but the thatched-roof huts were a constant fire hazard.



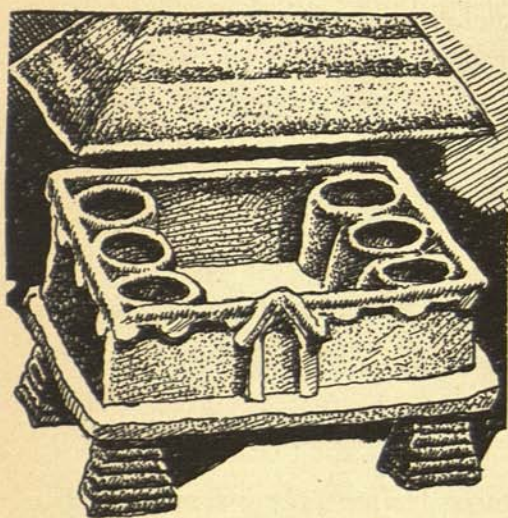
At close of day the men and boys returned from the hunt or pasturing their domestic animals ashore; the women and girls from work in the fields. The cows, sheep and goats were driven in, a section of the sturdy plankway connecting the lake village with the shore was raised like a drawbridge, a sentinel was posted and, after the evening meal, the villagers settled down to slumber, secure from attack by enemies.

Raking and digging in the mud beneath the ruins brought to light a treasure trove of prehistoric objects: stone and bone implements and earthenware pottery, together with many other artifacts that shed new light on the typical, everyday life of Neolithic men in the Europe of that bygone day.

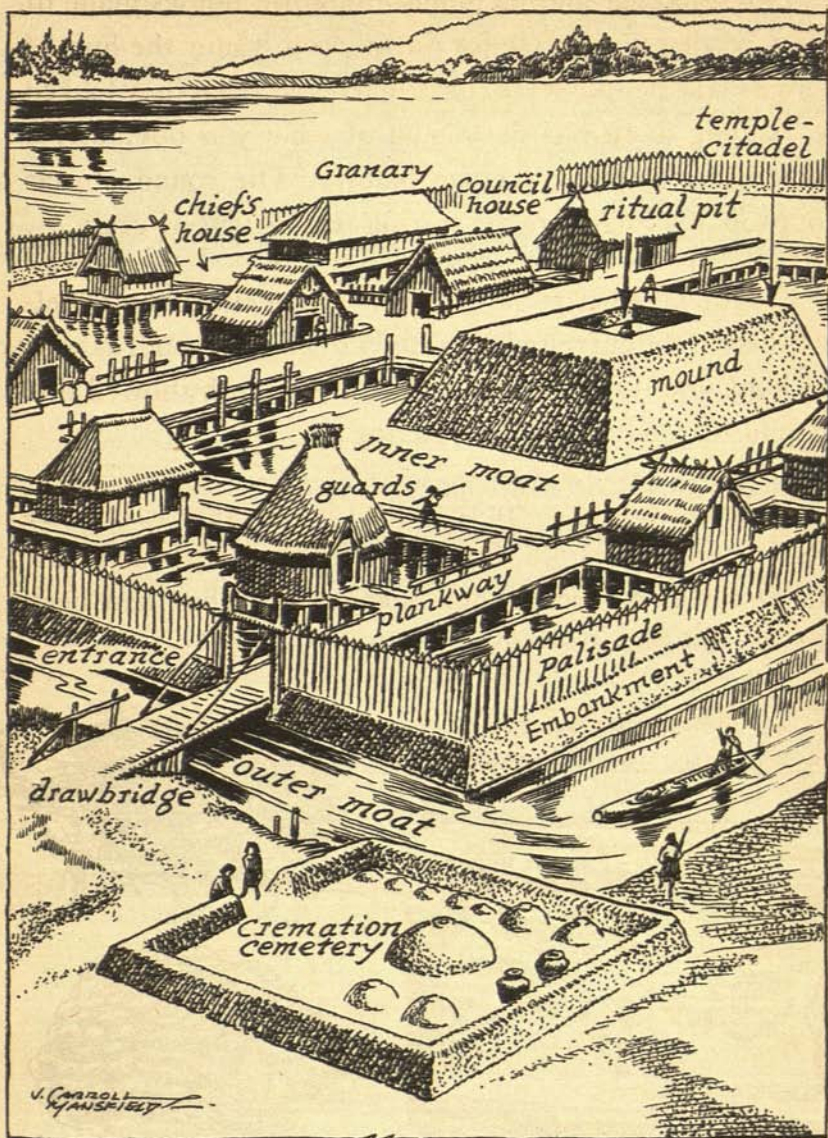
This amazing find included miniature houses made of pottery, so that we can see for ourselves just how the huts of the Swiss lake people were constructed and what they looked like. Among them was the model of what was obviously a storehouse or granary (shown below). The round objects were probably huge jars for storing the harvest of grain.

Fragments of nets gave evidence that the Lake Dwellers fished in the surrounding waters by that method, as well as by hook and line, and pieces of charred cloth showed that they had learned the art of weaving.

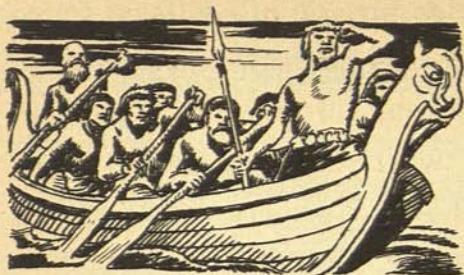
Most interesting were the burnt breadcakes with seeds in them, 9,000 years old, found among the debris, and still bearing marks on the bottom showing that they had been baked on hot stones.







*Restoration of a prehistoric Italian lake village*



During the next thousand years villages built on piles became more common in certain parts of Europe, for the ruins of many of them have been unearthed. The builders must have lived in ever-present danger of attack, for even the smallest hamlet was elaborately fortified. Religious ritual played a great part in their daily lives, because sacrificial mounds, ritual pits and cemeteries were conspicuous features of the village.

It is believed that villages of this type were introduced into Europe by broadheaded newcomers from far to the East, perhaps from the same regions as the broad-headed wanderers of Solutrean times. They may have been roving Aryans from the distant shores of the Caspian.

They brought with them the practice of cremating their dead and burying the ashes in funeral urns, a form of burial hitherto unknown in Western Europe but common in Asiatic countries.



From the ruins of the prehistoric pile-villages found so far, the route of these mysterious newcomers through Europe can be traced. They came northward and westward up the Danube to the Alps, where they split, some turning south through Switzerland into Northern Italy, settling around Lake Garda. Others went down the Rhine and built their pile-villages on the low seaboard lands of Belgium and Northern France. A few even crossed over to Britain.

The pile-village enabled men to build habitations in low, marshy regions that otherwise would have been uninhabitable. Their builders, whoever they were, became so accustomed to their pattern of construction, that they sometimes even built pile-villages on high, dry land, where such a type of architecture was unnecessary. Examples of this are the *terremare* villages of Northern Italy.



## *The Riddle of the Azilians*

From time to time other bands of immigrants from afar filtered into Europe and settled down. Little is known of any of them but all left some distinctive relic of themselves, some peculiar mark of their former culture or way of life. All of these late arrivals were in time absorbed or lost among the already established peoples of Europe.

Toward the close of the Neolithic age, a strange, new group drifted in, presumably from North Africa. They are termed Azilians, because traces of their culture first came to light in the Cave of Mas d'Azil in Southern France.

The Azilians left behind them quantities of curious painted pebbles, the purpose of which has never been discovered. Were they counters in some popular game, a prehistoric form of money, or an early attempt at writing?

MYSTERIOUS  
PAINTED PEBBLES  
FROM THE CAVE  
OF MAS D'AZIL.





## *Kitchen Middens*



The effects of the last glacial age were finally disappearing in Western Europe. Broad steppe lands were now covered with great, spreading forests of pine and fir trees. As the climate moderated, the evergreen forests spread northward across the Baltic States, into Scandinavia and Russia.

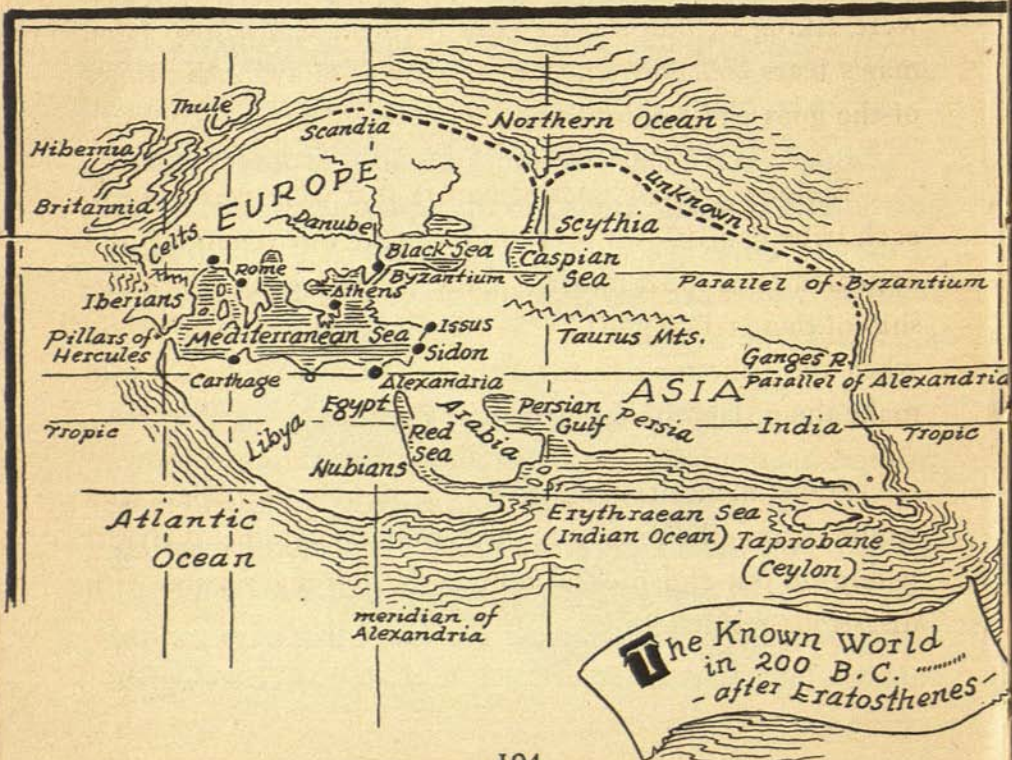
Many descendants of the Palaeolithic Cro-Magnon and Solutrean men, clinging to the adventurous, roving life of the old stone age hunter, had followed the dwindling herds of reindeer as they retreated slowly northward toward the sub-Arctic snows.

When at last the reindeer had vanished from Western Europe, bands of these former hunters settled on the shores of the North Sea and the Baltic and wrested their food from the sea. Over the long centuries they piled up the towering heaps of shells and rubbish known as "kitchen middens," along the coasts of Holland and Denmark, that have yielded valuable information and artifacts to modern archaeologists.

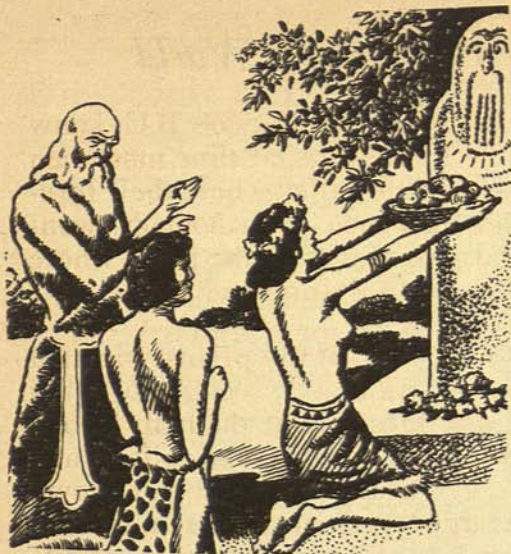
## Prehistoric Knowledge of the World

How much did a prehistoric man of 5,000 B.C. know about the world in which he lived? At that time most men lived all their lives in the same little valley where their forefathers had lived and died. Few men, even nomads, wandered more than a few hundred miles from the place where they were born. There were yet no writing and books.

Therefore, we cannot be sure what the prehistoric man knew about the world, but we can be very certain of what he didn't know about it. Look carefully at the map below. It was the work of Eratosthenes, one of the most enlightened men of his day, in 200 B.C., and contains all that was known of the world at that time. If this represented the sum total of geographical knowledge in Eratosthenes' day, then primitive men, 4800 years earlier, knew little indeed.







## *Nature Worship and Tribal Gods*

By this time pagan religions based on nature worship were taking definite form. Most of them had grown from man's fears and their chief purpose was to avoid the anger of the gods and head off bad luck.

Beside the many gods of nature that were worshipped, each tribe had its own special deity that was venerated and appealed to as the guardian of the tribal destiny. The worship of these tribal gods brewed lots of trouble, particularly when the tribesmen firmly believed that their god would make them triumphant over their enemies.

Sometimes, drugged with the notion that their god would bring them victory and rich booty, the warriors would go out and pick a fight with a stronger tribe with disastrous results.



## *Tabus*

Tabus, the traditional "must nots" of primitive men, had become so numerous that elders of the tribe were appointed to see that they were enforced and to conduct the tribal rituals. These were the first pagan priests.

It is difficult for moderns to understand the ancient tabu system, yet it stamped itself so strongly upon the minds of prehistoric men that some of its effects are still felt. Many of those ancient tabus have come down to us in the form of common superstitions such as: "It's unlucky to spill salt" and "Don't let a black cat cross your path."

Tabus were both primitive man's laws and religion. It was because of their religious nature that tabus were stronger than laws alone. Any breaking of tabus was punishable by death, for it was feared that such acts would bring disaster upon the whole tribe.

Many objects were regarded as untouchable; some because they were "sacred," others because they were "unclean."



Examining these old tabus, we find that some of them are really wise teachings, but so disguised as to be scarcely recognizable as such. What was the purpose of this verbal camouflage?

The old pagan priests who originated the tabus knew the contrariness of human nature. They shrewdly put the tabus in a form that would be sure to command obedience. They knew that a wild hunter, boasting of his independence, would recklessly flout any man-made law just to prove that he did as he pleased. But they also knew that the bold hunter was scared to death of bad luck and the anger of the gods. So they let the fear of evil consequences support rules of behavior. Of course this lent the same strength to many bad and foolish notions.



## *Sun Worship*

In the Neolithic age peoples in many widely separated parts of the world came to worship one god above all others. In most cases it was the sun, which was regarded as the giver of all life. In Western Europe the sun worshippers left behind them the strange, upright monolithic monuments known as "menhirs."

Stonehenge, the famous cromlech, or stone circle, on Salisbury Plain in England, is believed to have been the scene of stone age pagan sacrifices to the sun god.

The mile-long rows of stones still standing at Carnac in Brittany give further proof that Neolithic men worshipped the sun, for the rows are so arranged that exactly at the time of the summer solstice, June 21, the rays of the rising sun shine straight down the lines.





## *The Druids....*

### *Human Sacrifice*

Among the Celtic peoples of Britain, Ireland and Gaul the strange cult of Druids sprang up. They were priests and magicians dealing in the mysterious powers of animals and plants. They performed their mystic rites in oak groves, the oak tree being sacred to them, especially if mistletoe grew on it. They were also the tribal judges, wielding the power of life and death.

The Druids made human sacrifices to the gods, as all primitive people did at some stage in their development. It was believed then that the gods must be presented with precious gifts. What could be more precious than human life itself?

Even in historic times human blood has flowed from sacrificial altars. Ancient legend and even the Scriptures contain familiar instances.



*Druid  
Priest.*

*sacrificial knife  
(Aztec)*





Many prehistoric tribes associated the planting of seeds and the sprouting of crops with death and resurrection. Every spring at seed-time the tribesmen gathered to watch the priests sacrifice upon the great altar stone an honored youth, the flower of tribal manhood, a willing and heroic martyr who died that the Sun God might smile upon the fields and make the harvest abundant.

This blood was shed so uselessly and senselessly, not through cruelty, for the best-beloved of the tribe were sacrificed, but through blind ignorance and superstition. Some tribes believed, as did the Aztecs in Mexico, that the gods themselves could only be kept alive by human blood.

Later, men in Europe, in Egypt and elsewhere performed the same old ceremonies without the demand for blood. Today we break a bottle of champagne over the bow of a new ship to bring good luck to the vessel. Few realize that the wine was substituted in ancient times for the blood of a human sacrifice once sprinkled on a vessel as she left the ways, in the hope that the God of the Sea might be satisfied with the life of one man and spare those of the ship's crew.

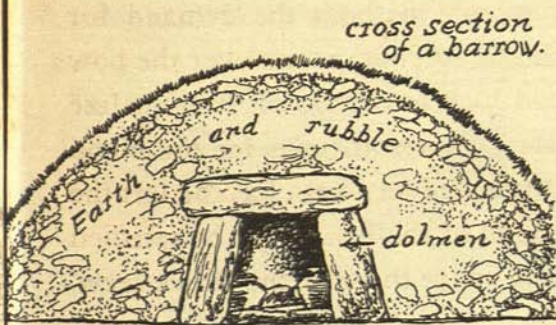


## *Dolmens and Barrows*

The sun worshippers and the Druids left other curious relics of their way of life. Still standing in country districts in Brittany and England are strange, weatherbeaten monuments called "dolmens," made of massive stone slabs, that look something like tables. For a long time it was thought they were prehistoric altars.

But digging into odd, round mounds of earth in the vicinity disclosed the real purpose of the dolmens. They were the stone linings or casings of ancient tombs inside burial mounds.

After the stone dolmen had been erected, a huge mound of earth and rubble, in England called a "barrow," was piled above and around it, so that it became a subterranean vault or crypt. These tombs were first used as community burial places, where the deceased members of the tribe were laid to rest with elaborate ceremonies.



## *Tribal Tribunals*

Tribal tribunals dealt with the problems of crime and punishment. Neolithic justice was of the "eye for an eye, and a tooth for a tooth" variety. Since there were no jails in those days, there could be no imprisonment, but flogging, maiming or execution, banishment and property fines were common penalties, depending on the nature of the crime.

Tribal law was tangled up with superstition, "magic," and religion. Prehistoric judges tried to determine guilt or innocence by strange and painful ordeals, such as plunging the hand of the accused into a pot of boiling water, or making him hold a red-hot stone. Unless by some miracle, the accused, by these tests, was always "guilty."

Every spring, to cleanse the tribe of its sins, all blame was heaped upon a "scapegoat," which was then driven away from the village.







## *Trade and Currency*

Now that men had surplus products to dispose of, trade and commerce were brisk and flourishing, not only among neighboring tribes, but with distant parts as well. Every town now had its broad, open marketplace, pungent with aromatic smells and resounding with sounds and voices, the bleating of sheep and goats and the lowing of cattle, the shrill bargaining of women shoppers, the cries of hawkers and haggling merchants and whining beggars..

Trade brought many strangers into town, and led to the opening of the first inns to provide food and lodging for the visitors and their pack animals.

Cattle had become the first "money." Our word for money matters, "pecuniary," comes from the Latin "pecunia," meaning "cattle." From "cattle" the word "chattel," or "property," originated. The word "money" itself comes from the Latin "moneta," a mint.

## *The Lighter Side of Life*

Neolithic life also had its lighter side. People have always liked to be amused; and those who furnished entertainment for the tribe were the buffoons, the bards and the minstrels.



Singing began at a very early date, when man learned to control the tones of his voice. Some say it sprang from yodelling, calling musically from one mountain top to another. Neolithic mothers crooned lullabies to their drowsy babies, and the warriors roared wild war chants.

By this time men had learned to brew beer and mead, and make wine from grapes. Before yeast came into use, fermentation of the "mash" was begun with human saliva, just as the Polynesians still do in the preparation of "kava." To make this seem less offensive, the most beautiful maidens with the finest teeth chewed some of the mash, and spat it back into the bowl.



## *The First Musical Instruments*

Neolithic men must have been very fond of music, for they invented many kinds of musical instruments. Of course there were drums, always prized by primitive men. They ranged in size from small "tom-toms" to great hollow logs.

Whistles, pipes and flageolets have been found in Neolithic ruins. With such instruments the shepherd boy serenaded his girl. People living on the seashore blew on large conch shells. Others used ramshorns as trumpets, like the ancient "shofar" used in Hebrew ceremonies.

On the eve of the historic era other musical instruments had come into use. The first stringed instruments, the lyre and the harp, were suggested by the twang of the taut bow-string.

It is a great pity that no prehistoric musical composition has been preserved. Songs of that day lived on for a time by mothers teaching them to their children, but eventually these early melodies were forgotten. The well-known way of writing musical scores was not invented until the Middle Ages.



## *Early Mechanical Devices*

Among the more advanced peoples, in Egypt and Chaldaea, man's inventive genius had added many new devices to the growing list of basic mechanical appliances. Men had learned to weave stout ropes of plant fibers, and these were used for moving or lifting great weights with the aid of such contrivances as the pulley and the windlass. Crude cranes, other descendants of the "see-saw," were coming into use.

Large round millstones, turned by men, asses or oxen, were replacing the primitive pestle and mortar for grinding flour; and grindstones were used for putting a keen edge on cutting tools.

Before the use of metals, doors were swung on broad leather straps which served as hinges, and methods of bolting and barring doors had been invented. Water was carried through the first pipes made of hollow logs. Later pipes were made of lead, the Latin word for that metal being "plumbum," which led to piping being called plumbing.





## *Growth of City-States*

The thousand years that followed the beginning of agriculture brought great changes particularly in the countries of the Near East. There by 5,000 B.C. towns had grown from a cluster of mud huts to populous cities. Some of them were now powerful city-states, controlling the surrounding territory for many miles.

The village chieftain was now a king. The old Council of Elders had vanished, and the only thing that resembled it was a cabinet of priests and nobles that was supposed to advise the ruler. Some cities in Chaldea were ruled by High Priests in the name of the gods.

Within the massive walls of the city were the marketplace, palaces and temples, in the midst of the hodge-podge of homes of the citizens, who already lived in a congestion that the old cavedweller had never known.





## *Neolithic Marriage*

In Neolithic times marriage had become a sacred, religious ceremony although the ritual contained many mock incidents of the brutal Old Stone Age abduction. Some of these features have survived as nuptial customs through the centuries.

The Old Stone Age "best man" was the stalwart friend taken along to fight off the girl's menfolk, while the groom stole his bride. The bridesmaids represent the maiden's friends who once actually fought to rescue the bride from her abductor.

The tossing of the bride's bouquet is thought to symbolize the flowers, leaves and twigs dropped by the stolen bride to mark the trail so that her relatives could track down the kidnapper.

The act of abduction itself is still unconsciously reenacted when the modern groom carries his bride across the threshold of their new home. The prehistoric prototype of the wedding cake, as well as the throwing of rice, was the small seed-cake, symbol of fertility, which was broken above the bride's head that she might be blessed with many children.





## MAN DISCOVERS METALS

One eventful night some five thousand years before the Birth of Christ a small party of Chaldean villagers, hunting in the hills beyond

the Tigris River, having been overtaken by darkness, pitched camp for the night. They kindled a roaring fire among the rocks to keep warm.

One of the hunters, huddled beside the fire, beheld a strange thing. What looked like fiery little beads were trickling out of a crumbly rock and dripping down into a small hollow in the ground to form a glowing little puddle. The hunter called the attention of his companions to this strange sight, and together they watched to see what would happen. They saw the fiery glow fade from the little puddle, but for a long time it remained too hot to touch.

Poking at it with their knives, the hunters discovered that the fiery beads had run together and hardened into a piece of some shiny, reddish brown substance the size of a small stone. When this object had cooled sufficiently to be handled, it was passed around and carefully examined. Thus man first became acquainted with copper.

## *The Rise of Kings*

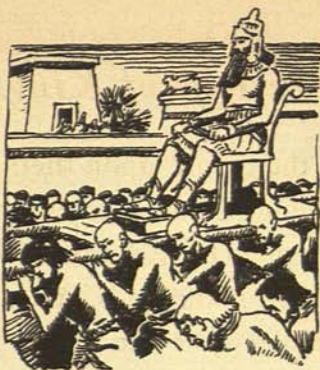
To strengthen their hold upon their thrones the kings, not satisfied with having soldiers to enforce their will, connived with high priests to have themselves proclaimed gods, or at least descendants of the gods. As such, the ruler must be obeyed by his subjects, or the wrath of the gods would descend upon them and smite them.

Thus the notion of the divine right of kings was foisted upon gullible men, an idea that persisted in Japan until 1945.

The city-state, now a kingdom, completely submerged the once-free hunter, who now became a subject.







These changes had been brewing a long time. The hunter, shepherd or farmer, who once had boasted of his independence had become so accustomed to being conscripted for labor on public works and taking orders from the man directing the job, that long ago he had ceased to bother about public affairs, except as a topic of idle gossip, and found it easier to leave such matters to those "higher up."

He found himself no longer a free agent with a will of his own, but just one of thousands of other men, exploited and often oppressed, forced to toil from dawn to dusk at whatever task was put upon him, and compelled through poverty to live in a wretched, crowded slum of the city, or in a hut on its outskirts.

The love of liberty, a faint spark, continued to burn in his breast, but that spark was doomed to smolder in the breasts of other common men for thousands of years until it finally blazed up in the fires of republicanism and democracy.



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Digging in the fire, the hunters found other puddles of molten metal, and discovered that this strange substance, when in a soft state, could be bent or flattened by a blow from a stone hatchet.

Here was a substance that could be melted, molded or hammered, while still soft, into any shape, yet, after it cooled and hardened, became harder than stone. What arrowheads, what knives and other tools it would make! The excited Chaldeans rushed home with the news of their amazing discovery. A new age, an age of metals, was about to begin.

Metals are found either in their pure metallic form, or, more often, in ores from which they have to be extracted. Copper and iron oxides occur on the surface of the ground and are easily melted by a campfire. This fortunate circumstance was what led to the discovery of copper and later of iron.



Silver and gold were among the first metals discovered by man but because of their softness could not be used for serviceable tools and weapons. They were highly prized as materials for ornaments, rings, bracelets, goblets, cups, plates and pitchers. Gold was especially valued for its color and non-corrosive quality.

Soon after metals were discovered, man learned to smelt them. The metal-bearing ore, mixed with fuel, was placed in a small furnace made of clay. The heat of the fire was increased by blowing the breath through a long, hollow tube or by fanning. Later the bellows was invented. Men discovered that two soft metals, copper and tin, could be fused together to form an alloy, bronze, that was harder and stronger than either of the parent-metals.

Casting and hammering were the two methods employed for making bronze objects. A model of the object to be cast was pressed into sand or clay, leaving an impression, which was filled with molten metal, which hardened into the required shape. Because of the widespread use of bronze, this period of the Era of Metals is termed the Bronze Age.





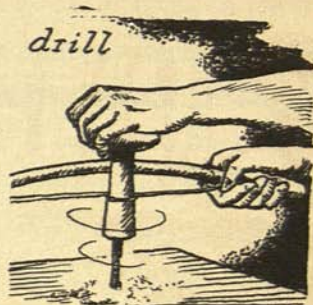
equipped, he was now able to create new things, furniture, better boats, vehicles, more elaborate dwellings.

Think what a prodigious forward step the invention of such a simple thing as a bronze saw was! Man could now produce squared strips and straight, even planks and beams.

## *Bronze Age Tools*

Man now had tools with keener, longer-lasting cutting edges, and could turn out work with a smoothness of finish not possible before.

Now he could not only improve his old tools, but develop new ones for many purposes that he had not dreamed of. Thus

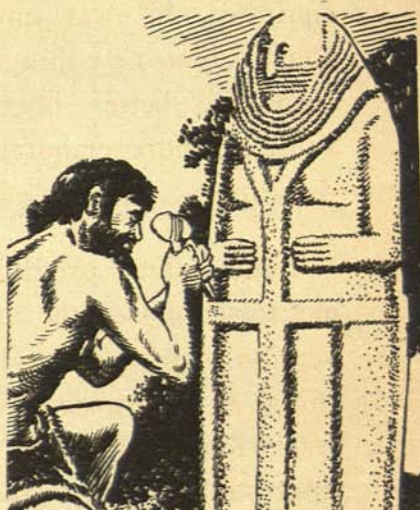


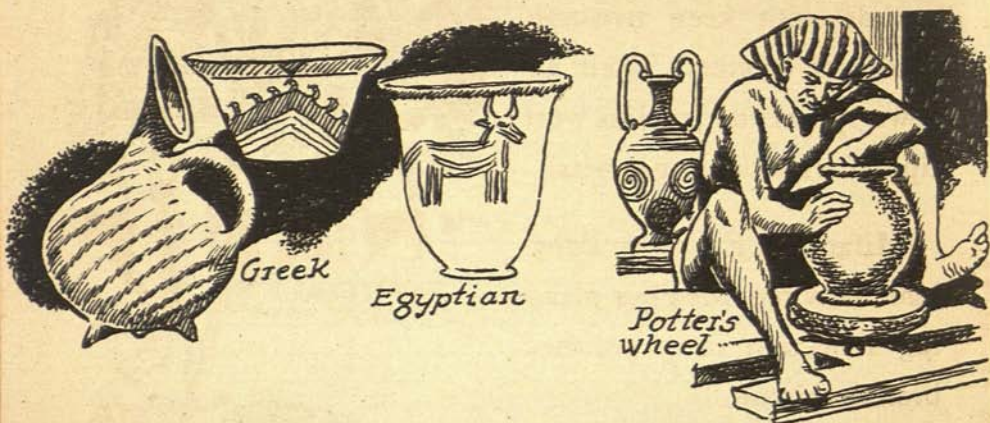


With his new tools, simple as they were, the prehistoric craftsman performed remarkable feats of workmanship. With his puny bow-drill and a spindle that was merely a pointed stick he could drill holes in the hardest stone by "feeding" emery and sand to the whirling spindle. The colossal stone statues of ancient Egypt were blocked out by this method, though after the discovery of metals a bronze tubular drill was substituted for the wooden spindle.

Nails and screws had not been invented, but the prehistoric wood-worker fastened furniture together with concealed wooden pegs, dowels and tenons, like those used in modern furniture and cabinet making.

With a heavy mallet and a bronze chisel, the early sculptors carved large statues of stone.





The discovery of metals spurred human progress into a new burst of speed, and new inventions kept pace with the introduction of new materials. Pottery was now fired to a new hardness, and burnished with a solution of hematite (iron). The potter's wheel was coming into use.

A new and quicker way of making fire was discovered, striking sparks with metal and flint, a method that was to serve until the invention of friction matches nearly six thousand years later.

Doctors, no longer sorcerers and magicians, but devoted to healing, performed operations with bronze lancet and scalpel.



Bronze Age soldiers carried short, broad thrusting swords with keen two-edge blades of bronze. Their arrows, spears and javelins were tipped with the same metal.



*Egyptian  
Soldiers*

Milady of Egypt or Babylonia now regarded her pleasing reflection in a polished bronze mirror.



Time now was told through the hours of the day and the "watches" of the night by a perforated bronze bowl that filled with water and sank in a pool in just an hour's time. A watchful slave stood by to empty and reset the bowl and strike the hour on a big bronze gong.



## *Egypt on the Eve of the Historic Era*

Six thousand years ago great barges and light galleys with painted sails and many oars moved up and down the Nile alongside humble reed boats, loaded with farm products bound for the city marketplace. They glided past long jetties and dikes built by thousands of laborers to control the waters of the great river in the flood season.

Egyptian men went about with shaven heads, although the well-to-do had tightly curled black wigs for street wear. There were yet no camels to be seen, for these animals were not introduced into Egypt until a much later date. Patient asses were then the chief beasts of burden, and horses and oxen were used as draught animals.

Bazaars and shops lined the principal streets. Here perfumes, delicate textiles, jewelry, sweetmeats, cakes and wines were displayed for sale. But only the wealthy en-







joyed such luxuries. The great mass of people, the laborers, peasant-farmers and slaves, remained just "hewers of wood and drawers of water."

Such a complicated civilization must have been many centuries developing. The Nile Valley was a perfect setting for its growth.

Had it not been for the great river, the whole region would have been a desert. From the first cataract, above which dwelt the black and warlike Nubians, the Nile flowed northward for five hundred miles like a green snake, through yellow deserts and between ranges of stony gray hills. Two hundred miles from the Mediterranean the river split into a number of channels that fanned out to form the flat and fertile Delta.

The land of Egypt in prehistoric and early historic times was divided into two rival kingdoms, each ruled by a Pharaoh and worshipping different gods. The Delta was the kingdom of Lower, or Northern, Egypt, with Memphis



as its royal city. The other, stretching upstream to the first cataract, and with its capital at Thebes, was Upper, or Southern, Egypt.

The first community efforts that led to the rise of Egyptian civilization were not born of the desires of men but were forced upon them by the Nile. The great river that gave life to Egypt often brought death and destruction. The yearly floods that carried rich soil down from the mountains at the same time drowned many of the inhabitants or drove them from their homes and fields.

An annual flood was too much for the individual farmer to cope with. It was an emergency that could only be met by thousands getting together to work on some master plan of controlling the waters of the great river.

Someone had to plan and direct these works, and the ones who did so became the leaders and, later, the rulers of the people. The Pharaohs and their advisors planned extensive flood control and irrigation projects, which were built by drafted labor, and financed by the first taxes.



The early inhabitants of the Nile Valley did not call themselves "Egyptians," but simply "remi," meaning "men."

Egyptian history — that is, written records — dates back to 4241 B.C., when the Solar Calendar was adopted. This provided for a year of 365 days, divided into twelve months of thirty days each, and five special feast days. But authorities believe that Egyptian civilization was already well under way at least another four thousand years before that.

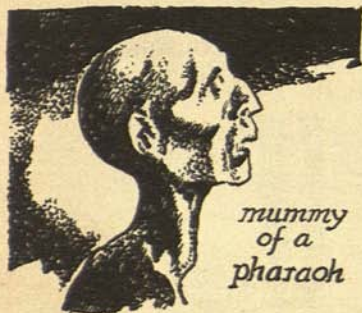
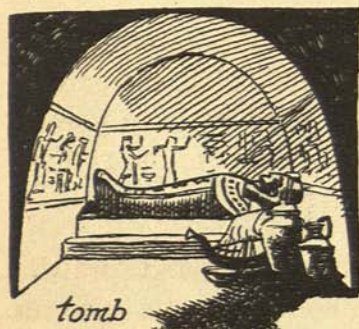
It is in that unrecorded four thousand years that the groundwork for great advances was laid. During that period the strange and complex religion of the ancient Egyptians grew up. With all their inventions and innovations, they believed that this life was only a transitory and preparatory step to a far better one beyond the grave, if they had been good in this one, and hence spent a great deal of their time thinking of and preparing for death.



*Ruins of Memphis*



## *Why the Egyptians Preserved Their Dead as Mummies*



It is surprising that the Egyptians were able to make such material progress in this world while so much of their thought was on the next. Egypt became the land of the living and the dead, where the greatest buildings were temples and tombs. They worshipped Osiris, god of all living things and ruler of the life hereafter; Isis, his faithful goddess-wife, and their son Horus, hawk-god of the sky and sun, together with a legion of lesser deities.

They believed a man's soul enjoyed bliss in the hereafter only as long as his mortal remains were preserved from decay and destruction on this earth. This was the reason why they went to such pains to preserve their dead in the form of mummies, and protect the bodies in great piles of stone and masonry.

The Egyptian land of the dead was supposed to lie at the point where the sun sank, hence when one died, he was said to have "gone west."



## Mesopotamia

At the beginning of history Mesopotamia, the land of two rivers, stretching in a narrow belt from northwest to southeast, for hundreds of miles between the Tigris and Euphrates, was dominated by the Sumerians and Chaldeans, and later by the Babylonians and Assyrians.

The Euphrates flowed southward past populous towns, enclosed with massive walls of sun-baked brick, each a city-state ruled by a king or priest-ruler. The most prominent feature of the city was the temple, dedicated to the god Bel Marduk or the goddess Ishtar (Astarte).

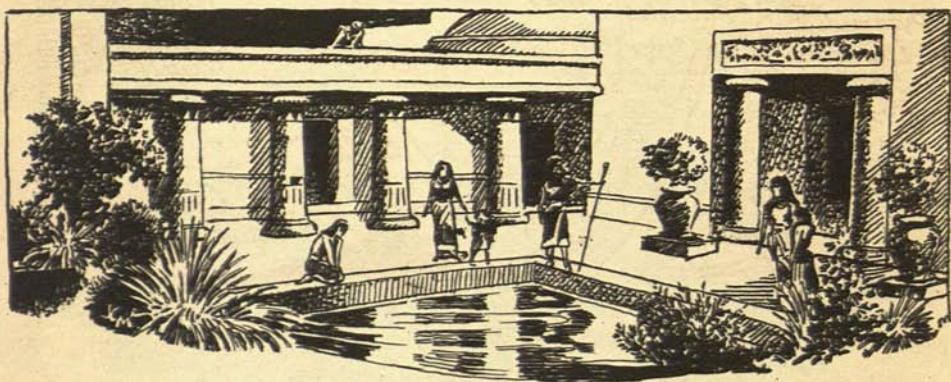
Around the base of the temple-citadel mound sprawled the flat-roofed or dome topped homes of the citizens. Through the arched city gateways, for these people were the inventors of the arch, came and went a constant stream of porters, heavily laden asses and ox carts bearing goods and farm produce.



Groups of women with water jugs paused to exchange gossip at the public wells. The street of the coppersmiths rang with the hammering of metal. Within a large enclosure skins and hides were being tanned into leather; in another, bricks and glazed tiles for building were being made. In a yard across the street grapes were being pressed into wine.

Outside the town, clustered close to the riverbank, were the reed huts of the poorest freemen, who fished in the Euphrates with drag nets, and plowed behind longhorned oxen in the miry irrigated fields. Men ferried across the river in strange, round bowl-boats, and traders used it as an avenue of commerce. Crowds of workers gathered dates from the groves of palms outside the city walls.

The wealthy enjoyed luxuries like those in Egypt. They lived in rambling two-storied houses built around spacious central courts, in which were pools and gardens. The residences were boxlike in shape, rather plain on the outside, and with few windows in front, light being admitted from the inner court.





The Sumerians and Chaldeans were Semites. Sumerian men shaved their heads; Chaldeans wore their dark hair and beards long and tightly curled. Among them were many learned scholars who were developing the sciences of mathematics and astronomy and the art of medicine. They had already adopted a lunar calendar, based on the monthly phases of the moon.





*Pharaoh and  
nobles*



*paying  
taxes*

## *The Beginning of the Feudal System*

Much has been written about feudalism in the Middle Ages, but as a matter of fact the feudal system went hand in hand with the establishment of the first monarchies, long before the dawn of history.

It was based on the principle that the king, as a descendant of the gods, owned all the land, to bestow as he chose. To carry on the affairs of the kingdom, to direct public works, to maintain a standing army and to collect taxes, matters which the sovereign could not manage alone, the king surrounded himself with nobles, who received for their services grants of land.

The noble in turn permitted the peasant-farmers living on his grant to cultivate parcels of land in return for part of their crops and military service when needed.



## *Origin of Castes*

A system of castes developed. Since the kings and pharaohs were regarded as gods, the priest class that interpreted the will of the gods had great influence.

Equally powerful were the professional warriors who formed a privileged caste. A third caste included wealthy merchants and outstanding professional men. At the bottom and most numerous, were the peasant-farmers, common laborers and slaves.

A deck of ordinary playing cards serves as a perfect reminder of the ancient feudal set-up. The "Aces" represent the gods that were worshipped. There are the "Kings" and the "Queens." The "Jacks" stand for the scheming and intriguing nobles, and the four suits commemorate the four great castes — "Hearts," the priests; "Clubs," the soldiers; "Diamonds," the merchants and "Spades," the peasant-farmers.





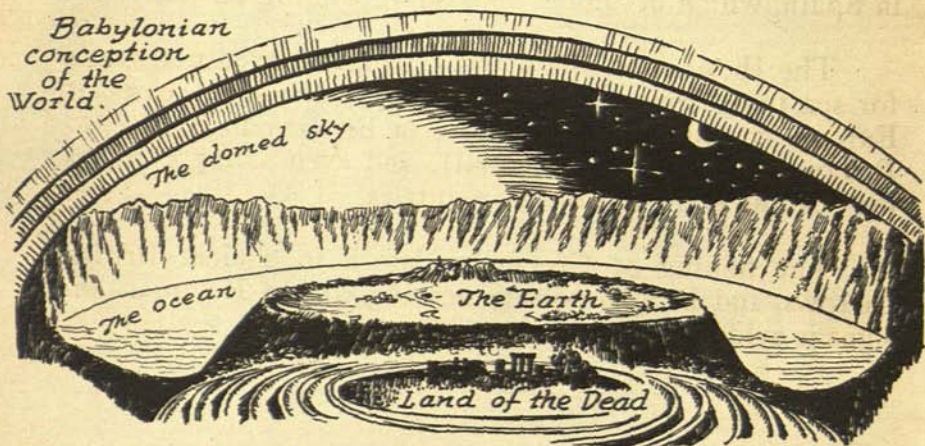
## *Ancient Conception of the Earth*

Even at the beginning of historic times in Mesopotamia and Egypt man's geographical knowledge was very limited. Few men had traveled far and there was little contact.

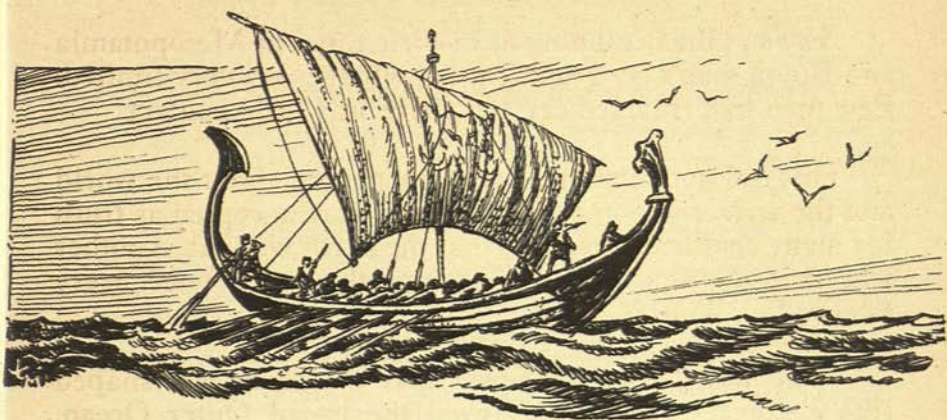
This did not keep men from pondering about the world and the universe. Some strange ideas were accepted as truth for many centuries. One was that the earth was flat. Another was that the sun revolved around the earth once every twenty-four hours.

The Babylonians believed that the earth was shaped like a saucer. Around it flowed the broad Outer Ocean, which no one had ever crossed. The sky, so they thought, was a vast, vaulted dome, its bottom edge resting on a ring of towering mountains across the Outer Ocean, far beyond the horizon. Far beneath the earth lay the silent Land of the Dead.

At that time in Chaldaea was a tribe of wandering shepherds that later migrated to Canaan, where they were known as the Sons of Abraham or the Children of Israel. These shepherds had begun to believe that there was only one God, the Heavenly Father, later worshipped as Yahveh by the Hebrews and Jehovah by the Christians.







## *Bronze Age Civilization Carried Westward*

Early in the historic era the Bronze Age culture of the Near East was carried westward by sea-borne commerce to many peoples still in the Neolithic stage, who had not yet invented writing nor begun the use of metals. Galleys, bearing the products of cultured Egypt, made commercial voyages to the Island of Crete, where a remarkable civilization, the Minoan, had been developing independently. Cretan traders relayed the products and, more important, the ideas of Bronze Age civilization to Malta, and thence to Almeria in Spain, which became a flourishing trading center.

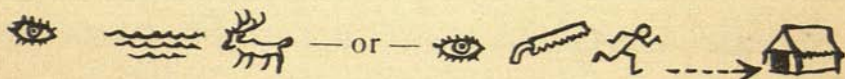
The Iberians of Spain and Portugal blazed new trails for sea trade, making long voyages up the west coasts of Europe, bearing the new culture to Brittany in France, to Britain and Hibernia (Ireland), and even as far north as the Scandinavian and Baltic countries.

The finding of Cretan beadwork in ancient British barrows, and Danish pottery bearing copied Egyptian designs is evidence of this first overseas trade.

# The Invention of Writing

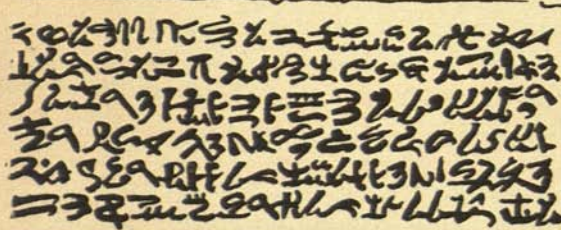
Six thousand years or more ago writing, one of man's outstanding achievements, took definite form in Egypt and Mesopotamia.

From the first, pictures had been recognized as a means of expressing ideas. Before the dawn of history pictures were gradually changed into conventional characters or symbols having a certain meaning. Sometimes a picture or symbol meant not only the object it portrayed, but stood for a sound of speech. For example:



"I see a deer" or "I saw a man running to the house."

The early Egyptian hieroglyphics were a form of phonetic writing. The Egyptians were the first to write on paper, made from the papyrus plant from which it took its name. The Babylonians wrote on tablets of clay with a stylus. The stylus scratched wedge-shaped marks on the clay, so the writing was called "cuneiform," which means "wedge-shaped."



*Egyptian hieratic—  
simplified hieroglyphics.*



*Babylonian  
cuneiform*



## *The Rest Is History*



Even after the invention of forms of writing, few men learned to read and write, and the strange scribblings remained a mystery to most people. In fact, at first this means of spreading knowledge was withheld from the common people, and practiced only by trained priests and professional scribes.

Through the long centuries that followed, the characters and symbols were further simplified and abbreviated until at last they became the pot-hooks and curlycues of modern script.

In time other languages came into use, and as the most ancient civilizations declined and crumbled away to be succeeded by new ones the old languages were forgotten. During the past century and a half experts on languages struggled for years to decipher and translate the earliest writings. At last they succeeded, and now we can read English translations of the ancient records. But that is another story.

At this point, where the scribes of ancient peoples take up the *Chronicles of Mankind*, we reach the end of our long and meandering search into the remote past, and can say literally, "the rest is History."



## *Where Do We Go from Here?*

We turn from the faltering, plodding progress of primitive man with a new appreciation of the material marvels of our own day and confidently look forward to a myriad man-made miracles yet to come. For the mind of man such breath-taking scientific and mechanical marvels are easy, for now he has the vast reservoir of human knowledge and experience accumulated over the ages to draw from.



It is on the spiritual side that men have lagged far behind. History is the record of man's failures and mistakes as well as of his achievements and triumphs. Though we often have cause to doubt it, man boasts that he is a creature that profits by experience. If he really would, the failures of the past might be turned into the victories of the future.

What the world needs most is moral and spiritual progress that will avert wars and banish ignorance, greed, prejudice and hate, crime and cruelty from the earth. Remember, men have no guarantee from the Almighty that they will continue to inhabit this planet forever. If forces of incredible power, atomic, cosmic or bacteriological, are blindly misapplied to war's destruction and annihilation, the race of men may



destroy itself and become as extinct as the dinosaurs. We and those who follow us must not let that happen.

The rise of man, despite his many slips and set-backs, has been a slow but steady ascent toward perfection. Inherent in every human is the urge to better his lot. Without it there would have been no progress.

But as man becomes more and more civilized, his urge is not only to ascend himself at other's cost, but to help others to rise with him. The parents wish their child to reach a still higher plane than the one they themselves attained. The responsibility of every generation is to carry on the torch to light the path for generations yet to come.

And so the climb, that ascent toward perfection, must go on, that all mankind may move onward and upward toward the light of a better life and a better world.



# INDEX

## A

acrobats, 204  
 Adam and Eve, 6  
 adze, 134  
 Africa, 49  
 aged, 128  
 Ages, 15  
 air pouches, 34  
 Akkad, 4  
 alligators, 56  
 Almeria, 229  
 allosaurus, 43  
 alloys, 213  
 Alps, 48  
 Andromeda, 20  
 Antarctica, 49  
 Appalachians, 48  
 anemones, 27  
 archaeopteryx, 45  
 armadillo, 65  
 art, 215  
 artifacts, 2  
 artisans, 166  
 arrowheads, 112  
 Asia, 129  
 asteroids, 21  
 astronomy, 4  
 atom bomb, 232  
 Aurignacian Period, 111  
 Azilians, 192  
 Azoic Age, 22

## B

Babylonians, 223  
 bacteria, 9  
 Bactria, 133  
 bad luck, 197

baking, 162  
 Baltic Sea, 108  
 barrows, 201  
 barter, 148  
 basket making, 138  
 Basket Makers, 129  
 battle, 173  
 beer, 204  
 bellows, 213  
 birds, 44  
 boar, 144  
 boats, 179  
 bodkins, 135  
 book lungs, 33  
 bow and arrow, 112  
 bow drill, 112  
 bowl-boats, 177  
 Broadheads, 133  
 British Isles, 108  
 brain, 31  
 brontosaurus, 40  
 bronze, 213  
 burials, 201  
 burnished pottery, 216

## C

caenopús, 57  
 Cainozoic Age, 55  
 calendar, 221  
 Cambrian Period, 28  
 Carboniferous Period, 32  
 Carnac, 198  
 carnivores, 40  
 carving, 135  
 castes, 227  
 casting, 213  
 cat, 151  
 cattle currency, 203



cave, 91  
 cave paintings, 113  
 cells, 24  
 Celts, 199  
 Chaldees, 4  
 cheese, 146  
 chickens, 151  
 children, 125  
 clams, 29  
 clan, 132  
 clay, 138  
 cliff dwellings, 129  
 clothes, 90  
 club, 82  
 coal, 32  
 cockroach, 33  
 common man, 209  
 continents shifting, 49  
 copper, 211  
 cooking, 103  
 coracle, 178  
 cotylosaur, 36  
 Crete, 229  
 Cro-Magnon Man, 105  
 cross-gait, 74  
 crustaceans, 29  
 cuneiform writing, 230

## D

dancing, 125  
 Darwin, Charles, 64  
 Dawn Men, 71  
 Death, ideas of, 128  
 Devonian Period, 31  
 diatryma, 57  
 dinosaurs, 38  
 diplodocus, 40  
 distaff, 155  
 division of labor, 118  
 dog, tamed, 142  
 dolmens, 201  
 domestication of animals, 141  
 doors, 206  
 dragon-fly, 33  
 drill, 215  
 Druids, 199  
 drums, 205

Dubois, 68  
 dwellings, 149

## E

Earth, 18  
 Egypt, 218  
 elephant, 60  
 embryos, 74  
 embryo frog, 35  
 Entelodont, 60  
 Eohippus, 57  
 epochs, 15  
 eras, 15  
 European Central Sea, 48  
 Executions, 202  
 Eyes, 29

## F

family group, 116  
 farming, 163  
 fat women, 114  
 feudal system, 226  
 fire, 100  
 fire by friction, 102  
 fish, 31  
 flail, 162  
 flax, 155  
 flagiolets, 205  
 fermentation, 204  
 flippers, 34  
 Flood, 7  
 flood control, 220  
 flour, 162  
 Folsom Men, 130  
 fossils, 9  
 frog, 35  
 furnace, 213  
 furniture, 215

## G

Galley, 229  
 games, 125  
 genealogical tree, 73  
 geologists, 5  
 Geology, 12  
 Gibraltar, 107  
 gills, 34—74

glacial waves, 86  
glyptodon, 60  
goats, 145  
gods, 195  
gold, 213  
Gondwanaland, 49  
gorilla, 69  
granary, 188  
Grimaldi Folk, 106  
grindstones, 206  
ground sloth, 60

## H

hand-axe, 95  
harp, 205  
harpoon, 111  
harvest, 163  
hatchet, 95  
Heidelberg Man, 72  
herbivores, 40  
herdsman, 148  
hesperornis, 44  
high priests, 207  
Himalayas, 48  
Holarctica, 49  
Homo Sapiens, 105  
horned dinosaur, 150  
horse, tamed; 150  
Horus, 222  
houses, 170  
Hrdlicka, Dr. Ales, 129  
hunt, 122  
hyaenadon, 56

## I

Iberians, 229  
Ice Age, 86  
ichthyosaurus, 46  
illness, 127  
Incas, back endpaper  
Indians, 131  
insects, 33  
iron, 212  
irrigation, 220  
Ishtar, 223  
Isis, 222

## J

Java Man, 68  
javelin, 110  
jellyfish, 27  
jewelry, 213  
Jupiter, 19

## K

kava, 204  
killer-dinosaurs, 42  
Keith, Sir Arthur, 73  
kings, 208  
kitchen middens, 193  
Kuban, 133

## L

lake dwellers, 186  
lamp, 110  
land forests, 55  
language, 83  
laws, 167  
legs, 34  
leather, 151  
Life, 23  
livestock, 147  
lizards, 37  
lungs, 34  
lung-fish, 34  
lyre, 205

## M

magnolias in Greenland, 50  
Malta, 114  
mammals, 52  
manual work, 180  
Magdalenian Period, 135  
mammoth, 79  
marsupial, 52  
Mars, 19  
mastodon, 60  
matriarch, 121  
Mayas, back endpaper  
medicine, 127  
mechanical aids, 182  
megalosaurus, 43



menhirs, 198  
 microlestes, 52  
 milk, 146  
 millstones, 206  
 minstrels, 204  
 mirrors, 217  
 moon, 21  
 monoclonius, 43  
 mosasaurus, 46  
 mudfish, 34  
 mummies, 222  
 musical instruments, 205  
 musk ox, 61

## N

Neanderthal Man, 75  
 Nebula, 20  
 Neocene period, 55  
 Neolithic Age, 154  
 Neptune, 19  
 newt, 34  
 Nile, 219  
 nobles, 226  
 North Sea, 108  
 Nubians, 219

## O

old people, 128  
 Oligocene Period, 55  
 oracle, 168  
 ordeals, 202  
 organisms, 23  
 Origin of Species, 64  
 Osiris, 222  
 oxen, 151  
 oxides, 212  
 oysters, 29

## P

Palaeozoic Age, 35  
 Peking Man, 71  
 pelycosaur, 36  
 Permian Period, 36  
 pig, 151  
 pile villages, 190  
 Piltdown Man, 71

Pithecanthropus, 68  
 planets, 19  
 planetesimals, 20  
 planetoids, 21  
 Pleistocene Period, 55  
 plesiosaurus, 39  
 polliwog, 35  
 polyandry, 121  
 polygamy, 121  
 pottery, 216  
 potter's wheel, 216  
 property, 169  
 pteranodon, 45  
 pterodactyl, 44  
 pulley, 206

## R

Races, 158  
 radio-activity, 15  
 ramshorns, 205  
 recreation, 125  
 reindeer, 61  
 red deer, 144  
 reptiles, 37  
 resurrection, 200  
 rhinoceros, 79

## S

Sabre-toothed tiger, 79  
 sacrifice, 199  
 salamander, 34  
 Saturn, 19  
 scapegoat, 202  
 scorpions, 30  
 scum, green, 23  
 sculpture, 215  
 Semites, 225  
 sewing, 119  
 shellfish, 29  
 shofar, 205  
 singing, 204  
 silver, 213  
 Silurian Period, 30  
 skulls, 69  
 slavery, 174  
 solar system, 18

Solutreans, 134  
 soul, 126  
 spear, 96  
 speech, 83  
 Sphenodon, 51  
 spinning, 155  
 sponges, 27  
 sports, 125  
 stars, 185  
 starfish, 28  
 Stairway of Life, 15  
 stegosaurus, 43  
 Stonehenge, 198  
 strata, 12  
 Sumer, 4  
 sun dial, 184  
 superstitions, 196  
 swamp forests, 32  
 swimming, 176  
 swimming bladders, 34

## T

tabus, 196  
 tally, 185  
 taxes, 220  
 Thebes, 219  
 theriodont, 52  
 Tibet, 131  
 time clock of Geology, 17  
 tools, 93, 214  
 Toltecs, back endpaper  
 torch, 103  
 totems, 132  
 trachodon, 39  
 trade, 203  
 tradition, 3

tree-ferns, 32  
 Triassic Period, 38  
 tribunals, 202  
 triceratops, 43  
 trilobites, 30  
 tyrannosaurus rex, 42

## U

Uintathere, 56  
 Upper Egypt, 219  
 Ur, 4  
 Uranus, 19

## V

Venus, 19  
 vertebrates, 31  
 Vinci, Leonardo da, 7

## W

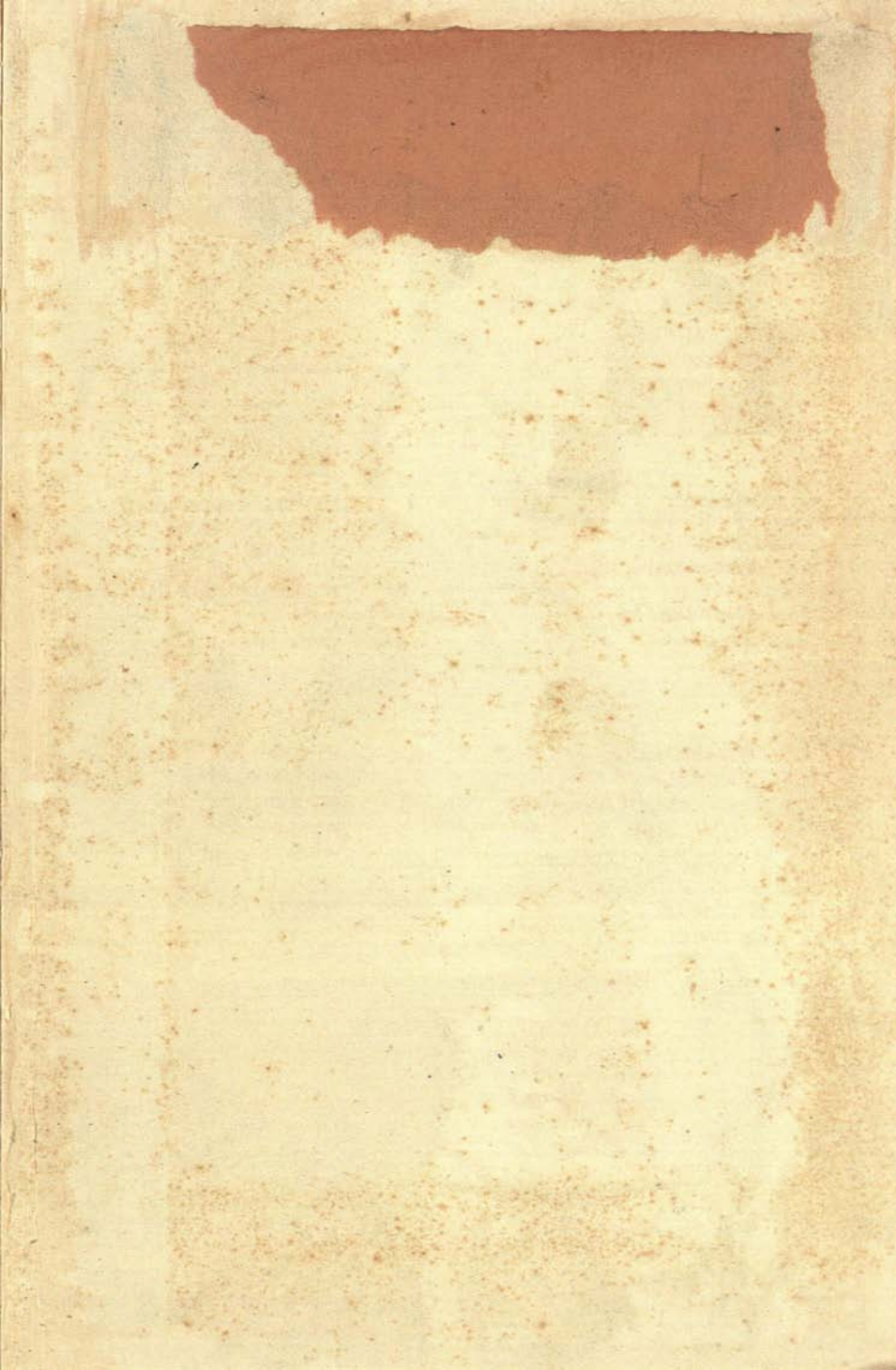
wandering star, 18  
 wars, 172  
 water clock, 217  
 weaving, 156  
 whistles, 205  
 White Race, 158  
 wild ass, 151  
 wild boar, 144  
 wine making, 204  
 windlass, 206  
 wives, bought, 153  
 wolf, 144  
 writing, 230

## Y

yodelling, 204

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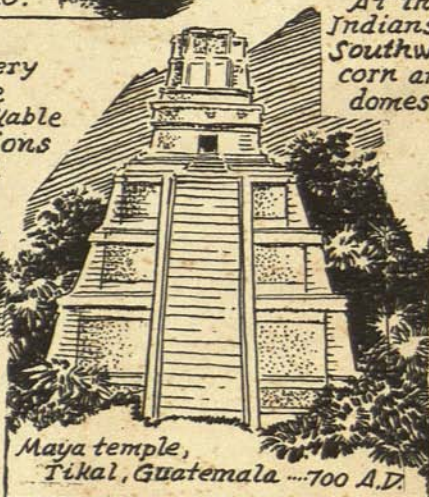
*Ancient American  
Civilizations rivalled  
that of Prehistoric  
Egypt .....*



*Prehistoric  
Apartments,  
New Mexico.*

*Many centuries  
before the discovery  
of America by the  
White Man remarkable  
Indian civilizations  
had grown up in  
Central America  
and Peru .....*

*At the time of Christ  
Indians of the American  
Southwest cultivated  
corn and beans and  
domesticated the turkey.*



*Maya temple,  
Tikal, Guatemala ....700 A.D.*

*The Toltecs,  
master builders,  
erected great  
stone temples  
and palaces  
in Yucatan .....*



*Aztec sculpture,  
Mexico, 1500 A.D.*

*The Aztecs had a highly  
organized monarchical  
government, laws and religion.*



*Toltec,  
Mexico,  
1000 A.D.*

*Inca  
portrait  
Jar,  
Peru.*



*Machu  
Picchu,  
Inca stronghold.*



# The Mystery of the Mound Builders .....

Early white explorers that ventured into the Ohio Valley were puzzled and excited with curiosity on coming upon many round "hills" that showed they had been built up by men .....

Had the explorers stumbled upon ruins like the Pyramids of Egypt, that might disclose the splendor of some enlightened

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