

ARIES -
ORION -
TAURUS -
BOOTES -
AQUARIUS -
PISCES -
SCORPIO -
CORVUS -
CEPHEUS
CASSIOPEIA

- 0) ARIES
- 1) TAURUS
- 2) AQUARIUS
- 3) CORVUS
- 4) BOOTES
- 5) PISCES
- 6) CASS . .
- 7) SCORPIUS
- 8) ORION
- 9) CEPHEUS

ARIES

DOTS : 39,164 63,81 63,114 70,93 >FF

LINES : 63,84, 63,112 / 66,83, 69,91 / 69,96, 65,112 /
61,117, 41,162 / >FF

TAURUS

DOTS : 31,87 53,77 56,136 59,139 63,139 64,135 62,131
76,152 81,140 86,150 >FF

LINES : 33,89, 55,134 / 54,80, 62,129 / 67,136, 78,139 / 83,143, 85,146 /
65,142, 69,150 / >FF

AQUARIUS

DOTS : 67,80 49,90 47,123 39,123 35,118, 35,129 49,141 71,160 >FF

LINES : 65,81,52,88 / 49,93, 47,121 / 45,123, 42,123 / 37,120, 38,121 /
38,126, 37,127 / 47,126, 49,139 / 52,143, 70,158 / >FF

CORVUS

DOTS : 37,98 42,136 69,89 67,141 >FF

LINES : 37,101 42,134 / 45,137, 65,140 / 67,139, 69,92 / 67,91, 40,97 / >FF

BOOTES

DOTS : 79,98, 59,107 39,116 32,136 46,142 >FF

LINES : 75,100, 62,106 / 57,108, 42,116 / 37,119, 34,134 / 35,138, 44,141 /
49,140, 77,100 / >FF

PISCES

DOTS : 23,109 30,99 44,102 64,90 79,79 97,68 80,106
82,116 84,162 87,175 85,188 94,195 99,183 97,172 >FF

LINES : 42,102, 33,100 / 28,102, 24,107 / 26,109, 42,104 / 47,102, 62,93 /
67,89, 77,82 / 82,79, 95,71 / 97,71, 82,104 / 80,109, 82,114 /
82,119, 84,160 / 84,165, 87,173 / 87,178, 85,186 / 87,191, 92,194 /
96,163, 99,186 / 99,181, 98,175 / 95,173, 90,175 / >FF

SCORPIUS

DOTS: 28, 146 32, 149 37, 150

41, 128 44, 129 48, 122

61, 118 68, 118 76, 116 79, 111 80, 78 77, 91 73, 9a

LINES: 68, 93 69, 96

71, 93 72, 93 / 75, 92 76, 92 / 79, 93 80, 92 / 80, 101 80, 110 /
79, 113 78, 115 / 71, 118 74, 115 / 64, 119 68, 119 / 59, 119 51, 122 /
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ORION

DOTS: 27, 91 29, 88 44, 86 52, 93 48, 108 46, 113 46, 110

57, 118 65, 143 54, 150 48, 149 42, 150

76, 104 76, 110 79, 98 83, 114 85, 102 88, 103

97, 118 87, 102

LINES: 32, 88 43, 86 / 47, 87 51, 91 / 53, 96 57, 116 / 57, 121 65, 141

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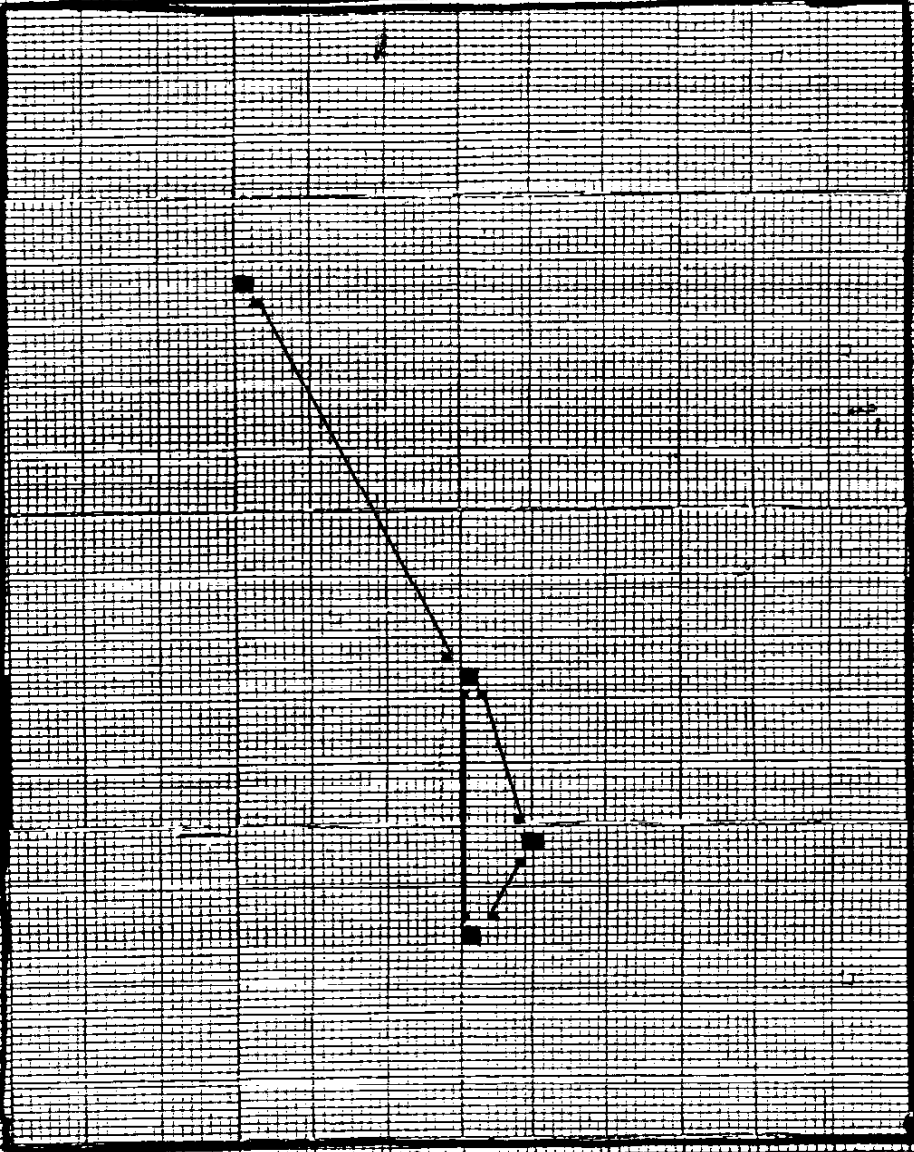
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ARIES the RAM

ARIES



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15 23 31 39 47 55 63 71 79 87 95 103 111

goddess Hera sent the monster to guard Icarus (see Icarus; HERA). But Hermes put and cut off his head. Hera scattered the head in a peacock's tail.

Argus-eyed is sometimes used to describe a vigilant person. Argus, or Argos, is also Odysseus' hunting dog. The dog recognized Odysseus when he returned from his 10 year journey during the Trojan War.

VAN JOHNSON

ARGENT, is the trade name for a compound of silver and protein, whose proper name is silver nitrate. The solution of Argyrol in water is used to treat the eyes, nose, and throat.

ARHUS, or **AARHUS** (pop. 238,138), is the second largest city in Denmark. It is a seaport on the west coast of Jutland, and a trading and industrial center. It has a fine cathedral, built about 1200, and was founded in 1928. For location, see DENMARK.

JENS NYHOLM

ARIA, a vocal solo in an opera, oratorio, or other musical composition. It usually has three parts. The first is usually the most melodious and the second and third are usually more dramatic. Beginning in the 1600's, Italian composers wrote many different types of arias. The development of the sonata. It is usually a sonata's slow movement. RAYMOND KENDALL

ARCEPHILA (The Elements of Opera).
ARCEPHILA, was a daughter of Minos, king of Crete, in Greek mythology. When Theseus came to slay the Minotaur, Ariadne fell in love with him. She helped him kill the Minotaur by giving him a ball of thread as he entered the labyrinth. Theseus killed the Minotaur and fled from Crete. He took Ariadne to the island of Naxos. Dionysus deserted her on the Isle of Naxos. Dionysus married her. See also BYRINITH; MINOTAUR; THESEUS. H. L. STOW



Vatican Museums (Alinari from Art Reference Bureau). This marble sculpture is in the Vatican Museums in Rome.

ARIANISM, an early theological view taught by Arius, a priest of Egypt. About A.D. 318. Arius and his followers held the doctrine that the three Persons of the Trinity—the Father, the Son, and the Holy Spirit—were not equal. Arius denied that Jesus Christ, the second Person of the Trinity, was completely

ARIES

divine. Arius taught that the Son was created by God the Father and was inferior to Him. According to Arius, Jesus was not eternal but was a superior being created by God to redeem the human race. Arius believed that both the Father and the Son were superior to the Holy Spirit.

In 325, the Council of Nicaea condemned Arius' teachings as heresy and affirmed that Jesus was completely divine (see NICENE COUNCILS). However, the view that Jesus Christ was not truly God continued to be taught in the eastern Roman Empire during the 300's.

The Council of Constantinople condemned Arianism as heresy in 381, and it quickly disappeared within the Roman Empire. But followers of Arianism remained active outside the empire. Arian missionaries converted the German tribes of northern Europe to Christianity during the 300's and 400's. After these tribes invaded the Roman Empire, they reintroduced Arianism. Arian teachings received support until the 600's, when the last German tribes were converted to orthodox Christianity.

WILLIAM J. COURTENAY

See also **ARIUS**; **TRINITY**.

ARIAS, HARMODIO. See **PANAMA** (Progress as a Nation).

ARICA. See **TACNA-ARICA DISPUTE**.

ARIEL DAM. See **MERWIN DAM**.

ARIES, **AIR EZZ**, is the first sign of the zodiac. It is symbolized by a ram. Astrologers believe that Aries is ruled by the planet Mars, which is named for the ancient Roman god of war. Aries is a fire sign.

Astrologers regard people born under the sign of Aries, from March 21 to April 19, as active, strong, and fierce-tempered. Arians often seem to be in a hurry. They like excitement and variety, and they tend to lose interest in tasks that require a long period of time. Arians like to compete and are excellent athletes. They also do well as fire fighters, soldiers, and surgeons and in other occupations that require physical skill.

CHRISTOPHER MCINTOSH

See also **ASTROLOGY**; **HOROSCOPE**; **ZODIAC**.

WORLD BOOK illustration by Robert Keys

<p>Aries—The Ram</p> <p style="text-align: center;">Symbol</p> <p>Birth dates: March 21—April 19. Group: Fire. Characteristics: Bold, courageous, determined, energetic, hot-tempered, impatient.</p>	<p>Signs of the Zodiac</p> <p>Aries Mar. 21—Apr. 19</p> <p>Taurus Apr. 20—May 20</p> <p>Gemini May 21—June 20</p> <p>Cancer June 21—July 22</p> <p>Leo July 23—Aug. 22</p> <p>Virgo Aug. 23—Sept. 22</p> <p>Libra Sept. 23—Oct. 22</p> <p>Scorpio Oct. 23—Nov. 21</p> <p>Sagittarius Nov. 22—Dec. 21</p> <p>Capricorn Dec. 22—Jan. 19</p> <p>Aquarius Jan. 20—Feb. 18</p> <p>Pisces Feb. 19—Mar. 20</p>
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TATUM, EDWARD LAWRIE

the other eye. He arrived in New York City in 1932 as an accompanist for a singer. He soon became a favorite soloist in the small nightclubs along Manhattan's West 52nd Street, a hotbed of jazz during the 1930's and 1940's. Tatum led a trio for many years. However, he was one of the rare jazz pianists who needed no support from a rhythm section.

LEONARD FEATHER

TATUM, EDWARD LAWRIE (1909-1975), an American biochemist, shared the 1958 Nobel prize for physiology or medicine for discovering that genes regulate specific chemical processes. He and George W. Beadle found that mutations caused by X rays and biochemical processes are passed on to successive generations. Tatum was born in Boulder, Colo.

HENRY H. FERTIG

See also **BEADLE, GEORGE W.**; **HEREDITY** (Genetics).

TAUGHANNOCK FALLS. See **FINGER LAKES.**

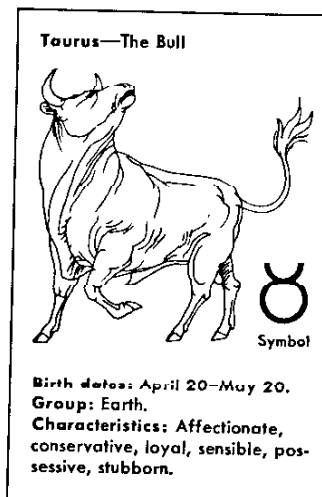
TAUMSAUK PROJECT. See **MISSOURI** (Electric Power).

TAUNTON FLAG. See **FLAG** (color picture: Flags in American History).

TAURUS. See **ALDEBARAN.**

TAURUS is the second sign of the zodiac. Taurus, an earth sign, is symbolized by a bull. Astrologers believe that the planet Venus, named for the ancient Roman goddess of love and beauty, rules Taurus.

According to astrologers, people born under the sign of Taurus, from April 20 to May 20, are loyal, patient, practical, and trustworthy. They appreciate beauty, comfort, and the countryside. Taureans move slowly



Signs of the Zodiac

Aries
Mar. 21—Apr. 19
Taurus
Apr. 20—May 20
Gemini
May 21—June 20
Cancer
June 21—July 22
Leo
July 23—Aug. 22
Virgo
Aug. 23—Sept. 22
Libra
Sept. 23—Oct. 22
Scorpio
Oct. 23—Nov. 21
Sagittarius
Nov. 22—Dec. 21
Capricorn
Dec. 22—Jan. 19
Aquarius
Jan. 20—Feb. 18
Pisces
Feb. 19—Mar. 20

and can be lazy, but they are determined to finish any task they begin. They have a down-to-earth personality and rely on their common sense.

Taureans, though not talkative, are affectionate, friendly, and warm-hearted. They are even-tempered but can become fierce when angered. They are stubborn, and tend to keep grudges.

CHRISTOPHER MCINTOSH

See also **ASTROLOGY**; **HOROSCOPE**; **ZODIAC.**

TAUSSIG, TOU sig, FRANK WILLIAM (1859-1940), was a leading American economist. In principle, he favored free trade, but in practice he accepted moderately protective tariffs. He served as the first chairman

of the U.S. Tariff Commission (now the International Trade Commission) from 1917 to 1919. He taught economics at Harvard University from 1901 to 1935. His *Principles of Economics* was first published in 1911 and was a leading textbook on economics for nearly 25 years. Taussig was born in St. Louis, Mo.

DUDLEY DILLARD

TAUSSIG, HELEN BROOKE (1898-), is an American physician who specializes in children's heart diseases. She discovered the major defect that causes the bluish tinge in the skin of *blue babies* (see **BLUE BABY**).

From 1930 to 1963, Taussig served as chief of the Cardiac Clinic of the Harriet Lane Home, the children's section of the Johns Hopkins Hospital in Baltimore. She found that blue babies have a partial blockage of the pulmonary artery at birth. The heart pumps blood through this artery to the lungs, where oxygen enters the blood. A lack of oxygen in the blood gives the skin a bluish color. In 1944, Taussig and a surgeon, Alfred Blalock, developed an operation that enables the blood to bypass the faulty artery.

Taussig was born in Cambridge, Mass. She graduated from the University of California in 1921 and received her M.D. degree from the Johns Hopkins University School of Medicine in 1927.



WORLD BOOK photo by E. F. Hoppe
Helen Brooke Taussig

MIRIAM SCHNEIR

TAUTOG. See **BLACKFISH.**

TAWNEY, RICHARD HENRY (1880-1962), was a noted British historian and social philosopher. His most famous work, *Religion and the Rise of Capitalism* (1926), related economic growth in the 1500's and 1600's to the spread of Protestantism. According to Tawney, such virtues as hard work and efficiency, stressed by the Protestants, contributed to the success of capitalism. In *The Acquisitive Society* (1920) and *Equality* (1931), Tawney argued for a more just and humane society based on the moderate and democratic socialism of the Fabian Socialists (see **FABIAN SOCIETY**). Tawney was born in Calcutta, India, and attended Oxford University. He was an expert on English history between 1485 and 1715. He was a professor of economic history at London University from 1931 to 1949.

ROLAND N. STROMBERG

TAX COURT, UNITED STATES, is a federal court that handles disputes involving income, estate, gift, and other taxes. Taxpayers who cannot reach an agreement with the Internal Revenue Service may appeal to the U.S. Tax Court. The court has offices in Washington, D.C., but it holds sessions at locations throughout the country for the convenience of taxpayers.

Taxpayers may choose to take a case involving \$1,500 or less to the court's Small Tax Division. This division provides simplified procedures for handling cases, and its decisions are final. All other Tax Court rulings may be appealed to the U.S. Court of Appeals and then to the Supreme Court of the United States.

The Tax Court was established in 1924 as the U.S. Board of Tax Appeals. It received its present name in 1969.

Critically reviewed by the UNITED STATES TAX COURT

AQUARIUS

also appear. The cloudiness and bubbles will disappear in a day or two. After that time, a new cloudiness might appear, caused by bacteria. This condition will also probably clear up in a few days.

Choosing Fish and Plants

Fish. Beginners should choose hardy, inexpensive fish that do not have a tendency to fight or chase other fish. Popular fish for beginners include angelfish, cardinal tetras, guppies, neon tetras, platies, and white clouds. The aquarist must be careful not to put too many fish in the tank. The total length of the fish in inches should be no greater than the number of gallons in the tank.

Most aquarists begin with fish that give birth to fully-formed young that are able to swim. These fish, called *livebearers*, include guppies and platies. Most female livebearers will produce young about every six weeks when the water is kept at about 75° F. (24° C).

A livebearer about to give birth can be identified by her bulging belly and by the dark spot on the bottom of her body. The *fry* (young fish) should be kept separate until they get big enough to live among adult fish without being eaten.

Some kinds of fish hatch their young from eggs. These fish are called *egg-layers*. Good egg-layers for beginning aquarists include cardinal tetras, neon tetras, white clouds, and small angelfish. In order to breed, a female egg-layer that is swollen with eggs should be placed in a separate tank with a male. Such egg-layers as the white cloud produce eggs readily in the aquarium. Babies of egg-layers are more difficult to raise than livebearers. Livebearers and egg-layers can live in the same tank.

Plants make the aquarium more attractive and provide some food and shelter for the fish. Good aquarium plants include *Elodea*, which can be stuck in the gravel or floated on the surface, and *Vallisneria*, which takes root in the gravel. Many aquarists use plastic plants.

Keeping the Fish Healthy

Most aquarium fish are fed at least once a day. At each feeding, fish should receive no more food than they can eat in five minutes. Most tropical fish eat live and processed brine shrimp, small shellfish called *Daphnia*, and red worms called *Tubifex*. Some fish can find particles of food overlooked by others, and so help clean the tank. These fish include catfish and algae eaters.

Many fish diseases can spread quickly and kill all the fish in an aquarium. Signs of illness in a fish include fading or darkening of its color, funguslike growths, poor appetite, slow or unusual movement, and spots. If any of these signs appear, the affected fish should be placed into a separate tank. A tropical fish dealer can provide information on treatment.

New fish should not be placed directly into the aquarium. The fish should have a chance to adjust to the temperature of the water. A good way to help the fish adjust is to float the plastic bag containing the new fish in the aquarium for several minutes. Some aquarists keep new fish in a separate tank for several days to check them for disease.

HERBERT R. AXELROD

See also GOLDFISH; TROPICAL FISH.

AQUARIUS is the 11th sign of the zodiac. It is symbolized by a person carrying a pitcher of water. As-

Aquarius—The Water Bearer



Birth dates: Jan. 20–Feb. 18.

Group: Air.

Characteristics: Curious, independent, modern, open-minded, outgoing, serious.

Signs of the Zodiac

Aries
Mar. 21–Apr. 19
Taurus
Apr. 20–May 20
Gemini
May 21–June 20
Cancer
June 21–July 22
Leo
July 23–Aug. 22
Virgo
Aug. 23–Sept. 22
Libra
Sept. 23–Oct. 22
Scorpio
Oct. 23–Nov. 21
Sagittarius
Nov. 22–Dec. 21
Capricorn
Dec. 22–Jan. 19
Aquarius
Jan. 20–Feb. 18
Pisces
Feb. 19–Mar. 20

WORLD BOOK illustration by Robert

trologers believe that Aquarius is ruled by two planets, Saturn, which they consider a stern planet; and Uranus, the planet of change and disturbance. Aquarius is an air sign.

Astrologers believe that people born under the sign of Aquarius, from January 20 to February 18, show the influence of Saturn by being serious-minded. However, their independence and love of freedom reflect the influence of Uranus. Aquarians do not respect tradition and they enjoy shocking people by their behavior.

Aquarians have powerful, logical, and scientific minds. They are always open to new ideas. Aquarians have many friends but are hard to get to know deeply. They usually avoid close personal relationships. Aquarians support social and political causes with great enthusiasm.

CHRISTOPHER McINTYRE

See also ASTROLOGY; HOROSCOPE; ZODIAC.

AQUATIC PLANT. See WATER PLANT.

AQUATINT. *ACK* with *TINT*, is a method of engraving or etching upon copper or steel plates in which the artist cuts into the plate in mass instead of in thin lines. Aquatint creates a pleasing, shaded, granular texture.

In aquatint, the artist first scatters powdered rosin uniformly over a metal plate. When warmed, the rosin grains stick to the plate without combining. This process leaves tiny portions of the metal open to the action of an acid. The acid *bites* (eats into) the metal around the edges of the grains. The length of biting controls the range of light and dark tones.

Artists seldom use straight aquatint. They usually combine it with etching or engraving and various acid-proof coatings.

RALPH MAYER

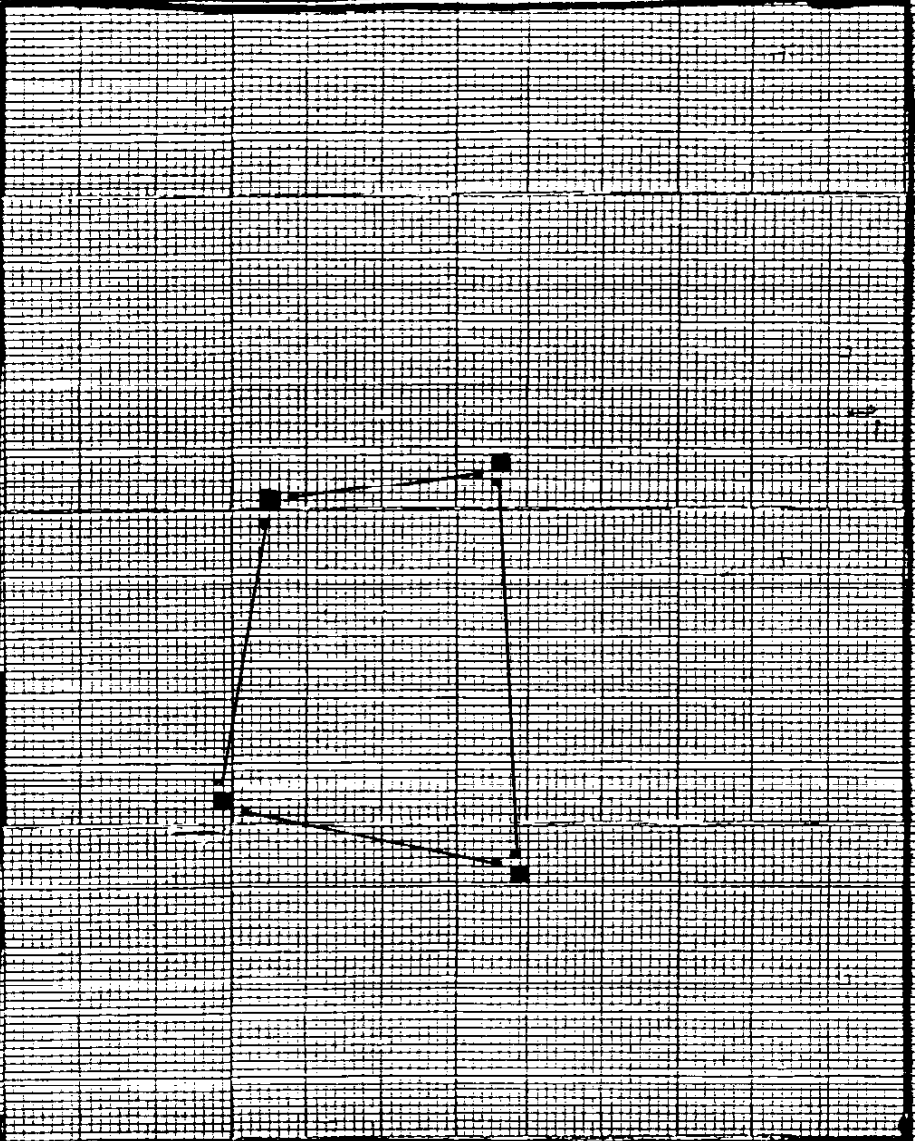
AQUAVIT. See ALCOHOLIC DRINK.

AQUEDUCT is an artificial channel through which water is conducted to the place where it is used. The materials used for aqueduct construction may be masonry, concrete, cast iron, steel, or wood. Some aqueducts are tunnels dug through rocks, and others are canals in the earth. In many aqueducts, the outlet is so much lower than the water source that gravity alone carries the water. Where gravity is insufficient, the water is forced through the aqueduct by pumps.

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CORVUS

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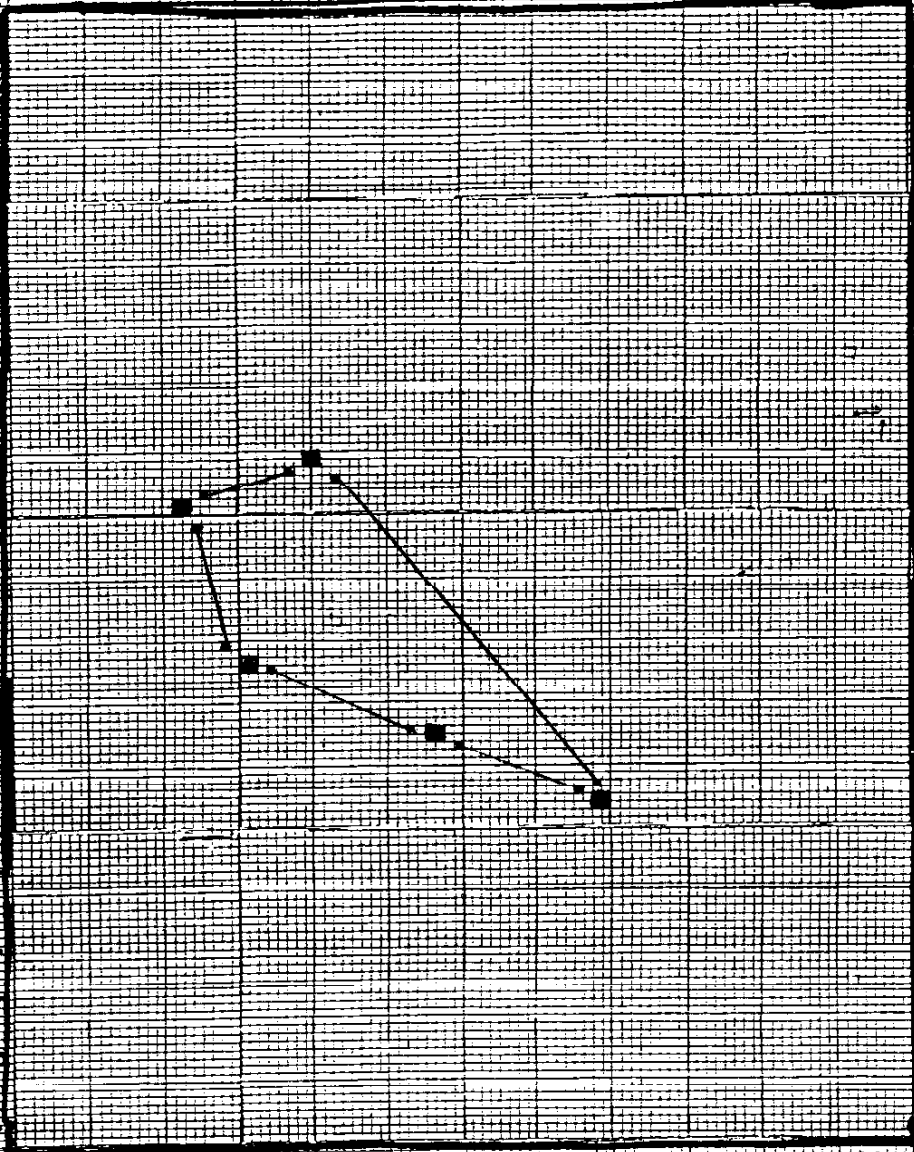


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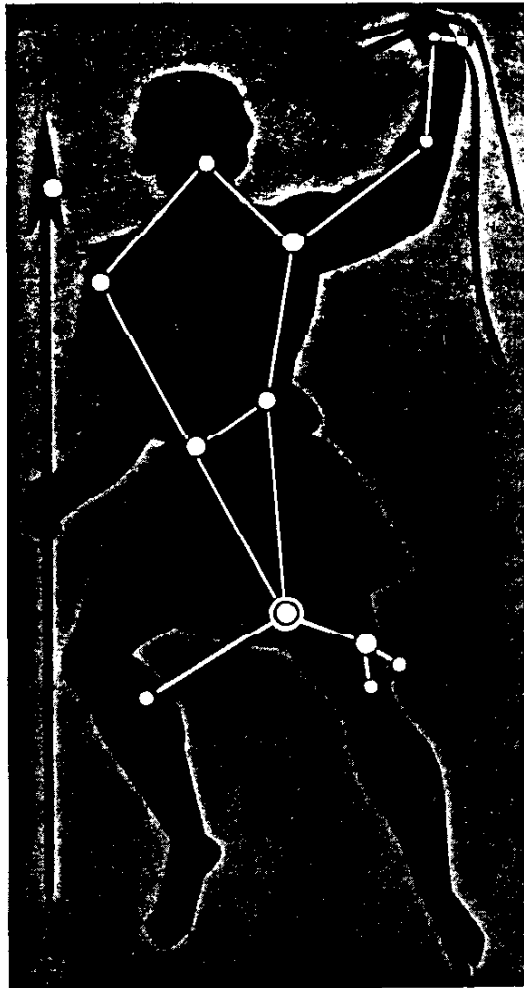
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BOOTES

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The Constellation Boötes, the Huntsman

BOÖTES, boh OH teez, is a constellation in the northern celestial hemisphere. It can be found easily at night because it contains Arcturus, one of the brightest stars in the northern sky.

Boötes is known by several names. It is usually called *The Huntsman* because it seems to hold the leashes of The Hunting Dogs, the constellation Canes Venatici. Some people called Boötes *The Bear Driver* because it seems to chase Ursa Major and Ursa Minor, the Great and Small Bears, across the sky.

Mythology has many stories about the origin of Boötes. According to one legend, Boötes is Arcas, the hunter-son of Callisto, the Great Bear. I. M. LEVITT

See also ARCTURUS.

BOOTH is the name of a family that became known for leadership in the Salvation Army.

William Booth (1829-1912) founded the Salvation Army. He had been a Methodist minister, but withdrew from the church in 1861 to dedicate his life to work among the poor. In 1865, he and his wife began evangelistic work in London. They held open-air meetings

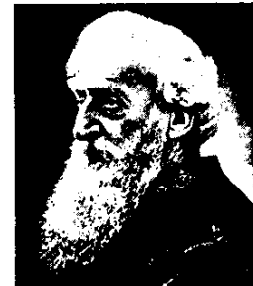
and tried to brighten the lives of the poor people in the East End of the city. They organized their converts into a mission band. This later developed into the semimilitary organization that in 1878 was named the Salvation Army.

The organization's meetings, its stirring music, and the zeal and self-denial of its workers soon became widely known. Booth was raised to the highest rank, that of general. He wrote many of the hymns sung in the meetings, and founded the weekly newspaper of the organization, *The War Cry*. His book *In Darkest England* presents his ideas on how to deal with vice and poverty. At first, Booth was ridiculed and violently opposed, but he later gained the highest respect. His children and grandchildren carried on the Salvation Army's program. Booth was born in Nottingham, England.

William Bramwell Booth (1856-1929), the oldest son of William Booth, succeeded his father as general of the Salvation Army in 1912 and served until 1922. He was born in Halifax, England, and became associated with the Army at an early age. In 1880, he was appointed chief of staff.

Ballington Booth (1857-1940), the second son of William Booth, commanded the Salvation Army in the United States from 1887 to 1896. In that year, he left the Army to found an organization called the United Society of Christian Workers. His wife, Maud Ballington Booth, shared his command in the United States. As a young

William Booth
SALVATION ARMY, INC.



Evangeline Booth



woman, she had helped establish the Salvation Army in France and Switzerland.

Catherine Booth-Clibborn (1858-1955), a daughter of William Booth, led in establishing the Salvation Army in France and Switzerland. She was born in London, England. Like many men who married into the Booth family, her husband, Colonel Sydney Clibborn, added the Booth name to his own.

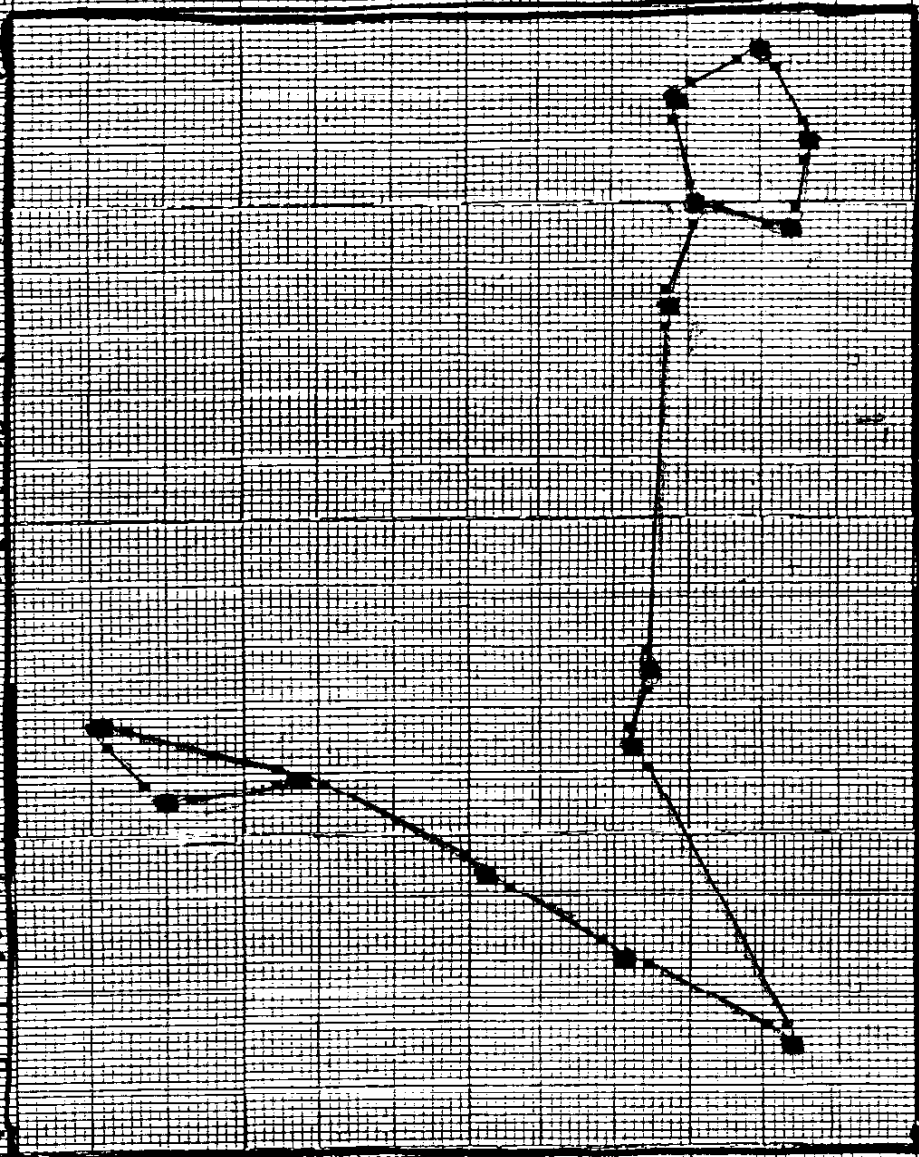
Emma Moss Booth-Tucker (1860-1903), the youngest daughter of William Booth, became a Salvation Army leader in India and the United States. She was born in Gateshead, England. Her husband, Frederic George de Latour Booth-Tucker, started Salvation Army missionary work in India in 1881. They led a national command in the United States from 1893 to 1903, when Mrs. Booth-Tucker was killed in a railroad accident.

Herbert Henry Booth (1862-1926), the third son of William Booth, served as commander of the Salvation Army in Canada and Australia. He later left the Army and became a wandering preacher in the United States.

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PIRE, DOMINIQUE GEORGES

PIRE, *DEFT.* DOMINIQUE GEORGES (1910-1969), a Belgian priest, was awarded the Nobel peace prize in 1958 for his work in aiding persons who had to flee their homelands after World War II. His organization, "Aid to Displaced Persons," finds sponsors and builds villages for persons who have no homes. Father Pire founded many other international relief organizations. He was born in Dinant.

ALAN KEITH-LUCAS

PIRENNE, *DEFT.* REHN. HENRI (1862-1935), was a Belgian historian. He is best known for his seven-volume *History of Belgium* (1900-1932), considered the standard work on the subject. Pirenne specialized in studying medieval economic history, and especially medieval cities. Pirenne's works are noted for their scholarship and bold interpretations, often challenging traditional views. His *Medieval Cities* (1925) and *Mohammed and Charlemagne* (published in 1937 after his death) became classics of historical interpretation, and are still widely read. Pirenne theorized in *Mohammed and Charlemagne* that the Muslim conquests, rather than Germanic invasions, ended the Roman Empire and the ancient world. But many scholars dispute Pirenne's theory today.

Pirenne was born in Verviers, Belgium. He was a professor of history at the University of Ghent from 1886 to 1930. While imprisoned by the Germans during World War I, Pirenne wrote a *History of Europe* without using books or notes.

ROLAND N. STROMBERG

PIROGUE, *PUH* ROHG, is a special kind of dugout canoe. The Louisiana pirogue is a flat-bottomed boat made from a cypress log. People use these boats for fishing and transportation in the swamps and bayous of southern Louisiana. The boats may be from 6 to 20 feet (1.8 to 6 meters) long. They have round, flaring sides and a sharp bow. Either paddles or poles are used to propel pirogues.

ROBERT H. BURGESS

PISA, *PEE* zuh (pop. 102,952), is an old city of Italy famed for its marble bell tower (see **LEANING TOWER OF PISA**). It lies on both banks of the River Arno. For location, see **ITALY** (political map). Pisa has a university founded in 1343 and an academy of fine arts established by Napoleon. The town also has valuable art treasures. The house where the scientist Galileo was born is in Pisa. The town is an important manufacturing center.

SHEPARD B. CLOUGH

PISA, COUNCIL OF, met in 1409 to end the division of the Roman Catholic Church called the *Great Schism of the West*. This division had disturbed the church for 30 years. At the time, two popes, Gregory XII and Benedict XIII, claimed the allegiance of the church. At the Council of Pisa, the two rival popes agreed to give up their claims so that a new pope could be chosen. But both failed to do so, and both were deposed.

The council elected Alexander V, but Gregory and Benedict refused to lay aside their rights. The schism continued for eight more years. It finally ended in 1417, when another council met at Constance and elected Martin V as the new pope.

FULTON J. SHEEN

See also **POPE** (The Troubles of the Papacy).

PISA, LEANING TOWER OF. See **LEANING TOWER OF PISA**.

PISANO was the name of two Italian sculptors and architects—**Nicola** (1205?-1278?) and his son **Giovanni**

(1250?-1314?). Both created works that were forerunners of Renaissance art.

Nicola Pisano was born in southern Italy, and later moved to Pisa. His first important work was the six-sided pulpit (1260) in the Baptistery of Pisa. He created a new, rich form for the pulpit, and promoted in the region of Tuscany the idea of borrowing designs from ancient monuments. In the panels that decorate the pulpit, he used antique forms and details to achieve quiet dignity. See **GOTHIC ART** (picture).

About 1265, Nicola accepted two important commissions—the Shrine of St. Dominic in Bologna and the large eight-sided pulpit for the Cathedral of Siena. The shrine was created almost entirely by his assistants. For the pulpit, Nicola abandoned the calm and dignity of his earlier style for more emotional and realistic elements. This change has greater emphasis in the work of Giovanni Pisano, who assisted his father.

Giovanni's pulpit (1298-1301) for the Church of Santa Andrea in Pistoia shows the influence of Gothic art. The figures that decorate his huge pulpit (1302-1310) in the Cathedral of Pisa suggest a feeling of frenzied motion.

G. HAYDN HUNTLEY

See also **SCULPTURE** (Italian Renaissance; picture; The Massacre of the Innocents).

PISCATAQUA RIVER. See **NEW HAMPSHIRE** (Rivers).

PISCES, *PIHS* eez or *PI* seez, is the 12th sign of the zodiac. It is symbolized by two fish. Astrologers believe that Pisces is ruled by two planets, Jupiter and Neptune. Pisces is a water sign.

According to astrologers, people born under the sign of Pisces, from February 19 to March 20, are ruled by their emotions, rather than by reason. Pisceans are talented and have vivid imaginations. However, it is difficult for them to make decisions or to solve practical problems. They often retreat from reality into a world of their own dreams and fantasies.

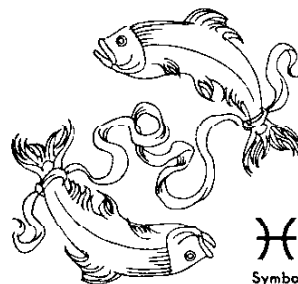
Pisceans are intelligent and friendly. They have a keen awareness of other people's moods. Pisceans lack the ability to commit themselves to a long-term course of action. They often drift from one interest or project to another.

CHRISTOPHER MCINTOSH

See also **ASTROLOGY**; **HOROSCOPE**; **ZODIAC**.

WORLD BOOK Illustration by Robert Kay

Pisces—The Fishes



Symbol

Birth dates: Feb. 19—Mar. 20.

Group: Water.

Characteristics: Emotional, friendly, imaginative, intelligent, sensitive, vague.

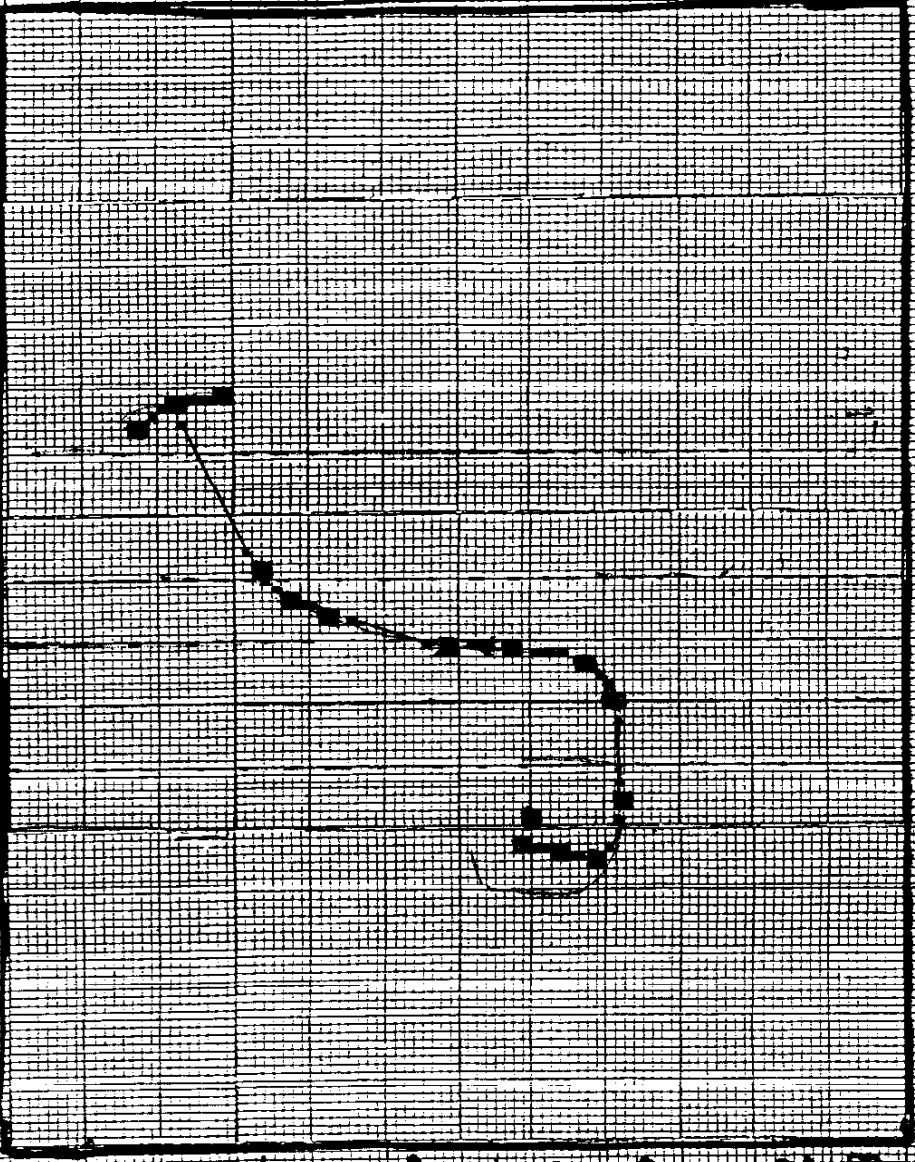
Signs of the Zodiac

Aries	Mar. 21—Apr. 19
Taurus	Apr. 20—May 20
Gemini	May 21—June 20
Cancer	June 21—July 22
Leo	July 23—Aug. 22
Virgo	Aug. 23—Sept. 22
Libra	Sept. 23—Oct. 22
Scorpio	Oct. 23—Nov. 21
Sagittarius	Nov. 22—Dec. 21
Capricorn	Dec. 22—Jan. 19
Aquarius	Jan. 20—Feb. 18
Pisces	Feb. 19—Mar. 20

17

SCORPIUS
the scorpion

15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100



15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

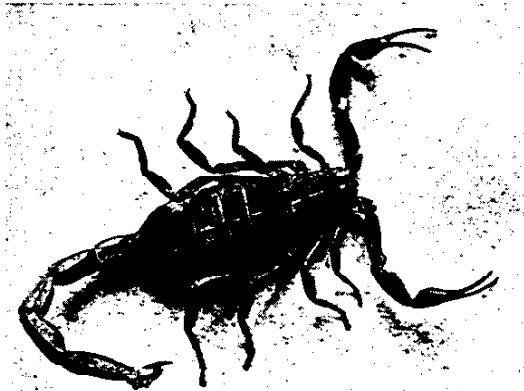
SCOPOLAMINE, *skoh PAHL uh meen*, is a drug used as a sedative, to quiet a person and cause drowsiness. It is an alkaloid and is sometimes called *hyoscine* (see **ALKALOID**). Doctors use it to control acute excitement, delirium tremens, and tetanus. It increases the quieting effect of morphine. These two drugs were formerly popular to produce "twilight sleep" in childbirth. They lessened the pain and erased memory of the event. Scopolamine has also been used in remedies for seasickness and airsickness. The effects of the drug resemble those of atropine, especially when given in doses large enough to be poisonous (see **ATROPINE**). But small doses of scopolamine have a sedative action, whereas atropine causes excitement.

AUSTIN SMITH

SCORIA. See **NORTH DAKOTA** (Land Regions); **ROCK** (Extrusive Rocks).

SCORPIO is the eighth sign of the zodiac. Its symbol is a scorpion. Astrologers believe that Scorpio is ruled by the planet Mars, which they consider a forceful, violent planet. Scorpio is a water sign.

Astrologers consider people born under the sign of Scorpio, from October 23 to November 21, to have the



Cornelia Clarke

The Scorpion is common in the southwestern part of the United States. It stings its prey and sucks the body juices.

A scorpion's body has two parts. Its short and thick forward part, called the *cephalothorax*, consists of the head and chest (thorax), which join together. The hind part is the long abdomen. Its last six segments form a slender tail. Most scorpions are black or yellowish and from $\frac{1}{2}$ to 8 inches (1.3 to 20 centimeters) long.

The scorpion has six pairs of jointed appendages. The first pair are tiny pincers, not visible in the accompanying illustration. The second pair, also a mouth part, have large claws, used to seize and crush prey. The last four pairs are leg parts. There are 6 to 12 eyes—different kinds of scorpions have different numbers. The breathing pores are on the abdomen.

All mother scorpions produce their young alive. The newly born young stay with the mother several days, and cling to her body with their tiny pincers.

Scorpions eat large insects and spiders, and are most active at night. The scorpion's sting is a curved organ at the end of its tail. Two glands at the base give out a poison that flows from two pores. A scorpion wound is painful, but does not usually cause death. The poison should be sucked or squeezed out of the wound, and the spot should be bathed with ammonia.

Scientific Classification. Scorpions belong to the class *Arachnida*, order *Scorpionida*. The families of scorpions include *Buthidae* and *Chactidae*.

EDWARD A. CHAPIN

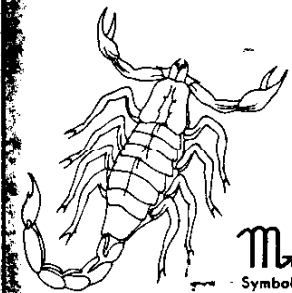
SCORPION FLY is a small insect with long wings. The male has two slender, pincerlike growths on the end of its body. These growths look like the scorpion's sting. It is not a true fly because it has four wings instead of two. The scorpion fly is about $\frac{1}{2}$ inch (13 millimeters) or more in length, and its two pairs of wings are netted and as long as its body. The pincers can be used to clasp objects, but they are not a stinging organ. Both adults and larvae feed on dead or dying insects. The adults also eat some vegetable matter. They lay their eggs in cracks in the ground. The larvae, which resemble caterpillars, hatch in about a week and grow rapidly. However, not much is known about the life cycle.

Scientific Classification. The scorpion fly is in the scorpion fly family, *Panorpidae*. A common scorpion fly is genus *Panorpa*, species *P. nebulosa*.

DALE W. JENKINS

SCORPIUS. See **ANTARES**; **ASTRONOMY** (illustration: Skies of the Seasons).

Scorpio—The Scorpion



Symbol

Birth dates: Oct. 23—Nov. 21.

Group: Water.

Characteristics: Aggressive, intense, moody, passionate, secretive, quick-tempered.

Signs of the Zodiac

Aries
Mar. 21—Apr. 19
Taurus
Apr. 20—May 20
Gemini
May 21—June 20
Cancer
June 21—July 22
Leo
July 23—Aug. 22
Virgo
Aug. 23—Sept. 22
Libra
Sept. 23—Oct. 22
Scorpio
Oct. 23—Nov. 21
Sagittarius
Nov. 22—Dec. 21
Capricorn
Dec. 22—Jan. 19
Aquarius
Jan. 20—Feb. 18
Pisces
Feb. 19—Mar. 20

WORLD BOOK illustration by Robert Keys

characteristics of Mars. Scorpions are aggressive and stimulated by conflict. They tend to change moods quickly, going from calm to anger and from rudeness to politeness. A fascinating personality and outstanding powers of leadership give Scorpions the respect, rather than the affection, of others. Scorpio is also ruled by Pluto, the planet of secrecy. For this reason, people born under this sign are secretive and like to investigate secrets.

CHRISTOPHER MCINTOSH

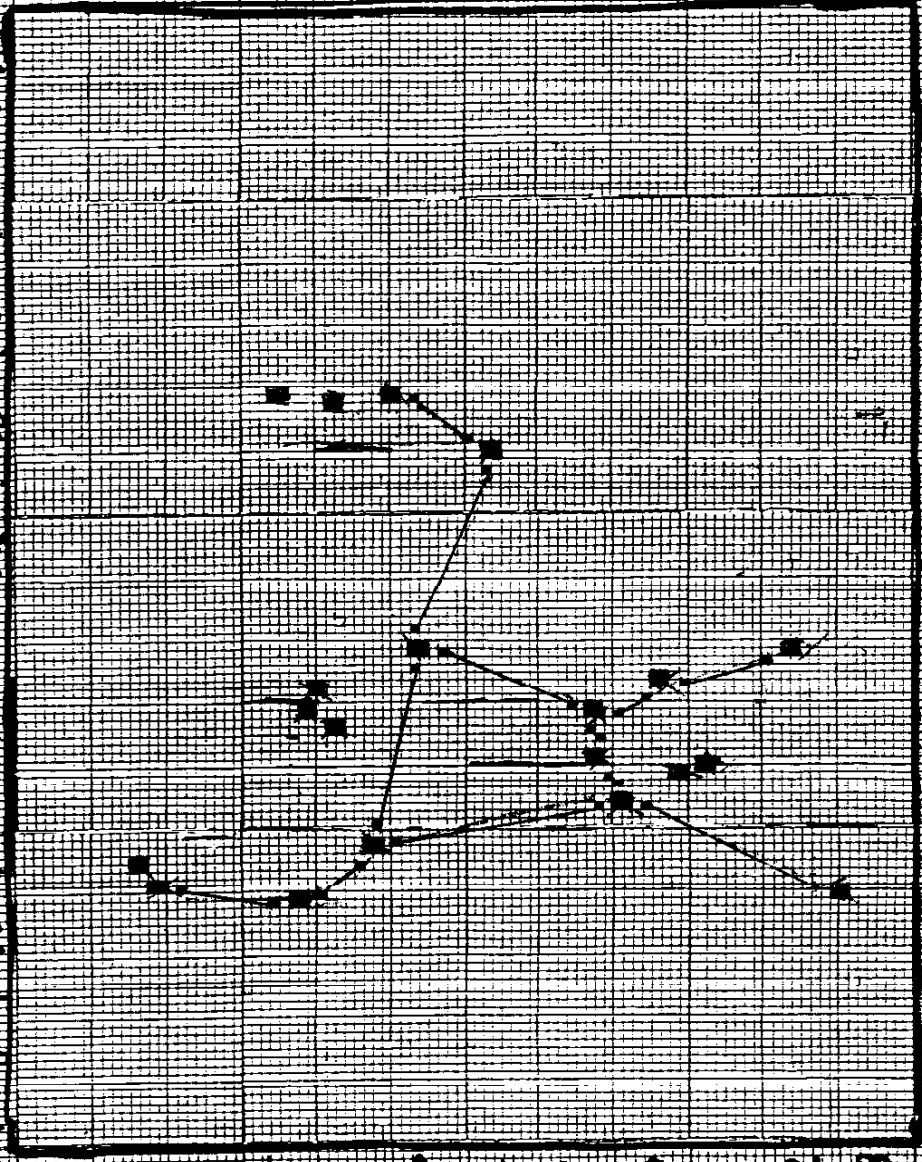
See also **ASTROLOGY**; **HOROSCOPE**; **ZODIAC**.

SCORPION, *SKAWR poo uhns*, is a small animal with a dangerous poisonous sting in its tail. Most people fear the scorpion because of its sting and ugly appearance. The scorpion is not an insect. It belongs to a class of animals called *arachnids*. Spiders, mites, and ticks also belong to this class. Scorpions live in warm countries in most parts of the world. About 20 different kinds live in the United States. One of these lives as far north as Medicine Hat, Alberta, in Canada.

⑤

ORION

Handwritten notes or labels along the left edge of the constellation diagram.



- 15
- 23
- 31
- 39
- 47
- 55
- 63
- 71
- 79
- 87
- 95
- 103

ORION

related to the crows. Most of the American orioles live in or near the tropics. In Jamaica, they are known as *banana birds*. Two common species of orioles live in southern Canada and the United States—the *northern oriole* and the more southerly *orchard oriole*. The northern oriole is divided into two subspecies, the eastern *Baltimore oriole* and the western *Bullock's oriole*. Altogether there are eight species of native orioles.

Orioles have beautiful feathers and loud musical voices. They weave hanging nests, and help farmers by eating insects. But in some areas, these birds may eat ripening grapes. Some orioles are also called *troupials*.

Scientific Classification. The American oriole belongs to the icterid family, *Icteridae*. The northern oriole is genus *Icterus*, species *I. galbula*; the orchard oriole, *I. spurius*.

GEORGE E. HUDSON

See also BALTIMORE ORIOLE; BIRD (Building the Nest; pictures: Favorite Songbirds, Bird Nests, Birds' Eggs).

ORION, *oh RYE un*, was a mighty hunter in Greek mythology. He was the son of the god Poseidon, who gave him the power to walk through the sea and on its surface (see POSEIDON).

The goddess Artemis fell in love with the handsome Orion. Her brother, Apollo, did not like this, and plotted to destroy Orion. One day while Orion was swimming, Apollo walked by with Artemis. Apollo challenged her to hit the target bobbing in the water. Artemis did not know that it was the head of her lover, and killed him with her arrow. Her sorrow was great. She placed Orion in the sky as a constellation.

Another story says that Artemis killed Orion because she was jealous of his attention to Aurora. VAN JOHNSON

ORION, the Great Hunter, is a brilliant constellation that straddles the celestial equator. The red star Betelgeuse marks the right shoulder of the hunter. The star Bellatrix marks the left shoulder. The blue-white star Rigel, at the southwest corner of the constellation, marks the giant's upraised left foot. Three bright stars mark the belt. A sword hilt, marked by faint stars, dangles from the belt. The Great Nebula of Orion, a mass of gases and dust, can be seen surrounding the center part of the sword. Orion faces the constellation of Taurus, the Bull, and seems to be warding off the bull's attack. He holds a club in his right hand. In his left hand, he grasps a lion's skin, which he can use as a shield. I. M. LEVITT

See also ASTRONOMY (Skies of the Seasons); BETELGEUSE; RIGEL; STAR (picture: Possible New Stars).

ORISKANY, BATTLE OF. See SAINT LEGER, BARRY.

ORITHYIA. See BOREAS.

ORIZABA, *ohr uh ZAH buh* (pop. 92,517), is a resort and cotton-milling city in southern Mexico. It lies 65 miles (105 kilometers) southwest of Veracruz. For location, see MEXICO (political map). The city has cotton

and jute mills, cigar factories, railroad-repair shops, a brewery, and a paper mill. The Spaniards founded Orizaba in the 1550's.

JOHN A. CROW

ORIZABA, or CITLALTÉPETL (SEE *tiah' TAY' pehl'*) is the highest mountain in Mexico, and the third highest in North America. It rises 18,701 feet (5,700 meters) above sea level about 30 miles (48 kilometers) north west of the city of Orizaba.

ORKNEY ISLANDS lie north of the British Isles. The Pentland Firth, 6 miles (10 kilometers) wide, separate them from Scotland (see GREAT BRITAIN [physical map]). The group has 67 islands and some rocky islets. They cover 377 square miles (976 square kilometers) and have a total coastline of about 100 miles (160 kilometers). People live on 25 of the islands.

The principal islands of the group are Mainland (Pomona), Hoy, North and South Ronaldsay, Flotta Burray, Rousay, Shapinsay, Stronsay, Eday, Westray and Sanday. Warm ocean currents give the islands a mild climate, and the soil is fertile.

About 17,000 persons live in the Orkneys. Most of them are of Scandinavian and Scottish descent. Agriculture and fishing are the chief occupations. The farmers grow barley, oats, turnips, and potatoes. Livestock, sea food, poultry, and eggs are exported. The Orkneys are so far north that they have scarcely any daylight in winter and scarcely any night in summer. Thousands of tourists visit the islands. Kirkwall (the capital) and Stromness are the only towns. Both are on Mainland.

In early times, a Celtic people lived on the islands and Norse explorers often visited there. In the 900's Norse earls settled and ruled the Orkneys. Scottish nobles replaced them in 1231, but the islands remained under the kings of Norway and Denmark. About 1468 the Orkneys were promised to Scotland as security for the dowry of Princess Margaret of Denmark, engaged to marry James III of Scotland. The dowry was never paid, and Scotland took the islands in 1472.

The islands are an important naval base. Scapa Flow, an enclosed anchorage that lies south of Mainland served as the base of the British Grand Fleet during World War I.

FREDERICK G. MARCHAL

ORLANDO. See ROLAND.

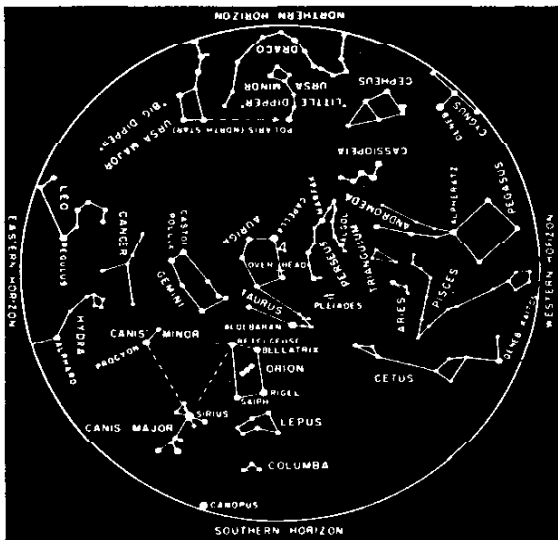
ORLANDO, Fla. (pop. 99,006; met. area pop. 453,270), is a popular winter resort and tourist center. Orlando's warm climate has helped make it one of the fastest-growing cities in the United States. Walt Disney World opened about 15 miles (24 kilometers) southwest of the city in 1971. This famous entertainment center has contributed greatly to Orlando's rapid growth. Many people, including large numbers of retired citizens, have settled in Orlando because of the mild climate. Orlando's temperature averages 60° F. (16° C) in January and 83° F. (28° C) in July.

Orlando, the county seat of Orange County, covers 43 square miles (111 square kilometers) in central Florida (see FLORIDA [political map]). Museums in the city include the Central Florida Museum and Planetarium and the Orange County Historical Museum. Orlando is the home of Florida Technological University.

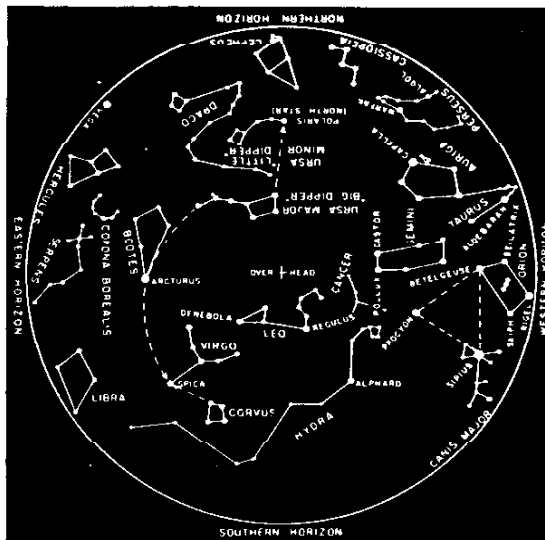
Walt Disney World is Orlando's chief employer. Other major employers include Martin Marietta, an aerospace firm; and the Orlando Naval Training Center. Orlando is the commercial center of a large fruit-growing area.



Orion



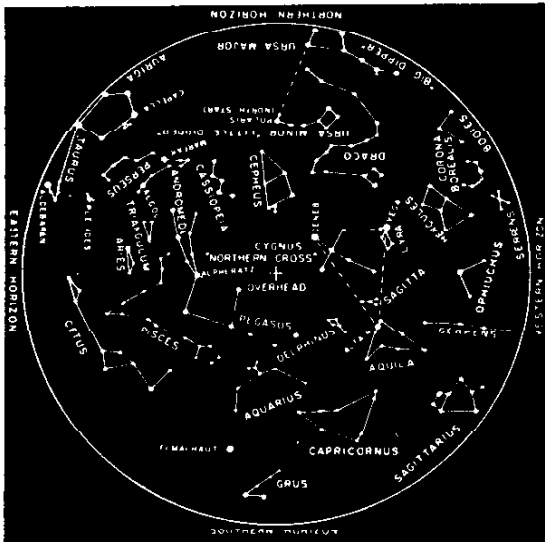
The Stars at
 11 P.M., Dec. 15;
 9 P.M., Jan. 15;
 7 P.M., Feb. 15.



The Stars at
 11 P.M., March 15;
 9 P.M., April 15;
 7 P.M., May 15.



The Stars at
 11 P.M., June 15;
 9 P.M., July 15;
 7 P.M., Aug. 15.



The Stars at
 11 P.M., Sept. 15;
 9 P.M., Oct. 15;
 7 P.M., Nov. 15.

The night sky throughout the year.

- | | |
|------------|--------|
| SCORPIUS | TAURUS |
| BOOTES | CORVUS |
| CAPITEUS | ORION |
| CASSIOPEIA | |
| AQUARIUS | |
| ARIES | |
| PISCES | |