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# How to use the MICROPAEDIA

The 12 volumes of the MICROPAEDIA contain tens of thousands of shorter articles on specific persons, places, things, and ideas, arranged in alphabetical order. The MICROPAEDIA can be used as an information resource on its own; and it can function as support for the longer articles in the MACROPAEDIA (to which it refers whenever appropriate). The MICROPAEDIA in turn is supported by references in the INDEX and by the lists of suggested readings in the PROPAEDIA. Finally, the MICROPAEDIA is the portion of the *Encyclopædia Britannica* best suited for the reader who wishes to browse among the countless subjects in all fields of human learning and history in all times and places.

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## Alphabetization

Entry titles are alphabetized according to the English alphabet, A to Z. All diacritical marks (such as in ö, ð, or ñ) and foreign letters without parallels in English (such as ayin [ʾ] and hamza [ʔ]) are ignored in the alphabetization. Apostrophes likewise are ignored. Titles beginning with numbers, such as **1812, War of**, are alphabetized as if the numbers were written out (**Eighteen-twelve, War of**).

Alphabetization proceeds according to the “word-by-word” principle. Thus, **Mount Vernon** precedes **mountain**; any **John** entry precedes **John Henry**, which in turn precedes **Johne’s disease**. Any character or string of characters preceding a space, hyphen, or dash is treated as a word and alphabetized accordingly. Thus, **De Broglie** precedes **debenture**, and **jack-o’-lantern** precedes **jackal**. Titles with identical spellings are arranged in the following order: (1) persons, (2) places, (3) things.

For many rulers and titled nobility, chronological order, as well as alphabetical order, governs placement. Rulers of the same given name (e.g., William) may be grouped together, separate from other entries, and indicated by the symbol ●. They may be subgrouped alphabetically by country and, within each country, arranged chronologically (**William I, William II**, etc.). Nobility or peers of the same titled name (e.g., **Essex, EARLS OF**) are similarly grouped together, separate from other entries; they are indicated by the symbol ● and arranged chronologically.

Places with identical names are arranged in the alphabetical order of the countries where they are located. Identical place-names in the same country are alphabetized according to the alphabetical order of the state, province, or other political subdivision where they are found.

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## Entry arrangement

The titles of entries are arranged according to the forms commonly found in indexes and dictionaries, with some special conventions.

Entry titles for certain physical features, institutions, structures, events, and concepts are ordinarily inverted to place the substantive word first. Thus, the Bay of Bengal is entered as **Bengal, Bay of**; the Bank of England as **England, Bank of**; the Tower of London as **London, Tower of**; the Siege of Vienna as **Vienna, Siege of**; and the balance of power as **power, balance of**. If the name of a physical feature, institution, structure, event, or concept has two or more descriptors, it is entered under the descriptor appearing first. Thus, the Episcopal Church in Scotland is entered as **Episcopal Church in Scotland** (not **Scotland, Episcopal Church in**); the Leaning Tower of Pisa as **Leaning Tower of Pisa**; and the kinetic theory of gases as **kinetic theory of gases**.

The entries for most Western persons are arranged so that one can read a name in correct order by beginning after the first comma, proceeding to the end of the boldface type, returning to the beginning word or words, and proceeding forward to the first comma. Thus, the entry **March, Patrick Dunbar, 2nd Earl of**, is read “Patrick Dunbar, 2nd Earl of March”; the entry **Orléans, Louis, duc d’**, is read “Louis, duc d’Orléans.” Names of Far Eastern origin are given in Oriental order, with the surname preceding the personal name (e.g., **Tojō Hideki, Deng Xiaoping, Nguyen Cao Ky**).

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## Cross-references

Some cross-reference entries appear in the MICROPAEDIA for the purpose of leading a reader from names that are familiar to alternate names that may not be. Cross-references also appear frequently within or at the ends of standard entries, where they are identified by *see*, *see also*, *see under*, *q.v.* (*quod vide*, “which see”), or *qq.v.* (*quae vide*, “which see,” plural).

Certain entries serve both as relatively brief essays on general subjects and as cross-references to the same subjects treated at greater length and in greater depth in the MACROPAEDIA. Such an entry (e.g., **igneous rock**) begins with a definition of the subject and then provides the following cross-reference: “A brief treatment of igneous rocks follows. For full treatment, *see* MACROPAEDIA: Minerals and Rocks.”

Entries on certain broad subjects (e.g., **music**) direct the reader to several relevant articles in the MACROPAEDIA and also to the PROPAEDIA for listings of related articles in the MICROPAEDIA.

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## Abbreviations

Abbreviations used in the MICROPAEDIA are given in a list that appears at the end of every MICROPAEDIA volume.

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## Territorial boundaries

In articles and maps indicating disputed geopolitical boundaries and territories, the attribution of sovereignty or administrative subordination to any specific area does not imply recognition of the status claimed by an administering power.



**Trudeau, Pierre Elliott** (b. Oct. 18, 1919, Montreal), Liberal politician and prime minister of Canada (1969–79; 1980–84). His terms in office were marked by the establishment of diplomatic relations with China (1970) and improved relations with France, the defeat of the French separatist movement, independence from the British parliament, and the formation of a new Canadian constitution with the principal additions of a bill of rights and an amending formula.

Trudeau grew up in a family of French and Scots-French descent, in the affluent Montreal suburb of Outremont. He studied at Jean-de-Brébeuf, an elite Jesuit preparatory school, and at the University of Montreal, from which he received a law degree in 1943. He served on the Privy Council for three years as a desk officer, and in 1950 he helped found the *Cité Libre* ("Free City"), a monthly critical review. He practiced law from 1951 to 1961, specializing in labour and civil liberties cases.

Trudeau was assistant professor of law at the Université de Montréal from 1961 to 1965, when he was elected as a "new wave" Liberal to the House of Commons. In 1967 he toured the French-speaking African nations on behalf of the prime minister, Lester B. Pearson, who had appointed him parliamentary secretary (1966) and minister of justice and attorney general. As minister of justice, Trudeau won passage of three unpopular social welfare measures—stricter gun-control legislation and reform of the laws against abortion and homosexuality.

On Pearson's announcement of his plan to retire, Trudeau campaigned for the leadership of the Liberal Party. His colourful personality and disregard of unnecessary formality, combined with his progressive ideas, made him the most popular of the 20 candidates. He became party leader on April 6, 1968, and prime minister two weeks later. As a determined anti-separatist, Trudeau in 1970 took a strong stand against terrorists from the Front de Libération du Québec.

The elections of October 1972 left Trudeau and the Liberals much weakened, with a minority government dependent on the coalition support of the New Democratic Party (NDP). During the next year and a half the Prime Minister faced a series of no-confidence votes in Parliament, but in the national elections on July 8 the Liberal Party won a clear majority and an increased number of seats in Parliament.

Throughout the 1970s, Trudeau struggled against increasing economic and domestic problems. In the national general elections of May 22, 1979, his Liberal Party failed to win a majority (although Trudeau maintained his seat in Parliament), and the Progressive Conservative Party won power as a minority government.

The Liberal Party was returned to power in the general election of Feb. 18, 1980, and Trudeau began his fourth term as prime minister on March 3. The proposal of French separatism in Quebec was defeated in a provincial referendum on May 20, 1980, and Trudeau then began work on his plans to reform Canada's constitution. Proposed reforms included "patriation" (i.e., that the British Parliament transfer the authority to amend Canada's constitution to Canada), a charter of human rights, broadened federal economic powers, and institutional changes in federal structures such as the Supreme Court.

On Dec. 2, 1981 the Canadian House of Commons approved Trudeau's constitutional reform resolution with a vote of 246 to 24 (only the representatives from Quebec dissented), and on April 4, 1982, Queen Elizabeth II of England declared Canada's independence from the British Parliament. With these major political aims realized, Trudeau spent his final years in office seeking greater economic in-

dependence for Canada, forming better trade relations between industrialized democracies and Third World nations, and urging further international disarmament talks. On Feb. 29, 1984, Trudeau resigned from the leadership of the Liberal Party, but he remained in office until a successor could be chosen at the party leadership convention in June of that same year.

Trudeau's publications include *La Fédéralisme et la société Canadienne-Française* (1967; *Federalism and the French Canadians* 1968), *Les Cheminements de la politique* (1970; *Approaches to Politics*), and *Conversations with Canadians* (1972).

**True Cross**, Christian relic, reputedly the wood of the cross on which Jesus Christ was crucified. Legend relates that the True Cross was found by St. Helena, mother of Constantine the Great, during her pilgrimage to the Holy Land about 326.

The earliest historical reference to veneration of the True Cross occurs in the mid-4th century. By the 8th century the accounts were enriched by legendary details describing the history of the wood of the cross before it was used for the Crucifixion.

Adoration of the True Cross gave rise to the sale of its fragments which were sought as relics. John Calvin pointed out that all the extant fragments, if put together, would fill a large ship, an objection regarded as invalid by some Roman Catholic theologians who claimed that the blood of Christ gave to the True Cross a kind of material indestructibility, so that it could be divided indefinitely without being diminished. Such beliefs resulted in the multiplication of relics of the True Cross wherever Christianity expanded in the medieval world, and fragments were deposited in most of the great cities and in a great many abbey. Reliquaries designed to hold the fragments likewise multiplied, and some precious objects of this kind survive.

The desire to win back or obtain possession of the True Cross was claimed as justification for military expeditions, such as that of the Byzantine emperor Heraclius against the Persians (622–628) and the capture of Constantinople by the crusaders in 1204.

The Feast of the Finding of the Cross was celebrated in the Roman Catholic Church on May 3 until it was omitted from the church calendar in 1960 by Pope John XXIII.

**true water beetle:** see predaceous diving beetle.

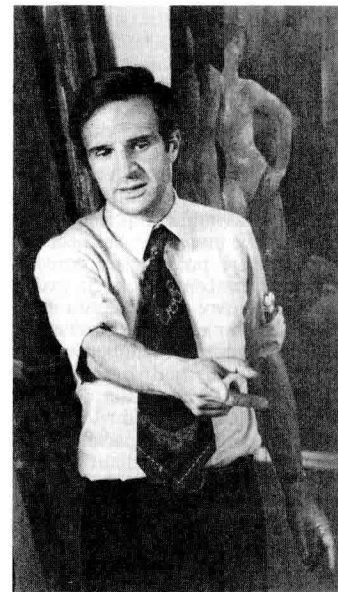
**Truffaut, François** (b. Feb. 6, 1932, Paris—d. Oct. 21, 1984, Neuilly-sur-Seine, near Paris), French film critic and producer whose attacks on established filmmaking techniques paved the way for the movement known as the Nouvelle Vague (New Wave). His major films include *Les Quatre Cents Coups* (1959; *The 400 Blows*), *Tirez sur le pianiste* (1960; *Shoot the Piano Player*), *Jules et Jim* (1961; *Jules and Jim*), *Baisers volés* (1968; *Stolen Kisses*), *L'Enfant sauvage* (1970; *The Wild Child*), *L'Histoire d'Adèle H.* (1975; *The Story of Adèle H.*), and *Le Dernier Métro* (1980; *The Last Metro*).

**Early works.** Truffaut was born into a working-class home. His own troubled childhood provided the inspiration for *Les Quatre Cents Coups* a semi-autobiographical study of a working-class delinquent. It is the first of the Antoine Doinel trilogy, tracing its hero's evolution from an antisocial anguish to a happy and settled domesticity. When it won the "best direction" prize at the 1959 Cannes Festival, Truffaut was established as a leader of the French cinema's *Nouvelle Vague* (New Wave)—a term for the simultaneous presentation of first feature films by a number of French directors—a tendency that profoundly influenced the rising generation of filmmakers around the world. The New Wave marked

a reaction against the commercial production system: the well-constructed plot, the limitations of a merely craftsmanlike approach, and the French tradition of quality with its heavy reliance on literary sources. Its aesthetic theory required every detail of a film's style to reflect its director's sensibility as intimately as a novelist's prose style retraces the workings in depth of his mind—hence the phrase *le camera-stylo* ("camera-pen"). The emphasis lay on visual nuance, for, in keeping with a general denigration of the preconceived and the literary, the script was often treated less as a ground plan for a dramatic structure than as merely a theme for *alfresco* improvisation. Improvised scenes were filmed, deploying the visual flexibility of newly developed television equipment (e.g., the handheld camera) and techniques (e.g., extensive postsynchronization of dialogue). The minimization of costs encouraged producers to gamble on unknown talents, and the simplicity of means gave the director close control over every aspect of the creative process, hence Truffaut's term *auteur*, or film author.

Outside his art, Truffaut was reticent about his private life, although it is known that he was sent to a reformatory before leaving school at the age of 14 to work in a factory. His interest in the cinema, however, brought him to the attention of the critic André Bazin, doyen of the monthly avant-garde film magazine *Cahiers du Cinéma*, who incorporated him into the staff. For eight years Truffaut asserted himself as the most truculent critic of the contemporary French cinema, which he considered stale and conventional, and advocated a cinema that would allow the director to write dialogue, invent stories, and, in general, produce a film as an artistic whole in his own style. Thus, he was influential in the cinema world before he actually made a film. Like his leading character in *Baisers volés*, another film in the Doinel series, he deserted from his military service, being committed to various prisons until he was able to resume his journalistic career and, eventually, put his ideas into creative practice. Again like Doinel in *Domicile conjugal* (1970; *Bed and Board*), he married and became the father of two daughters.

Truffaut's initial creative effort, the short piece *Les Mistons* (1958; *The Mischief Makers*), depicted a gang of boys who thought-



Truffaut on the set of *Les Deux Anglaises et le Continent*, 1971

By courtesy of Les Films du Carrosse

lessly persecute two young lovers. His second short, *Une Histoire d'eau* (1959; "A Story of Water"), was a slapstick comedy for which Jean-Luc Godard developed the conclusion. Both films met with sufficient appreciation to facilitate his first feature-length film, *Les quatre cents coups*. An evocation of the adolescent's pursuit of independence from a staid adult world of conformity and protocol, for which Truffaut evinced a romantic sympathy, the film proved to be one of the most popular New Wave films, especially in England and the United States. Two tenderly pessimistic studies in sexual tragedy followed, *Tirez sur le pianiste*, adapted from the U.S. thriller *Down There* by David Goodis, a genre for which Truffaut evinced great admiration, and *Jules et Jim*.

**Later works.** After this burst of creativity he seemed to have a period of hesitation. All of his later works, however, were intensely personal and explored one of two themes: studies in forlorn childhoods—e.g., *The Doinel trilogy* and *L'Enfant sauvage*, the chronicle of an 18th-century doctor who attempts to domesticate an uncivilized child—and sensitive melodramas sadly celebrating disastrous confrontations between shy heroes and boldly emancipated or possessive women. The first theme shows the influence of filmmaker Jean Vigo, in its uncompromising stance against authority of any kind, and of Jean Renoir, in its feeling for place and atmosphere and its mingling of the nostalgic with sudden outbursts of blatant humour, as well as of Truffaut's personal experience. The second owes much to the American *roman noir*, or "black novel," the diverse manifestations of which, from the morally disintegrated heroes of William Faulkner to the sadistic gangsters of Mickey Spillane, have fascinated French novelists from Jean Paul Sartre to the present. A certain hero worship, also, is discernible in Truffaut's long, published conversations with the veteran British-American filmmaker Alfred Hitchcock, whose work he admired in complete defiance of his earlier theories. Of Truffaut's features only *Fahrenheit 451* (1966), a film version of Ray Bradbury's science-fiction novel, falls outside these categories, though it relates to the American style and the poetic-melodramatic form. Through his production company, Les Films du Carrosse, Truffaut coproduced, among other films, Godard's first feature and Jean Cocteau's last. His own later films include *Domicile conjugal*, *La nuit américaine* (1972; *Day for Night*), for which he was awarded an Oscar by the Academy of Motion Picture Arts and Sciences; and *Le Dernier Métro* and *Vivement Dimanche* (1983; "Lively Sunday").

For Truffaut, the cinema had to be, on the one hand, personal and, on the other, a splendid spectacle. The style of his first three films, at once delicate, lyrical, and exceptionally fertile in cinematographic invention, has become, partly by choice, more prosaic and conventional. Controversy has centred on the extent to which his films involve a militant conservatism—whether, for example, Truffaut in *L'Enfant sauvage* deplores, documents, feels nostalgic for, or positively and without reservation approves the narrow, strict rigidities with which its psychologist (played by Truffaut himself) sets about civilizing the abandoned, autistic child. It may be that Truffaut's earlier inspiration was rooted in the nostalgias and despairs of his childhood, and as with success he matured into adult and father, so his films lost in lyricism, while maintaining their fidelity to life's prosaic side. But life's grayness and flatness was recorded with a sense of resignation and quiet achievement quite distinct from platitude or petulant nihilism.

(R.Du./Ed.)

**BIBLIOGRAPHY.** Graham Petrie, *The Cinema of François Truffaut* (1970); C.G. Crisp, *François Truffaut* (1972); James M. Wall (ed.), *Three European Directors* (1973); Don Allen, *François Truffaut* (1974); and Annette Insdorf, *François Truffaut* (1978), are interesting book-length studies. See also Truffaut's *Hitchcock* (1967), and *The Films in My Life* (1978). Scripts that have been translated into English include *Jules and Jim* (1968), *The 400 Blows* (1969), *The Wild Child* (1973), *Day for Night* (1975), and *The Story of Adele H.* (1976). *Small Change* (1976) is a novelization of the film *L'Argent de poche* (1976; *Small Change*).

**truffle**, edible, subterranean fungus prized as a food delicacy from classical times. Truffles are in the genus *Tuber*, order Tuberales, of the class Ascomycetes (division Mycota). They are native mainly to temperate regions. The different species range in size from that of a pea to that of an orange.

A section of a young specimen shows a whitish homogeneous flesh that with age becomes a rich dark colour showing a lighter marbling. Truffles flourish in open woodland on calcareous soil. They are saprophytes, usually associated with the roots of trees, possibly



English truffle (*Tuber aestivum*)  
S.C. Porter—Bruce Coleman Inc.

in a mutually beneficial association (see mycorrhiza). The spores of *Tuber* are large; from one to four may be seen in a spore sac, or ascus. (These, the first ascospores to be observed, were described by the French botanist Joseph Pitton de Tournefort in 1701–11.)

The most valued truffle in French cookery is the Périgord (*T. melanosporum*), which is said to have first gained favour toward the end of the 15th century. It is brown or black, rounded, and covered with polygonal warts having a depression at their summit; the flesh (gleba) is first white, then brown or gray, and when mature becomes black with white veins having a brown margin. The odour is well marked and pleasant. The main French *truffières* (truffle grounds) are in Périgord and the *département* of Vaucluse, though truffles are gathered throughout a large part of France.

The truffle industry is an important one in France, and about one-third of the gatherings are exported. The French government undertook the reforestation of many large and barren areas, for many of the best truffle regions become productive by the planting of trees, particularly oaks. Because truffles often occur at depths of up to about 30 centimetres (12 inches), it is difficult to detect them unaided. Truffles, when occurring near the surface of the ground, crack it as they reach full size, and experienced gatherers can detect them. Furthermore, in the morning and evening columns of small yellow flies may be seen hovering over a colony. Occasionally an individual is sufficiently sensitive to the scent of truffles to locate them, but truffle hunting is usually carried on with the aid of trained pigs and dogs.

Although truffles are much desired as food, direct cultivation of truffles for commerce is difficult. Calcareous ground is dug over and acorns or seedlings planted. Soil from truffle areas is usually spread about, and the ground

is kept in condition by light plowing and harrowing. After three years, clearings are made and the trees pruned. If they are to appear, truffles do so only after about 5 years; gathering begins then, but is not very profitable until 8 or 10 years have passed. The yield is at its maximum from 5 to 25 years later.

The English truffle, *T. aestivum*, is found principally in beech woods. It is bluish black, rounded, and covered with coarse polygonal warts; the gleba is white when immature, then yellowish, and finally brown with white branched markings.

Truffles are rare in North America, being found most often in Oregon and California. False truffles (*Rhizopogon*), form small, underground, potato-like structures under coniferous trees, in parts of North America.

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**Trujillo**, capital, Colón department, northeastern Honduras, on Trujillo Bay, sheltered from the Caribbean Sea by Cape Honduras. Founded in 1524, the historic city was the first capital of the Spanish colonial province of Honduras, flourishing especially in the early 17th century. In 1531 it was made a bishop's see, but that office was removed to Comayagua in 1561. Dutch pirates sacked Trujillo in 1643; it lay in ruins until it was resettled by Galicians in 1787. William Walker, the U.S. filibuster who attempted to conquer Honduras, was shot nearby in 1860. The town never regained its 17th-century prominence, though it is a commercial centre and exports bananas, coconuts, mahogany, and hides. Since 1920 it has lost most of its port trade to Puerto Castilla to the north. In the 1970s a fishing industry developed, and a packing and refrigeration plant was built. A sawmill also has opened, processing lumber for export. Tourism has grown in importance because of fine beaches nearby. Trujillo is accessible by air, and highways link the city with the north-coast cities and also with Olancho department. Pop. (1983 est.) 34,835.

**Trujillo**, capital of Trujillo province and La Libertad department, Peru, lying in the coastal desert, 343 mi (552 km) north-northwest of Lima.

The second oldest Spanish city in Peru, Trujillo was founded in 1534 by Diego Almagro;



The cathedral at Trujillo, Peru  
Walter Aguilar—EB Inc.

the following year it was elevated to city status by the conquistador Francisco Pizarro, who named it after his birthplace in Spain. It sustained heavy damage from an earthquake in 1612. Following 19th-century foreign investment in sugarcane plantations, Trujillo's population swelled, until it became one of Peru's largest cities.

The irrigated lands of the surrounding Río Moche Valley produce sugarcane and rice. The city's industries include sugar refineries, knitting mills, and breweries. Trujillo is on the Pan-American Highway and is linked by



road to inland communities and nearby beach resorts. The city has an airport and is connected to major agricultural areas and its seaport of Salaverry by rail. Trujillo is the site of the National University of Trujillo (1824) and an archaeological museum. The ruins of Chan Chan, capital of the pre-Inca Chimú empire, are situated 4 miles (6 km) west. Pop. (1990 est.) city, 532,000.

**Trujillo**, ancient (Latin) *TURGALIUM*, town, Cáceres provincia, Extremadura comunidad autónoma ("autonomous community"), western Spain, on the Tozo River, a tributary of the Tagus River. It is sited on a hill 25 miles (40 km) east of the provincial capital Cáceres. Trujillo was a town of importance in the European Middle Ages, and Francisco Pizarro, conqueror of Peru, was born there about 1475; his palace still stands, and his tomb is in the Church of Santa María de la Concepción. The town also has Roman remains, an impressive Moorish castle, and the 15th-century Gothic Church of Santa María. Trujillo is an agricultural trade and road centre, with food processing and milling. Pop. (1981) 9,445.

**Trujillo**, *estado* ("state"), northwestern Venezuela. It is bounded on the west by Lake Maracaibo and by the states of Portuguesa on the east, Mérida on the southwest, Barinas on the south, and Zulia on the north. Covered with mountains over most of its area of approximately 2,900 square miles (7,400 square km), Trujillo is one of the truly Andean states of Venezuela and ranks high agriculturally despite the restriction of cultivation largely to narrow valleys and alluvial terraces. The principal crops produced in the state include coffee, corn (maize), garlic, sesame, sugarcane, wheat, and cassava. The state capital, Trujillo, is a regional market centre for the agricultural products of the surrounding area, although in the 20th century Valera (*q.v.*) has become more important commercially and is the state's largest city. The state is served by both the Pan-American and the trans-Andean highways. Pop. (1989 est.) 543,869.

**Trujillo**, city, capital of Trujillo *estado* ("state"), northwestern Venezuela. The city lies on a northern outlier of the Cordillera de Mérida, 2,640 feet (805 m) above sea level. Founded in 1556, Trujillo was the site of the 1813 proclamation by the liberator Simón Bolívar, which promised a "fight to the death" for independence from Spain. In colonial times a thriving way station between Táchira and Mérida, it has been outstripped in size and commercial importance by Valera, which lies 12 miles (19 km) to the west-southwest. Trujillo is a market centre for a fertile agricultural region in which cacao, corn (maize), coffee, sugarcane, tobacco, and fruit are cultivated. Flour mills are among the city's industries. The Pan-American Highway passes near the city. Pop. (1987 est.) 39,387.

**Trujillo (Molina), Rafael (Leónidas)** (b. Oct. 24, 1891, San Cristóbal, Dominican Republic—d. May 30, 1961, Ciudad Trujillo, near San Cristóbal), dictator of the Dominican Republic from 1930 until his assassination in 1961.

Trujillo entered the Dominican army in 1918 and was trained by U.S. Marines during the U.S. occupation (1916–24) of the country. He rose from lieutenant to commanding colonel of the national police between 1919 and 1925, becoming a general in 1927. Trujillo seized power in the military revolt against President Horacio Vásquez in 1930. From that time until his assassination 31 years later, Trujillo remained in absolute control of the Dominican Republic through his command of the army, by placing family members in office, and by having many of his political opponents murdered. He served officially as president from 1930 to 1938 and again from 1942 to 1952. Competent in business, capable in admin-



Trujillo  
Pictorial Parade

istration, and ruthless in politics, Trujillo brought a degree of peace and prosperity to the republic that it had not previously enjoyed. However, the people of the country paid for this prosperity with the loss of their civil and political liberties, and the benefits of economic modernization were inequitably distributed in favour of Trujillo and his favourites and supporters. In spite of the harsh measures that Trujillo took to protect his power, domestic opposition continued to grow during the later years of his regime, and he also came under considerable foreign pressure to liberalize his rule. He began to lose support in the army, and this led to his assassination by machine-gun fire as he was driving to his San Cristóbal farm. Many of the supposed assassins, including General J.T. Díaz, were subsequently captured and executed.

**Truk Islands** (Micronesia): *see* Chuuk Islands.

**trullo**, plural *TRULLI*, conical, stone-roofed building unique to the *regione* of Puglia (Apulia) in southeastern Italy and especially to the town of Alberobello, where they are used as dwellings. Upon a whitewashed cylindrical wall, circles of gray stone, held in place by lateral opposition and gravity and without mortar, were piled to a pinnacle. Probably originating with a local Stone Age culture, the



Trulli in Alberobello, Italy  
Pellegrini—Grimoldi

trulli have been perpetuated as a folk tradition, possibly because of the local shortage of lumber and the abundance of stone fragments that must be removed to permit land cultivation. Trulli are protected by Italian law as national monuments.

**Trullo, Council in** (692): *see* Quinisext Council.

**Truman, Harry S.** (b. May 8, 1884, Lamar, Mo., U.S.—d. Dec. 26, 1972, Kansas City, Mo.), 33rd president of the United States

(1945–53), who led his nation into international confrontation with Soviet and Chinese communism and defended the New Deal reforms.

**Early life and career.** Truman was the son of a mule trader and farmer. He attended school in Independence, Mo., completing high school in 1901. He became a bank clerk in Kansas City; then in 1906 he took over management of his maternal grandmother's farm at Grandview. He also served as local postmaster, road overseer, and national guardsman. He became a partner in a lead mine (1915) and in an oil-prospecting business (1916); both failed.

Truman distinguished himself in heavy action as a captain in World War I, showing bravery and other qualities of leadership. On June 28, 1919, he married Elizabeth ("Bess") Wallace, an Independence girl whom he had known since childhood. He became a partner in a Kansas City haberdashery store, and, when the business failed, he entered politics with the help of Thomas Pendergast, a Democratic boss of Jackson county.



Truman, 1945  
By courtesy of the U.S. Signal Corps

With the support of Pendergast's political machine and of World War I veterans, Truman won a seat as county judge in 1922. But despite excellent work, in 1924 (the same year that his daughter, Margaret, was born) non-Pendergast Democrats combined with the Ku Klux Klan to defeat him. Truman then sold memberships in the Kansas City Automobile Club and attended night classes for two years at the Kansas City Law School. A state bank in Englewood in which he became a partner went into bankruptcy because of the fraudulent activities of its former owner, but Truman enjoyed his first business success following his organization of the Community Savings & Loan Association in Independence.

With Pendergast's backing, in 1926 he became presiding judge of the county court. As a two-term, eight-year county administrator, Truman's reputation for honesty and good management gained him Republican as well as Democratic support. Meanwhile, Pendergast was gaining dictatorial control over Jackson county; he achieved statewide power in the early 1930s, determining who would serve as Missouri's governor and as its members of the U.S. House of Representatives. That Truman was not in his inner circle was revealed in 1932 when Pendergast stifled Truman's ambition to become governor and refused to name him to the Missouri delegation to the Democratic National Convention.

In 1934 Truman's political career seemed ended because of the two-term tradition attached to his job. But the machine's gangsterism in the March municipal election, in which four persons were killed at the polls, had a direct bearing on his future. After three indi-

viduals rejected Pendergast's subsequent offer of support in the coming U.S. Senate primary contest. Truman, his fourth choice, quickly accepted. Truman was elected with the help of a suspicious machine vote in Jackson County.

Truman entered the U.S. Senate in 1935 under the cloud of being the puppet of a crooked boss. But his attention to duties and his friendly personality soon won over his colleagues. He was the author of the Civil Aeronautics Act of 1938, and his two-year committee investigation led to the Transportation Act of 1940. The outlook for Truman's reelection in 1940, however, was gloomy; the Pendergast machine lay in shambles, with Tom Pendergast in prison for having taken bribes. President Roosevelt offered Truman a face-saving place on the Interstate Commerce Commission, but he stubbornly ran for another term even though newspapers rated him a distant third in a three-man primary race. Yet because of the last-minute support of Robert E. Hannegan, a young St. Louis Democratic subboss, Truman won by a slender margin.

The nation's growing defense and then war production programs soon launched Truman into his major senatorial endeavour. His Special Committee Investigating National Defense exposed a long list of graft, waste, and product deficiencies and brought him public praise. At the same time, he used his expanding patronage power to reward Hannegan with a series of appointments. The advancement of Hannegan to chairman of the Democratic National Committee in January 1944 led to a successful effort to have Pres. Franklin D. Roosevelt replace Vice Pres. Henry A. Wallace with Truman on the victorious 1944 presidential ticket. Truman's vice presidency lasted only 82 days, during which time he met with Roosevelt only twice and had little knowledge of the administration's programs and plans.

*Succession to the presidency.* Roosevelt died on April 12, 1945. Truman was a month away from his 61st birthday when he took the presidential oath of office. Vital decisions had to be made at a relentless pace, despite his lack of tutelage. In swift order he made final arrangements for the San Francisco charter-writing meeting of the United Nations (UN), helped arrange Germany's unconditional surrender on May 8, and went in July to his first and only summit meeting, at Potsdam, Ger., for inconclusive talks about a peace settlement. The Pacific war ended officially on September 2, after atomic bombs had been dropped on the Japanese cities of Hiroshima and Nagasaki following Truman's orders. His justification for the bombings was a report from advisers that 500,000 Americans would be lost in an invasion of Japan.

Truman enjoyed a five-month honeymoon with Congress, which ended in September 1945 when he submitted his "Economic Bill of Rights," which included social reforms that he hoped would head off a return to economic depression. The developing vocal opposition, added to public weariness over meat shortages and inflation and the defection of Roosevelt admirers when Truman installed his own choices in his Cabinet, combined to give Republicans control of Congress in 1946.

Two years later many Democratic leaders believed Truman could not win election and demanded that he retire. But the 1948 convention nominated him, with Sen. Alben W. Barkley as his running mate. All public opinion polls showed that the New York governor Thomas E. Dewey, the Republican nominee, would be an easy winner. Undaunted, Truman carried out a "give 'em hell" campaign, repeatedly denouncing the "Republican do-nothing 80th Congress." In November he upset a complacent Dewey by a 114-electoral-vote margin.

In his State of the Union message in 1949, Truman proposed the Fair Deal, a liberal 24-plank domestic program. But despite his efforts, only a single plank was enacted into law—a low-cost public housing measure. He fared much better in foreign affairs, however, where he considered the Soviet Union the principal roadblock to world peace. To restrict Soviet territorial advances and spreading spheres of influence, he developed a "containment" policy, thus setting the course of U.S. foreign policy for decades to come.

Among his Cold War moves were the Truman Doctrine of economic and military aid to Greece and Turkey in 1947 to reduce Communist pressures on their governments; the four-year \$17,000,000,000 Marshall Plan of 1948 for economic recovery in western Europe; and the North Atlantic Treaty Organization (NATO) pact of 1949, a collective security agreement with non-Communist European nations. When China came under Communist control in 1949, Truman's containment policies were extended to include that giant nation. He also established the Central Intelligence Agency (CIA) in 1947, initiated the Berlin airlift of 1948 to bring supplies into the former German capital when the Soviets blocked surface entrances, instituted the Point Four Program of 1949 to provide aid to underdeveloped countries, and decided in 1950 to construct the hydrogen bomb in order to maintain an arms lead over the Soviets, who had recently exploded an atomic bomb.

*Outbreak of the Korean War.* In June 1950 Communist North Korea crossed the 38th parallel boundary and attempted to seize South Korea. Truman sent U.S. forces to Korea under Gen. Douglas MacArthur with UN sanction. Once MacArthur had liberated the south, the administration ordered the capture of North Korea; but MacArthur's advance to the Yalu River boundary with Manchuria brought hundreds of thousands of Chinese Communist troops into the fighting. MacArthur's insistence on attacking China as well forced Truman to fire him.

The unpopularity of the continuing war and the uncovering of unsavoury and fraudulent activities by several federal officials made Truman's last two years in office appear chaotic. A further decline of confidence in the government was brought on by the charges of Sen. Joseph R. McCarthy of Wisconsin that the State Department and other agencies were Communist-controlled.

After Truman left office in January 1953 and returned to Independence, his popularity soared. And with the perspective of passing years the haze surrounding his presidency lifted. What remained was a man who had generally succeeded in his foreign policy and a president who, as Harry Truman himself once put it, had "done his damndest." His life in retirement was modest but active, perhaps epitomized by his habit of the brisk morning walk, or "constitutional," which he maintained for as long as his health permitted.

In a comparison of U.S. presidents, Harry S. Truman must be judged one of the strongest. Yet during his term of office his reputation was that of a man far too small for his job. Compared unfavourably by northern Democrats with his popular predecessor, Franklin D. Roosevelt, condemned by Southern Democrats for his liberal civil rights program, and at war with Republican isolationists and economic conservatives, Truman spent a turbulent period in office. But after his term, the significance of his efforts slowly became evident, especially his foreign policy goal of containing Communist expansion and his largely unsuccessful programs of social and economic reforms to raise standards of living for workers and farmers and to broaden civil rights for minorities; his continual pursuit of these goals kept them viable for future action.

He died in 1972 in Kansas City, Mo., and

was buried at the Truman Library grounds in Independence.

(A.Sg.)  
BIBLIOGRAPHY. Alfred Steinberg, *The Man from Missouri* (1962), covers Truman's life and activities through his presidency. Other biographies are Jonathan Daniels, *The Man of Independence* (1950), which contains a good account of Truman's early career; and Cabell Phillips, *The Truman Presidency* (1966), a complete study. William Hillman, *Mr. President* (1952), has letters and excerpts from Truman's diaries. Merle Miller, *Plain Speaking* (1974), is a popular work compiled from tapes of interviews conducted with Truman and others during 1961–62. See also Harry S. Truman, *Memoirs*, 2 vol. (1955–56); *Public Papers of the Presidents: Harry S. Truman, 1945–53*, 8 vol. (1961–66), the best collection of source materials; and Margaret Truman, *Harry S. Truman* (1973), a candid, readable account that was written by his daughter. Robert J. Donovan, *Conflict and Crises* (1977), is a detailed examination of Truman's first term in office. Harold Foote Gosnell, *Truman's Crises* (1980), analyzes the subject's entire political career.

**Truman Doctrine**, pronouncement by U.S. Pres. Harry S. Truman on March 12, 1947, declaring immediate economic and military aid to the governments of Greece, threatened by Communist insurrection, and Turkey, under pressure from Soviet expansion in the Mediterranean area. As the United States and the Soviet Union struggled to reach a balance of power during the Cold War that followed World War II, Great Britain announced that it could no longer afford to aid those Mediterranean countries, which the West feared were in danger of falling under Soviet influence. The U.S. Congress responded to a message from Truman by promptly appropriating \$400,000,000 for this purpose.

**Trumbić, Ante** (b. May 27, 1864, Split, Dalmatia, Austria-Hungary—d. Nov. 18, 1938, Zagreb, Yugos.), Croatian nationalist from Dalmatia who played a leading role in the founding of Yugoslavia.

Trumbić entered political life under the Austrian crown, first as a member of the Dalmatian Diet from 1895 and then as representative in the Reichsrat (federal assembly) in Vienna from 1897. In 1905 he was elected mayor of Split. As an advocate of South Slav unity opposed to Habsburg supremacy, Trumbić helped to draft the Rijeka Resolution (1905), by which it was hoped to win the support of anti-Habsburg Hungarians. The scheme failed.

After the beginning of World War I, Trumbić fled, along with other South Slav patriots, to Rome. In 1915 he became president of the Yugoslav Committee, with headquarters in London, which sought the support of the Allies in establishing an independent and united South Slav state. In July 1917 he successfully negotiated with leaders of the Serbian government the Declaration of Corfu, an affirmation of unity that laid the foundation for the future Yugoslav state.

At the conclusion of the war, in December 1918, Trumbić became the first foreign minister of the newly formed Kingdom of Serbs, Croats, and Slovenes and represented his country at the Paris Peace Conference. Formidable difficulties arose over the Italian government's demand for Fiume and extensive territories on the eastern Adriatic coast (promised to it by the British and French in the secret Treaty of London of 1915) as well as with the more independence-minded Croatian nationalists at home. Trumbić's diplomatic skill went far in gaining most of the disputed lands for Yugoslavia and preserving unity at home. He retired from politics in 1929.

**Trumbo, Dalton** (b. Dec. 9, 1905, Montrose, Colo., U.S.—d. Sept. 10, 1976, Los Angeles), screenwriter and novelist who was probably the most talented member of the Hollywood Ten, one of a group who refused to testify before the 1947 U.S. House Committee on



Un-American Activities about alleged communist involvement. He was blacklisted and in 1950 spent 11 months in prison.

Trumbo got his start in movies in 1937; by the 1940s he was one of Hollywood's highest paid writers for work on such films as *Kitty Foyle* (1940), *Thirty Seconds over Tokyo* (1944), and *Our Vines Have Tender Grapes* (1945). After his blacklisting, he wrote 30 scripts under pseudonyms. He won an Oscar for *The Brave One* (1956), written under the name Robert Rich. In 1960 he received full credit for the motion-picture epics *Exodus* and *Spartacus*, and thereafter on all subsequent scripts, and he was reinstated as a member of the Writers Guild of America. Trumbo's vivid antiwar novel, *Johnny Got His Gun*, won an American Booksellers Award for 1939. He filmed the movie of the novel himself in 1971.

**Trumbull, John** (b. April 24, 1750, Westbury, Conn. [U.S.]—d. May 11, 1831, Detroit, Michigan Territory), American poet and jurist, known for his political satire, and a leader of the Hartford Wits (q.v.).

While a student at Yale College (now Yale University), Trumbull wrote two kinds of poetry: "correct" but undistinguished elegies of the Neoclassical school, and brilliant, comic verse that he circulated among friends. His burlesque "Epithalamium" (1769) combined wit and scholarship, and his essays in the style of Joseph Addison were published in *The Boston Chronicle* in 1770. While a tutor at Yale he wrote *The Progress of Dulness* (1772–73), an attack on educational methods.

He passed the bar examinations in 1773 and moved to Boston. His major work was the comic epic *M'Fingal* (1776–82). Despite its pro-Whig bias, its reputation as anti-Tory propaganda has been exaggerated.

His literary importance declined after 1782, as he became increasingly interested in law and politics. He first held office in 1789 as a state's attorney and subsequently as a state legislator and a judge until 1819.

**Trumbull, John** (b. June 6, 1756, Lebanon, Conn. [U.S.]—d. Nov. 10, 1843, New York, N.Y.), American painter, architect, and author, whose paintings of major episodes in the U.S. War of Independence form a unique record of that conflict's events and participants.

Trumbull was the son of the Connecticut governor Jonathan Trumbull (a first cousin to John Trumbull the poet). A boyhood injury to his left eye made him virtually monocular, with the consequence that his small-scale work is finer than his large. He attended Harvard College and then taught school. During the American Revolution he served as an aide to General George Washington, achieving the rank of colonel.

In 1780 he went to London via France, but, as a reprisal for the hanging by the Americans of the British agent Major John André, he was imprisoned there and used the time to study architecture. Released, he returned home but was back in London to study with the painter Benjamin West by 1784.

At the suggestion of West and with the encouragement of Thomas Jefferson, Trumbull in about 1784 began the celebrated series of historical paintings and engravings that he was to work on sporadically for the remainder of his life. From 1789 he was in the United States, but he returned to London in 1794 as secretary to John Jay, remaining for 10 years as a commissioner for the implementation of the Jay Treaty. In 1800 he married an Englishwoman, Sarah Hope Harvey, an amateur painter. He lived in the United States from 1804 to 1808, and in 1808 he attempted portrait painting in London but with little success. From 1815 to 1837 he maintained a rather unsuccessful studio in New York City.

In 1817 Trumbull was commissioned by the U.S. Congress to paint four large pictures

in the rotunda of the Capitol at Washington ("Washington Resigning His Commission," "The Surrender of Cornwallis," "The Surrender of Burgoyne," and, best known of all, "The Declaration of Independence"); series completed in 1824) from the small and far superior originals of these scenes that he had painted in the 1780s and '90s, now in the Yale University Art Gallery. In 1831 Benjamin Silliman, a professor at Yale, established the Trumbull Gallery at Yale, the first art gallery at an educational institution in America. Trumbull gave his best works to this gallery in exchange for an annuity.

**Trumbull, Lyman** (b. Oct. 12, 1813, Colchester, Conn., U.S.—d. June 25, 1896, Chicago, Ill.), U.S. senator from Illinois whose independent views during the Civil War and Reconstruction eras caused him to switch from the Democratic Party to the Republican to the Liberal Republican and back to the Democratic Party in his long political career. Trumbull grew up in Connecticut, and, after studying law and gaining admission to the bar, settled in Illinois. His career in public life began in 1840, when he was elected to the state legislature as a Democrat.

In 1854 Trumbull ran as a Democrat for the U.S. House of Representatives. Although elected, he never served, because in 1855 the state legislature made him a U.S. senator. By 1856 he had become a Republican; his opposition to slavery had made it impossible for him to remain among the Democrats. With the coming of the Civil War, Trumbull staunchly supported President Abraham Lincoln's efforts to suppress rebellion.

Trumbull pressed for making the emancipation of the slaves a Northern war aim, and, as chairman of the Senate Judiciary Committee in 1864, he helped draft the Thirteenth Amendment. He aligned himself with the Radical Republicans in advocating vigorous prosecution of the war and an early end to slavery. Following Lincoln's assassination, he at first supported President Andrew Johnson but then broke with the president over Reconstruction policy. He supported Radical Reconstruction, yet in 1868 he was one of just seven Republican senators voting to acquit Johnson of impeachment charges.

His waning enthusiasm for Radical Reconstruction, his break with the Republican leadership in the trial of Andrew Johnson, and his revulsion at the corruption rampant in the administration of President Ulysses S. Grant led Trumbull to back the Liberal Republican Party in 1872. When party presidential nominee Horace Greeley lost and the party collapsed, Trumbull finished out his third term as senator and then retired to his Chicago law practice. By 1876 Trumbull had returned to the Democratic Party, serving as counsel for Samuel J. Tilden in the disputed presidential election.

**Trump, Donald J(ohn)** (b. 1946, New York, N.Y., U.S.), American real-estate developer who amassed vast hotel, casino, and other real-estate properties in the New York City area.

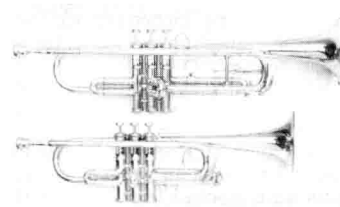
The son of a wealthy apartment-building developer in the Queens borough of New York, Trump graduated from the University of Pennsylvania's Wharton School of Finance in 1968. He went to work in his father's company, the Trump Organization, and worked to expand its holdings of rental housing. In the 1970s he made a series of shrewd property purchases in Manhattan, obtaining generous tax concessions on his land and building purchases from New York's city government, which was eager for new investment at a time when it confronted a severe fiscal crisis. Trump bought and renovated several aging hotel complexes and apartment towers in Manhattan and built new ones there as well. By the 1990s Trump's business empire en-

compassed a number of glamorous high-rises, hotels, and condominiums, including Trump Tower (opened 1983); more than 25,000 rental and co-op apartment units in Queens and Brooklyn; and several hotel-casino complexes in the nearby gambling centre of Atlantic City, N.J. In 1988 Trump bought the Boston-New York-Washington, D.C., shuttle service from failing Eastern Airlines.

**trumpet**, in zoology, any of certain snail species, including members of the conch (q.v.) and triton groups (see triton shell).

**trumpet**, French TROMPETTE, German TROMPETE, in music, brass wind musical instrument sounded by lip vibration against a cup mouthpiece. Ethnologists use the word trumpet for any lip-vibrated instrument, whether of horn, conch, reed, or wood, with a horn or gourd bell, as well as for the modern brass instrument.

The metal trumpet dates from the 2nd millennium BC in Egypt, when it was a small ritual or military instrument sounding only one or



Modern trumpets in (top) Bb and (bottom) D

By courtesy of Boosey & Hawkes Ltd.

two notes. Used in various forms as a military and sometimes civilian signal instrument—as the straight Greek *salpinx*, the similar Roman *tuba*, and the Roman *lituus*, straight with an upturned bell—it came into prominence as a musical instrument in the Middle Ages. Later forms included the natural trumpet of the 16th–18th century and, following the invention of valves (c. 1815), the modern valve trumpet. The valve trumpet, ordinarily built in Bb, maintains the traditional trumpet bore, cylindrical with a terminal bell flare, though usually the bore tapers toward the mouthpiece to provide additional flexibility of tone. The bend near the bell incorporates a tuning slide. The compass ranges from F# below the treble staff to well above the staff, depending on the player's skill. The music is notated a major second higher than the actual sound.

Mouthpieces vary; orchestral players usually prefer a wider and deeper mouthpiece than dance-band and jazz players, who favour a narrower and shallower mouthpiece to produce a sustained forte in the high register. The tone quality may be changed by inserting a mute into the bell: either a conical straight mute of fibre or various aluminum mutes.

Instruments in keys other than Bb are frequently used. The "piccolo" trumpet in D, also known as the Bach trumpet, was invented in about 1890 by the Belgian instrument-maker Victor Mahillon for use in the high trumpet parts of music by J.S. Bach and George Frideric Handel. Other forms include the older Eb trumpet, the trumpet in C, piccolo trumpets in F and high Bb, and the bass trumpet in Bb.

On a natural (valveless) trumpet the possible notes (i.e., the harmonic series) include (c' = middle C):

(c)	g	c'	e'	g'	(bb')
(2)	3	4	5	6	7
c''	d''	e''	(f#')	g''	(a'')
8	9	10	11	12	13
(bb'')	b''	c'''			
14	15	16			



The 2nd harmonic is not producible; the 7th is badly out of tune with the musical scale; the 11th, 13th, and 14th, also out of tune, can with skill be sounded as F or F# and A or G#, respectively. Modern valve trumpets generally use notes 2–12 of this series but pitched an octave lower; depression of the valves lengthens the tubing and allows the production of the intervening notes of the chromatic (12-note) scale.

The most ancient trumpets had straight tubes barely 2 feet (60 centimetres) long, but the medieval *buisine*, a straight instrument retaining the trumpet's traditional association with royalty and pomp, reached a length of about 6 feet (almost 2 metres). Increased length allows a correspondingly greater number of natural harmonics, though the range is also determined by the nature of the player's lips. By c. 1400 the tube had been lengthened to the extent that the trumpet was bent in an S-shape for manageability. By about 1500 it acquired the elongated loop now associated with the instrument. By 1600 court and guild trumpeters, accompanied by kettledrums, were able to play melodies in the higher, or *clarino*, register, where the natural notes form approximately a major scale.

The tonality, or key, of the instrument could be changed by the use of a crook, an extra coil of tubing inserted next to the mouthpiece. The commonest orchestral crook in Bach's era produced the trumpet in D, but toward 1800 trumpets were crooked from F down to low Bb as specified by the composer. Social and musical changes brought a decline in *clarino* playing, and trumpet parts were written mainly in the easier lower registers.

In order to play notes outside the natural series, trumpets with a sliding section of the tube appeared from the Renaissance onward, the most important being the trombone. A German trumpet with a sliding mouthpipe, the *tromba da tirarsi*, was sometimes used in the music of Bach. The English flat trumpet (c. 1695), which had a sliding upper bend near the mouthpiece, reappeared as the slide trumpet found in many 19th-century English orchestras. In Austria and Italy after 1801 there was a vogue for the keyed trumpet, with side holes covered by padded keys.

The valved trumpet appeared in Germany in about 1828, usually pitched in F; its acceptance was delayed in the U.S. and Great Britain because players preferred the cornet in orchestral trumpet parts. In the 20th century, use of the smaller Bb trumpet became almost universal.

**trumpet creeper**, either of two species of ornamental vines of the genus *Campsis* (family



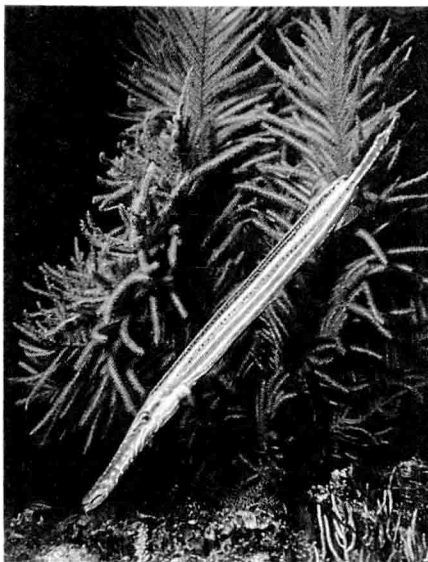
Trumpet vine (*Campsis radicans*)  
John H. Gerard—EB Inc

Bignoniaceae, q.v.). Both are deciduous shrubs that climb by aerial rootlets.

*Campsis radicans*, also called trumpet vine and cow itch, is a hardy climber native in eastern and southern United States; it produces terminal clusters of tubular, trumpet-shaped orange to orange-scarlet flowers. The Chinese trumpet creeper (*C. grandiflora*) of eastern Asia is a poor climber but produces spectacular bunches of brilliant scarlet flowers.

**trumpet fish**, also called FLUTEMOUTH, any of the marine fishes that constitute the family Aulostomidae (order Gasterosteiformes), found along shores in tropical waters. Trumpet fishes have elongated, slender bodies and stiff, tubelike snouts ending in small, weak jaws. The body is covered with small scales, the back bears a row of spines that can be raised in defense, and the chin is provided with a short barbel. West Indies species may attain lengths of up to 180 centimetres (6 feet); northern species, however, are usually less than 30 centimetres (1 foot).

They eat small animals, and they sometimes rest head downward among certain corals (gorgonians), blending with the surroundings. They have also been noted to align themselves along the backs of larger fishes, possibly to obtain protection and transportation from one place to another. Species include *Aulostomus maculatus*, a pale-striped, reddish



Trumpet fish (*Aulostomus maculatus*)  
Douglas Faulkner

or brown Atlantic species, and the painted flutemouth (*A. chinensis*), a variably coloured Pacific form.

Articles are alphabetized word by word,  
not letter by letter

**trumpet marine**, also called TROMBA MARINA, or TRUMSCHEIT (German: "drum log"), stringed musical instrument of medieval and Renaissance Europe, highly popular in the 15th century and surviving into the 18th century. It had a long narrow body and one or two strings, which the player's left thumb touched lightly to produce the notes of the harmonic series, as on a natural trumpet. The strings, originally plucked, were by the 15th century sounded by a bow played between the fingering and the tuning pegs.

The tone of the trumpet marine was brassy and substantial. One foot of the bridge was free and rattled loosely on the belly when the strings vibrated. The stationary bridge foot served as a sound post, extending through the belly to the instrument's back and transmitting the string vibrations to it. In the 17th cen-



Angel playing a trumpet marine (left), detail from "Angel Musicians," panel by Hans Memling; in the Koninklijk Museum voor Schone Kunsten, Antwerp  
By courtesy of the Koninklijk Museum voor Schone Kunsten, Antwerp

tury seven or eight sympathetic strings were set inside the body.

**trumpeter**, also called TRUMPET BIRD, any of three species of long-legged, round-bodied birds comprising the family Psophiidae (order Gruiformes). All are about 50 centimetres (20 inches) long, inhabit northern South America, and are named for their strident calls, uttered as they roam the jungle floor searching for berries and insects. Trumpeters are small-headed and thin-necked, with short, rounded wings, a short bill, and a characteristic hunched posture. Their plumage is dark, with lighter wing patches. Unwary, they are easily killed for their excellent flesh.

The most widespread species is the common, or gray-winged, trumpeter (*Psophia crepitans*). The others are the pale-winged, or white-winged, trumpeter (*P. leucoptera*), and the dark-winged, or green-winged, trumpeter (*P. viridis*), of Brazil.



Gray-winged trumpeter (*Psophia crepitans*)  
Eric Hosking

The name trumpet bird is also applied to certain birds of paradise of the genera *Manucodia* and *Phonygammus* (see bird-of-paradise).

**Trumpler, Robert Julius** (b. Oct. 2, 1886, Zürich—d. Sept. 10, 1956, Berkeley, Calif., U.S.), Swiss-born U.S. astronomer who, in

his extensive studies of galactic star clusters, demonstrated the presence throughout the galactic plane of a tenuous haze of interstellar material that absorbs light generally and decreases the apparent brightness of distant clusters. The presence of this obscuring haze explained why spiral nebulae are observed to be concentrated at the galactic poles.

Trumpler was educated in Switzerland and Germany, went to the United States in 1915, and joined the staff of Lick Observatory, Mount Hamilton, Calif., three years later. In 1922 he went to Wallall, Australia, on a solar-eclipse expedition to test experimentally Einstein's general theory of relativity by observing whether the Sun's gravitational field indeed would bend the light from nearby stars. His observations confirmed Einstein's theory. Trumpler transferred to the astronomical department of the University of California, Berkeley, in 1938 and retired in 1951.

Trumpler's independent observations of galactic star clusters and the differences in them, which indicate their age, helped to provide the foundation of the present theory of stellar evolution. Probably the most successful scheme of classification of galactic clusters by appearance is Trumpler's. He also devised a method of classification in terms of magnitude and spectral type.

His works include "Observations on the Deflection of Light in Passing Through the Sun's Gravitational Field," with the U.S. astronomer William Wallace Campbell (1923); "Spectral Types in Open Clusters" (1925); "Observations of Mars at the Opposition of 1924" (1927); "Preliminary Results on the Distances, Dimensions, and Space Distribution of Open Star Clusters" (1930), all in *Lick Observatory Bulletins*; and "Observational Evidence of a Relativity Red Shift in Class O Stars" (1935), in *Publications of the Astronomical Society of the Pacific*.

**trumscheit** (musical instrument): see trumpet marine.

**trundle bed**, also called TRUCKLE BED, a low bed, so called from the trundles, or casters, attached to the feet so that it could be pushed under the master bed when not in use. It was intended for servants, who used to sleep in their employer's room so as to be near at hand. The framework was usually oak, and suspension was provided by leather or canvas straps looped through holes in the sides.

The first references to the trundle bed occur in the 16th century, and the bed remained in use until the late 18th century. The phrase is still used in some rural areas to describe a small bed of any kind, and the concept survives in the metaphor "to truckle under," or to be subservient.

**Trung Sisters**, byname of TRUNG TRAC and TRUNG NHI (fl. AD 39–43), heroines of the first Vietnamese independence movement, heading a rebellion against the Chinese Han-dynasty overlords and briefly establishing an autonomous state. Their determination and apparently strong leadership qualities are cited by scholars of Southeast Asian culture as testimony to the respected position and freedom of women in Vietnamese society, as compared with the male-dominated societies of China and India.

Trung Trac, the elder sister, was the widow of Thi Sach, lord of Chau Dien, in northern Vietnam, who had been assassinated by a Chinese general for plotting with other lords to overthrow the Chinese. Trung Trac thereupon assumed leadership of the movement. In AD 39 she, with her sister Trung Nhi and other members of the aristocracy, marched on Lien Lau, forcing the Chinese commander to flee. Within a year the sisters and their allies held 65 northern citadels. At Me Linh, in the lower Red River delta, the Trung Sisters jointly proclaimed themselves queens of an indepen-

dent state (of unknown name) extending from southern China to the present site of Hue.

The Trung Sisters' revolutionaries—without peasant support, without supplies, and with untrained forces—were no match, however, for the seasoned Chinese troops of General Ma Yuan (Ma Vien). He defeated them first at Lang Bac, near the present site of Hanoi. The Trung Sisters then retreated to Hat Mon, now Son Tay, where they were decisively beaten. Unable to face defeat, they committed suicide, drowning themselves at the juncture of the Day and Red rivers in AD 43. The Hai Ba ("Two Sisters") pagoda at Hanoi and the pagoda of Hat Mon, in the province of Son Tay, are dedicated to the Trung Sisters, and an avenue in downtown Ho Chi Minh City is named for them.

**trunkfish**: see boxfish.

**Truong Chinh**, original name DANG XUAN KHU (b. Feb. 9, 1907, Ha Nam Ninh province, Vietnam—d. Sept. 30, 1988, Hanoi), Vietnamese scholar and statesman, a leading North Vietnamese communist intellectual.

While a high school student at Nam Dinh, Truong Chinh became an activist in the anticolonialist movement; he joined Ho Chi Minh's organization, the Vietnamese Revolutionary Youth Association, in 1928, taking part in student demonstrations against the French. Arrested and expelled from the local high school, he continued his education in Hanoi, where he received his degree and supported himself as a teacher while pursuing a political career within the recently formed Indochinese Communist Party (PCI). While editing a Communist Party newspaper in Hanoi, he was arrested by the French in 1932 and spent the next four years in prison. Paroled in 1936, he was a well-qualified candidate for command in the PCI, most of whose earlier leaders had been executed or exiled. About this time he adopted the name Truong Chinh ("Long March"), after Mao Zedong's famous march.

The Communist Party was banned in Indochina during World War II, and Truong Chinh and his associates continued their work underground. In 1941 Truong Chinh became secretary-general of the PCI, in charge of the dissemination of communist doctrine in Vietnam. With General Vo Nguyen Giap, Truong Chinh planned the tactical strategy that led to victory by the Vietnamese over Japanese occupation forces in August 1945 and to the establishment of the Democratic Republic of Vietnam, headed by Ho Chi Minh. Truong Chinh described these events in his book *The August Revolution*. The PCI was disbanded but reemerged as the Alliance for the Dissemination of Marxism, with Truong Chinh as its chairman and leading theoretician. In 1951 the Vietnam Workers' Party (Dang Lao-Dong Viet-Nam) was born, with Truong Chinh as secretary-general.

Truong Chinh's power was eclipsed briefly in 1956, when he was held responsible for failures of the Central Reform Committee. He lost his post as secretary-general of the party, but by April 1958 he had again become a public figure and was appointed vice premier of North Vietnam and president of the Scientific Research Council. Following the death of Ho Chi Minh in 1969, Truong Chinh, Le Duan, and Pham Van Dong formed the controlling triumvirate of North Vietnamese politics. He was chairman of the Standing Committee of the National Assembly from 1960 to 1981 and was president of the State Council from 1981 to 1987.

Truong Chinh sought to organize North Vietnam along lines similar to those of the People's Republic of China. He won recognition as a writer and poet and as a leading dialectician; he wrote *The Resistance Will Win* (1947), an explicit set of directives for guerrilla warfare. A biographical account of Truong

Chinh is given in the preface to *Primer for Revolt* (1963), a collection of his writings by Bernard B. Fall.

**Truong-son** (Southeast Asia): see Annamitique, Chaîne.

**Truong Vinh Ky**: see Petrus Ky.

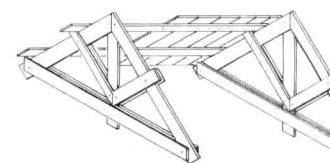
**Truro**, town, seat of Colchester county, central Nova Scotia, Can., on the Salmon River, near the head of Cobequid Bay, an eastern arm of the Minas Basin, 61 miles (98 km) north-northeast of Halifax. The site was originally settled in the 1670s by Acadians, who were expelled in 1755. They were followed in 1761 by New Englanders and Scots-Irish from Ulster, and the original name, Cobequid (Micmac Indian: "end of flowing water"), was changed to Truro, for the town in Cornwall. The township of Truro was created in 1765, and the town was incorporated in 1875. Now a commercial centre in a farming and lumbering area, it also is an industrial town with dairy processing, printing, and the manufacture of building materials, textiles, and clothing. It is the site of provincial agricultural, business, and teachers' colleges. A provincial exposition is held annually. Victoria Park (1,000 acres [405 hectares]), noted for its scenery, has two picturesque waterfalls in a deep gorge. Pop. (1981) 12,552.

**Truro**, city, Carrick district, county of Cornwall, England. It is centrally situated in the county on the River Truro at the head of the tidal estuary of the River Fal. Truro's first charter dates from 1130 to 1140, but the borough was not created a city until 1877. Truro shares some administrative functions with neighbouring Bodmin, the county town (seat) of Cornwall. The Anglican diocese of Truro, centred on the Cathedral of St. Mary (1880–1910), covers Cornwall and part of the county of Devon. Industries in the city include timber, food processing, and light engineering. Dredging enables small vessels to reach the quays, but the harbour is dry at low tide. China clay is the chief export. Pop. (1981) 16,348.

**Truro**, town (township), Barnstable county, southeastern Massachusetts, U.S., near the northern tip of Cape Cod. Settled in 1700, it was incorporated in 1709 and named for Truro, in Cornwall; it soon became a bustling fishing centre. Futile attempts at farming and failure to continue successful fisheries (owing to the silting of harbours and marine disasters offshore) led to the town's decline, but an artists' and writers' colony developed there in the early 20th century and has survived. The Highland (Cape Cod) Light (5 miles [8 km] north) was originally established in 1797. The Pilgrims spent their second night in the New World (1620) at Pilgrim Spring (7 miles [11 km] northeast), where they found fresh water. Summer tourism is the economic mainstay. Pop. (1990) 1,573.

**truss**, in engineering, a structural member usually fabricated from straight pieces of metal or timber to form a series of triangles lying in a single plane. (A triangle cannot be distorted by stress.)

A truss gives a stable form capable of supporting considerable external load over a large span with the component parts stressed pri-



Triangular wooden truss



marily in axial tension or compression. The individual pieces intersect at truss joints, or panel points. The connected pieces forming the top and bottom of the truss are referred to respectively as the top and bottom chords. The sloping and vertical pieces connecting the chords are collectively referred to as the web of the truss.

Trusses were probably first used in primitive lake dwellings during the early Bronze Age, about 2500 BC. The first trusses were built of timber. The Greeks used trusses extensively in roofing, and trusses were used for various construction purposes in the European Middle Ages. Andrea Palladio's *I quattro libri dell'architettura* (1570; *Four Books on Architecture*) contained plans for timber trusses. A major impetus to truss design came in the development of covered bridges in the United States in the early 19th century. Cast iron and wrought iron were succeeded by steel for railroad truss bridges. The two systems most commonly used are the Pratt and the Warren; in the former, the sloping web members are parallel to each other, while, in the latter, they alternate in direction of slope. Trusses are also used in many kinds of machinery, such as cranes and lifts, and in aircraft wings and fuselages.

**truss**, in medicine, device for holding a reduced hernia in place. In treating infants, an interlacing of yarn forms a supportive pad that is placed over the herniated area. In adult treatment, a pad of heavier material is placed over the hernia to prevent protrusion. A truss is usually a temporary expedient and seldom used as a substitute for surgical repair. A nasal truss is a trusslike device used to hold bones of the nose in place after a fracture.

**trust**, in Anglo-American law, a relationship between persons in which one has the power to manage property and the other has the privilege of receiving the benefits from that property. There is no precise equivalent to the trust in civil-law systems.

A brief treatment of trusts follows. For full treatment, see *MACROPAEDIA: Property Law*.

The trust is of great practical importance in Anglo-American legal systems. Consciously created trusts, usually called "express trusts," are used in a wide variety of contexts, most notably in family settlements and in charitable gifts. Courts may also impose trusts on people who have not consciously created them in order to remedy a legal wrong ("constructive trusts").

Fundamental to the notion of the trust is the division of ownership between "legal" and "equitable." This division had its origins in separate English courts in the late medieval period. The courts of common law recognized and enforced the legal ownership, while the courts of equity (e.g., Chancery) recognized and enforced the equitable ownership. The conceptual division of the two types of ownership, however, survived the merger of the law and equity courts that occurred in the 19th and 20th centuries. Thus, today, legal and equitable interests are usually enforced by the same courts, but they remain conceptually distinct.

The basic distinction between legal and equitable ownership is quite simple. The legal owner of the property (the "trustee") has the right to possession, the privilege of use, and the power to convey those rights and privileges. The trustee thus looks like the owner of the property to all the world except one person, the beneficial owner ("beneficiary"). As between the trustee and the beneficiary, the beneficiary receives all the benefits of the property. The trustee has the fiduciary duty to the beneficial owner to exercise his legal rights, privileges, and powers in such a way

as to benefit not himself but the beneficiary. If the trustee fails to do this, the courts will require him to account to the beneficiary and may, in extreme cases, remove him as legal owner and substitute another in his stead.

The divisions between legal and beneficial ownership are normally created by an express instrument of trust (usually a deed of trust or a will). The maker ("settlor") of the trust will convey property to the trustee (who may be an individual or a corporation, such as a bank or trust company) and instruct the trustee to hold and manage the property for the benefit of one or more beneficiaries of the trust.

While trusts are normally created by an express instrument of trust, courts will sometimes imply a trust between people who have not gone through the formal steps. A simple example would be the situation in which one member of a family advances money to another and asks the second member to hold the money or to invest it for him. A more complicated example of an implied trust would be the situation in which one party provides money to another for the purchase of property. Unless such provision was explicitly made as a gift or as the natural expression of a close relationship (e.g., parent-child), the acquired property is held in trust for the person who provided the money even though the second party holds the legal title. (This type of trust is frequently called a "resulting trust.") Finally, courts will sometimes impose a trust relationship upon parties where there is no evidence that such a relationship was intended. For example, where one party obtains property from another by making fraudulent representations, the defrauding party is frequently required to hold the property in trust for the defrauded party. (This type of trust is a constructive trust.)

Private express trusts are probably the most common form of trust. They are a traditional means of providing financial security for families. By will or by deed of trust, a testator or settlor places property in trust to provide for his family after he is deceased. The trustee may be a professional or may be a member of the family with experience in managing money, or a group of trustees may be chosen. The trustees will invest the property in a way that allows them to make regular payments to the deceased's survivors. In some situations, such as where the deceased left minor or incompetent survivors, a court may create a trust for such persons' benefit, even if the deceased did not do so. Hence, statutory guardianships for minors and incompetents are sometimes called "statutory trusts."

Public express trusts are created to benefit larger numbers of people, or, at least, are created with wider benefits in mind. The most common public trusts are charitable trusts, whose holdings are intended to support religious organizations, to enhance education, or to relieve the effects of poverty and other misfortunes. Such trusts are recognized for their beneficial social impact and are given certain privileges, such as tax exemption. Other public trusts are not considered charitable and are not so privileged. These include holdings for public groups with a common interest, such as a political party, a professional association, or a social or recreational organization.

In the commercial sector, trusts have come to play important roles. Trusts may be established to manage various funds designated for special purposes by businesses and corporations. Such designations might include funds deposited against bonds issued by the company or liens on property that are being used as collateral against bonds. Money for employee-pension funds or profit-sharing programs is often managed through trust arrangements. Such commercial trusts are almost always managed by corporate trustees.

Some modern civil-law systems, such as that of Mexico, have created an institution like

a trust, but this has normally been done by adapting trust ideas from the Anglo-American system rather than by developing native ideas. In civil-law jurisdictions, many of the purposes to which the Anglo-American trust is put can be achieved in other ways. For example, the charitable trust of Anglo-American law has a close analogy in the civil-law "foundation" (French *fondation*, German *Stiftung*). Regarding the purposes for private express trusts mentioned above, lawyers in European countries get professional management for assets by turning them over to managers who are paid a fee for their services. There is, however, a greater preference in civil-law countries than there is in Anglo-American ones for the administration of property by the person who owns and benefits from it.

**trust company**, corporation legally authorized to serve as executor or administrator of decedents' estates, as guardian of the property of incompetents, and as trustee under deeds of trust, trust agreements, and wills, as well as to act in many circumstances as an agent. Trust companies may have commercial banking departments, and commercial banks may have trust departments. In some countries, trust companies and commercial banks, though separate institutions, are often affiliated. Because the United States pioneered in the development of incorporated trust institutions, legislation and practices of other countries often have been modeled upon American patterns. State laws in the United States generally prescribe minimum capital and surplus requirements for trust operations and require the segregation of trust assets from banking-department assets, the segregation of and separate accounting for the assets of each trust estate, and the specific allocation of managerial responsibility for trust operations.

Trust companies serve as trustees for individuals, business corporations, nonprofit institutions, and governmental bodies. They distinguish between personal trusts and corporate trusts, often having separate departments for the two classes. In serving as trustee, the company usually takes legal title to property conveyed to it and manages it according to the instructions of the creator of the trust, the prescriptions of state law, or the directions of a court having jurisdiction, depending upon the circumstances by which the trust originates. When trust companies accept various managerial duties on an agency basis, they do not take title to property.

Trust services for individuals tend to centre on the administration of estates. Other personal trust work of trust companies is concerned chiefly with living trusts and testamentary trusts. Any person during his lifetime may convey property in trust to a trust company with instructions as to the disposal of the income from the property and eventually of the property itself. Such living trusts are used especially by the wealthy who seek to reduce the burden of estate taxes. Testamentary trusts, which originate in wills, arise when a person stipulates that his estate is not to be distributed but is to be held in trust for a certain period of time.

Their principal service to business corporations is to serve as trustees under corporate bond indentures. In this capacity, a trust company takes title to or a lien upon any property put up as security and verifies the performance of requirements imposed by the loan contract. This function is a matter of rather rigid verification and involves little discretionary action. A service involving more discretion on the part of the trust company is the management of corporate pension funds. Companies seeking higher returns on such funds than can be offered by group insurance plans may transfer these funds to a trust company for management. Trust companies may also serve as transfer agents (keeping records of

a corporation's stockholders or bond owners), as corporate stock registrars (responsible for the proper issuance of new stock certificates when additional stock is sold or outstanding stock is transferred), and as paying agents for the distribution of dividends.

**Trusteeship Council**, one of the principal organs of the United Nations (UN), responsible for supervising the government of trust territories and for leading them to self-government or independence. The council consists of member states administering trust territories, permanent members of the Security Council that do not administer trust territories, and other members elected by the General Assembly for three-year terms. The council meets once a year; each member has one vote, and decisions are made by a simple majority of those present.

The concept of international supervision of colonial territories was introduced by U.S. President Woodrow Wilson at the Paris Peace Conference in 1919; his assertion that there should be "no annexations" resulting from the victory over Germany and Turkey eventually produced the mandate system of the League of Nations.

The trusteeship system of the UN, like the mandate system of the League of Nations, was established on the principle that colonial territories taken from defeated enemies should not be annexed by any victorious nation but should be administered by a mandatory, or trust, power under international supervision until they were able to determine their own future status. The trusteeship system differed from the mandate system in its provision for the submission of petitions and for periodic visits to the trust territories by UN missions.

In 1945 only 12 League of Nations mandates remained: Nauru, New Guinea, Ruanda-Urundi, Togoland and Cameroon (French administered), Togoland and Cameroon (British administered), Pacific Islands (Carolines, Marshalls, and Marianas), Western Samoa, South West Africa, Tanganyika, and Palestine. All of these became UN trust territories except South West Africa (now Namibia), which South Africa refused to enter into the trusteeship system, despite vigorous international criticism over the years. By 1991 some form of self-government had been achieved by all trust territories except the Republic of Palau (Belau) in the Trust Territory of the Pacific Islands, which was administered by the United States. *See also* mandate.

**Truth, Sojourner**, legal name ISABELLA VAN WAGENER (b. c. 1797, Ulster county, N.Y., U.S.—d. Nov. 26, 1883, Battle Creek, Mich.), American black evangelist and reformer who applied her religious fervor to the abolitionist and women's-rights movements.



Sojourner Truth

By courtesy of the Burton Historical Collection, Detroit Public Library

Isabella was born into slavery and spent her childhood as an abused chattel of several masters. Her first language was Dutch. Between 1810 and 1827 she bore at least five children to a fellow slave named Thomas. Just before New York state abolished slavery in 1827, she was sold to Isaac Van Wagener, who set her free. With the help of Quaker friends, she waged a court battle in which she recovered her small son, who had been sold illegally into slavery in the South. About 1829 she went to New York City with her two youngest children, supporting herself through domestic employment.

Since childhood Isabella had had visions and heard voices, which she attributed to God. In New York City she became associated with Elijah Pierson, a zealous religious missionary. Working and preaching in the streets, she joined his Retrenchment Society and eventually his household.

In 1843 she left New York City and took the name Sojourner Truth, which she used from then on. Obeying a supernatural call to "travel up and down the land," she sang, preached, and debated at camp meetings, in churches, and on village streets, exhorting her listeners to accept the biblical message of God's goodness and the brotherhood of man. In the same year she was introduced to abolitionism at a utopian community in Northampton, Mass., and thereafter spoke in behalf of the movement throughout the state. In 1850 she traveled throughout the Midwest, where her reputation for personal magnetism preceded her and drew heavy crowds. She supported herself by selling copies of her book, *The Narrative of Sojourner Truth*, which she had dictated to Olive Gilbert.

Encountering the women's-rights movement in the early 1850s, and encouraged by other women leaders, notably Lucretia Mott, she continued to appear before suffrage gatherings for the rest of her life.

In the 1850s Sojourner Truth settled in Battle Creek, Mich. At the beginning of the American Civil War, she gathered supplies for Negro volunteer regiments and in 1864 went to Washington, D.C., where she helped integrate streetcars and was received at the White House by President Abraham Lincoln. The same year she accepted an appointment with the National Freedmen's Relief Association counseling ex-slaves, particularly in matters of resettlement. As late as the 1870s she encouraged the migration of freedmen to Kansas and Missouri. In 1875 she returned to the city of Battle Creek, where she remained until her death.

**BIBLIOGRAPHY.** Two reliable biographies are Arthur H. Fauset, *Sojourner Truth* (1938, reprinted 1971); and Hertha E. Pauli, *Her Name Was Sojourner Truth* (1962, reissued 1976).

**Truth or Consequences**, formerly (until 1950) HOT SPRINGS, city, seat (1937) of Sierra county, southwestern New Mexico, U.S. It lies along the Rio Grande, east of the Black Range in Gila National Forest, 60 miles (97 km) north-northwest of Las Cruces. The locality by the Springs of Palomas (now called Hot Springs) was first settled in the mid-19th century.

The community was named Hot Springs and attained a reputation as a mineral spa. It also became a service point for the surrounding stock-raising, mining, and farming areas. Its present controversial place-name was adopted in 1950 when the city council cooperated with radio (later television) personality Ralph Edwards, master of ceremonies of the quiz show called "Truth or Consequences," in a promotion effort to hold a yearly program and fiesta there. The city lies between two state parks—Elephant Butte Lake (northeast) and Caballo Lake (south)—and tourism, aided by the medicinal springs, is important. Pop. (1990) 6,221.

**truth-value**, in logic, truth ( $T$  or  $+$ ) or falsity ( $F$  or  $0$ ) of a given proposition or statement. Logical connectives, such as disjunction (symbolized  $\vee$ , for "or") and negation (symbolized  $\sim$ ), can be thought of as truth-functions, because the truth-value of a compound proposition is a function of, or a quantity dependent upon, the truth-values of its component parts.

The truth-value of a compound statement can readily be tested by means of a chart known as a truth table. Each row of the table represents a possible combination of truth-values for the component propositions of the compound, and the number of rows is determined by the number of possible combinations. For example, if the compound contains just two component propositions, there will be four possibilities and thus four rows to the table. The logical properties of the common connectives may be displayed by truth tables as follows:

And			Or		
$p$	$q$	$p \cdot q$	$p$	$q$	$p \vee q$
$T$	$T$	$T$	$T$	$T$	$T$
$T$	$F$	$F$	$T$	$F$	$T$
$F$	$T$	$F$	$F$	$T$	$T$
$F$	$F$	$F$	$F$	$F$	$F$

If... then			Not	
$p$	$q$	$p \supset q$	$p$	$\sim p$
$T$	$T$	$T$	$T$	$F$
$T$	$F$	$F$	$F$	$T$
$F$	$T$	$T$		
$F$	$F$	$T$		

in which  $\cdot$  signifies "and" and  $\supset$  signifies "if... then." (In the "or" table, for example, the second line reads "If  $p$  is true and  $q$  is false, then  $p \vee q$  is true.") Truth tables of much greater complexity, those with a number of truth-functions, can be constructed by means of a computer. Abstract systems of logic have been constructed that employ three truth-values (e.g., true, false, and indeterminate), or even many, as in the logic of electronic switching circuits.

**TRW Inc.**, formerly (1958–65) THOMPSON RAMO WOOLDRIDGE INC., major American manufacturer of advanced equipment and systems for industry and government. Headquarters are in Cleveland, Ohio.

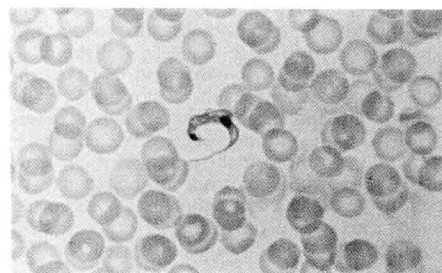
The company began as the Cleveland Cap Screw Company, with 29 employees, in 1901. It later changed its name to the Electric Welding Products Company and in 1916 incorporated as the Steel Products Company, acquiring the Michigan Electric Welding Company and the Metals Welding Company. The name was changed to Thompson Products, Inc., in 1926. In 1958 it merged with Ramo-Wooldridge Corporation, of which it owned the majority of stock, becoming Thompson Ramo Wooldridge Inc. The name was changed to TRW Inc. in 1965.

Throughout its history the company has expanded and diversified through the acquisition of other technical companies. Through its various divisions and subsidiaries, TRW designs and manufactures a wide range of parts for cars, trucks, and other vehicles and offers advanced engineering and research services. Its largest segment is the manufacture of automotive components. The electronic and space-systems segment manufactures electronic components and communications systems for defense, space, commercial, and retail applications; provides computer software and analytic services; and designs and builds spacecraft and spacecraft subsystems. Its industrial and energy segment makes tools and machine parts; manufactures components for commercial and military aircraft; and devel-



ops, builds, and manages energy services. The company has manufacturing facilities both in the United States and abroad.

**trypanosome**, any member of a genus (*Trypanosoma*) of parasitic zooflagellate protozoans belonging to the order Kinetoplastida. Adult trypanosomes are mainly blood par-



Trypanosome with human red blood cells (highly magnified)

John J. Lee

asites of vertebrates, especially fishes, birds, and mammals. Most species require an intermediate host (often an insect or a leech) to complete their life cycle. Sleeping sickness (*q.v.*; also called African trypanosomiasis), for example, caused by *T. gambiense* or *T. rhodesiense*, is transmitted by tsetse flies. In South and Central America, *T. cruzi*, the agent of Chagas' disease (*q.v.*), and the harmless *T. rangeli* are transmitted by bloodsucking insects. Other species of trypanosomes induce economically important diseases of livestock: nagana, surra, mal de caderas, and dourine.

**trypanosomiasis**, either of two parasitic diseases caused by flagellate protozoa of the genus *Trypanosoma*, specifically (1) American trypanosomiasis, or Chagas' disease (*q.v.*), which occurs in the Central and South American tropics, and (2) African trypanosomiasis, or sleeping sickness (*q.v.*), which occurs in equatorial Africa and is transmitted by tsetse flies.

**tryparsamide**, synthetic drug that is used in the treatment of African sleeping sickness (African trypanosomiasis), which is an infestation by the protozoan *Trypanosoma*. Tryparsamide is an organic arsenical—*i.e.*, a compound made by incorporating arsenic into an organic molecule. Administered by intravenous injection in the form of an aqueous or saline solution, it attacks the protozoan during the stage in which it circulates in the bloodstream and concentrates in the lymph nodes. Tryparsamide also is effective in the treatment of syphilis of the central nervous system.

**tryptophan**, an amino acid obtainable in small quantities (often less than two percent) by hydrolysis of most proteins. First isolated from casein (1902), it is important in the biosynthesis of the vitamin niacin (nicotinic acid), the lack of which causes pellagra (*q.v.*) in humans. Tryptophan is one of several so-called essential amino acids; *i.e.*, animals cannot synthesize it and require dietary sources. (It is produced from carbohydrates in microorganisms.) Diets poor in tryptophan and niacin thus lead to pellagra.

**tsaddik** (Judaism): *see* tzaddiq.

**Tsai-ch'un** (Chinese emperor): *see* T'ung-chih.

**Ts'ai Lun**, Pinyin CAI LUN, courtesy name (*izu*) CHING-CHUNG (b. c. AD 50, Ch'en-chou [in modern Hunan province], China—d. 121, China), Chinese court official who is traditionally credited with the invention of paper.

Ts'ai Lun was a eunuch who entered the service of the imperial palace in 75 and was

made chief eunuch under the emperor Ho-ti (reigned 88–105/106) of the Eastern Han dynasty in the year 89. In about the year 105 Ts'ai conceived the idea of forming sheets of paper from the macerated bark of trees, hemp waste, old rags, and fishnets. The paper thus obtained was found to be superior in writing quality to cloth made of pure silk (the principal writing surface of the time), as well as being much cheaper and having more abundant sources.

Ts'ai reported his discovery to the emperor, who commended him for it. Important improvements were subsequently made to Ts'ai's papermaking process by his apprentice, Tso Po, and the process was rapidly adopted throughout China, from which it eventually spread to the rest of the world. Ts'ai himself was named a marquess in 114.

**Ts'ai Shen**, Pinyin CAI SHEN, also called (Wade-Giles romanization) TS'AI PO HSING CH'UN, the popular Chinese god (or gods) of wealth, widely believed to bestow on his devotees the riches carried about by his attendants. During the two-week New Year celebration, incense is burned in Ts'ai Shen's temple (especially on the fifth day of the first lunar month), and friends joyously exchange the traditional New Year greeting "May you become rich" (*Kung hsi fa ts'ai*).



Ts'ai Shen, wood figurine; in the Musée Guimet, Paris

By courtesy of the Musée Guimet, Paris

A Ming-dynasty novel (*Feng Shen Yen I*) relates that when a hermit, Chao Kung-ming, employed magic to support the collapsing Shang dynasty (12th century BC), Chiang Tzu-ya (supporter of the subsequent Chou-dynasty clan) made a straw effigy of Chao and, after 20 days of incantations, shot an arrow made of peach-tree wood through the heart of the image. At that moment Chao became ill and died. Later, during a visit to the temple of Yüan Shih, Chiang was rebuked for causing the death of a virtuous man. He carried the corpse, as ordered, into the temple, apologized for his misdeed, extolled Chao's virtues, and in the name of that Taoist god canonized Chao as Ts'ai Shen, god of wealth, and proclaimed him president of the Ministry of Wealth. (Some accounts reverse the dynastic loyalties of Chao and Chiang.)

Another account identifies Ts'ai Shen as Pi Kan, put to death by order of Chou Hsin, last Shang emperor, who was enraged that a relative should criticize his dissolute life. Chou Hsin is said to have exclaimed that he now

had a chance to verify the rumour that every sage has seven openings in his heart.

**Tsai-t'ien** (Chinese emperor): *see* Kuang-hsü.

**Ts'ai-tien** (China): *see* Han-yang.

**Ts'ai Yüan-p'ei**, Pinyin CAI YUANPEI (b. January 1863, Shanyin, Chekiang province, China—d. March 5, 1940, Hong Kong), educator and revolutionary who served as head of Peking University from 1916 to 1926 during the critical period when that institution played a major role in the development of a new spirit of nationalism and social reform in China.

Ts'ai passed the highest level of his civil-service examination in 1890, becoming one of the youngest successful candidates in the history of the imperial examination system. In 1904 he helped organize and became the first president of the Restoration Society (Kuang-fu hui), a revolutionary group dedicated to the overthrow of the Manchu dynasty. Most of this group later became affiliated with the United League (T'ung-meng hui), formed in 1905 by the revolutionary leader Sun Yat-sen, and Ts'ai became head of the party's Shanghai branch. As provisional president of the Chinese republic, Sun Yat-sen appointed Ts'ai minister of education in January 1912, following the overthrow of the 2,000-year-old Chinese imperial system. Six months later, shortly after the presidency passed to the military dictator Yüan Shih-k'ai, Ts'ai resigned his post and went to Europe, where he remained, except for a brief interval in 1913, until late in 1916. During this period, Ts'ai organized a work-study program in which more than 2,000 Chinese students and labourers traveled to France to study in the schools and work in the factories. Many future Chinese leaders were trained in this program, including Zhou Enlai, who helped organize one of the first Chinese Communist cells while in Paris.

In 1916, after first declining a post as governor of the central Chinese province of Chekiang, Ts'ai was made chancellor of China's most prestigious school, Peking University. The university served as a centre of the May Fourth Movement, which began in 1919 as a student demonstration against imperialist exploitation of China and ended as a nationwide movement. Most of the future leaders of China—including the young Mao Zedong, who worked as a clerk in the library—were associated with the university at this time.

In 1926 Ts'ai left Peking to participate in revolutionary activities against Chiang Kai-shek's Northern Expedition to unify China. After the failure of these efforts, Ts'ai continued to work for the cause of higher education, accepting positions in Chiang Kai-shek's government. In 1928 he helped found and served as the first president of the Academia Sinica, China's highest institution of academic study and research. In 1935 Ts'ai resigned all official posts and retired to Shanghai.

**Tsaidam Basin**, Wade-Giles romanization CH'AI-TA-MU P'EN-TI, Pinyin QAI DAI DAM PENDI, northeastern section of the Plateau of Tibet, occupying the northern and western parts of Tsinghai province, China. The basin is bounded on the south by the towering Kunlun Mountains, with many peaks in the western part more than 20,000 feet (6,000 m) above sea level, and in the north by the A-erh-chin and Nan mountain systems, across which there is only one practicable pass into the western extremity of Kansu province, the Tang-chin Pass. The main access to the basin is through the area around Koko Nor (Blue Lake). The basin is considerably lower than other sections of the Plateau of Tibet, being at an average height of between 8,000 and 10,000 feet (2,400 and 3,000 m) above sea level.

The Tsaidam Basin is almost entirely an area of interior drainage, with rivers discharging either into Koko Nor or into one of the nu-



merous salt lakes and saline swamps in the basin's central area. In the northwest of the basin is an area of true desert. Another area of true desert occurs in the subsidiary basin in the north, around the Su-kan Lake (a salt lake). The Charhan Salt Marsh in the centre of the basin is China's largest surface rock-salt bed, with an area of 618 square miles (1,600 square km) and solid salt deposits up to 50 feet (15 m) thick. The area has a climate marked by long and extremely cold winters, great temperature variations, and minimal rainfall—the total precipitation of the area is less than 4 inches (100 mm) a year. Outside the desert and salt-marsh areas in the centre of the basin, the land is rolling plain covered with poor grass, but the slopes of the surrounding mountains have areas of good grassland, particularly in the north, where the A-erh-chin and Nan mountains have some forested areas, especially near Koko Nor.

Until recent times the Tsaidam area was sparsely peopled, and the population was for the most part composed of pastoralists noted for their horse breeding; the region is also renowned for its sheep. Since World War II, however, the mineral riches of the area have attracted attention. These include vast deposits of salt, potash, various borate minerals, and boron. In the 1950s extensive geologic surveys of the area revealed rich reserves of coal, oil, and asbestos. Oil fields are in operation, including several around Mang-ya. A large oil refinery has been constructed at Leng-hu, southeast of the Tang-chin Pass, and another has been built at Mang-ya. Very large iron deposits have also been found at Golmud, which has developed a chemical industry using local materials and which produces fertilizer on a considerable scale. In the late 1970s the railway from Lan-chou in Kansu to Hsi-ning in Tsinghai was extended to Golmud, and a network of highways had been constructed. The area has also been the scene of experiments in agriculture. With intensive irrigation, some of the marginal areas in the north and east are used to grow wheat.

**Tsamkong** (China): see Chan-chiang.

**Tsan-Usdi** (Cherokee Indian chief): see Ross, John.

**Ts'ang-chou**, Pinyin CANGZHOU, city in Hopeh sheng (province), China. Ts'ang-chou is situated on the low-lying coastal plain about 60 miles (100 km) south of Tientsin on the Grand Canal and on the Tientsin-P'u-k'ou railway. The coastal plain there is very low, and in historical times the coastline was much farther inland than at present.

The Han dynasty (206 BC–AD 220) first established a county there, Fou-hai, some 25 miles (40 km) northeast of the present city. The first town of Ts'ang-chou was established in the 5th century, some 15 miles (24 km) southeast of the present city. The area became important in the late part of the Sui dynasty (581–618) and in the early part of the T'ang dynasty (618–907), after the completion of the Yung-chi canal linking the area of Tientsin with the Huang Ho (river) and Lo-yang in Honan province. Because the city was in an area of poor natural drainage traversed by several large rivers, the T'ang dynasty, in the late 7th century, constructed a canal to give the city better drainage and direct access to the sea. After the 8th century the Yung-chi canal was abandoned, and Ts'ang-chou's role as a transport centre declined. Under the Yüan (1206–1368) and Ming (1368–1644) dynasties, however, the new Grand Canal linking the Peking area to Yang-chou passed through this area, and Ts'ang-chou became an important port for merchant shipping on the canal.

Ts'ang-chou is a collecting centre for the agricultural produce of the surrounding area, particularly for the land west of the Grand Canal. The eastern area has suffered from repeated

inundations and from the consequent salinity of the soil and is sparsely peopled in comparison with most of the North China Plain. The coastal area produces a good deal of salt. Since 1963, however, the area has been subjected to intensive flood-control measures, drainage, and irrigation works as part of the Hai River project. Although Ts'ang-chou's population has grown considerably since 1949, it remains a transportation and commercial centre, with negligible industrial development. Pop. (1985 est.) 190,800.

**Tsang-po** (Asia): see Brahmaputra River.

**Ts'ang-wu** (China): see Wu-chou.

**Tsankov, Aleksandŭr** (b. 1879, Oriakhova, Bulg.—d. July 17, 1959, Belgrano, Arg.), politician, prime minister of Bulgaria (1923–26) during years of great domestic unrest and violence.

Tsankov studied law at Sofia University, where in 1910 he became professor of economics. Originally a social democrat, he had by 1922 moved considerably to the right politically, becoming in that year leader of the conservative group National Concord (Naroden Zgovor), which conspired to overthrow the radical peasant dictatorship of Aleksandŭr Stamboliyski.

After the military coup of June 9, 1923, Tsankov replaced Stamboliyski as premier; but resistance to his regime claimed thousands of lives during the following months. His new political coalition, the "Democratic Entente," secured a large majority in the November 1923 elections, but civil disturbances nonetheless continued practically unchecked through the end of his ministry (January 1926). During the 1930s Tsankov headed the Bulgarian fascist movement, and in September 1944, after the Soviet occupation of his country, he formed a short-lived Bulgarian government-in-exile in Austria under German auspices. For several months following World War II, he was interned in Austria by U.S. forces. On his release he emigrated to South America.

**Ts'ao Chan**, Pinyin CAO ZHAN, also called (Wade-Giles romanization) TS'AO HSÜEH-CH'IN (b. 1715?, Chiang-ning, China—d. Feb. 12, 1763, Peking), author of *Hung lou meng* (*Dream of the Red Chamber*), generally considered China's greatest novel. A partly autobiographical work, it is written in the vernacular and describes in lingering detail the decline of the powerful Chia family and the ill-fated love between Pao-yü and his cousin Lin Tai-yü.

Ts'ao was the grandson of Ts'ao Yin, one of the most eminent and wealthy men of his time. In 1728, however, his family, which held the hereditary office of commissioner of imperial textiles in Nan-ching, suffered the first of a series of reverses and moved to Pei-ching. By 1742 Ts'ao's contemporaries reported him to be living in reduced circumstances and engaged on a work that could hardly be anything other than the *Dream*. The author had finished at least 80 chapters of the novel before his death. The work was completed by Kao Eh, about whom little is known.

**Ts'ao Chih**, Pinyin CAO ZHI, also called (Wade-Giles romanization) CH'EN SSU WANG, or PRINCE SSU OF CH'EN (b. 192, China—d. 232, China), one of China's greatest lyric poets and the son of the famous general Ts'ao Ts'ao.

Ts'ao Chih was born at the time his father was assuming command over the northern third of China, later to be named the Wei kingdom by his successor, Ts'ao P'ei, Ts'ao Chih's older brother and bitter rival.

In a family of poets—the verses of Ts'ao Ts'ao and Ts'ao P'ei were also widely known—Ts'ao Chih's talents quickly surpassed those of his father and elder brother. Indeed, Ts'ao Ts'ao was so impressed with the poetic skill that

Ts'ao Chih displayed from his earliest years that he once considered making him crown prince over the head of Ts'ao P'ei. Added to Ts'ao P'ei's resentment of Ts'ao Chih was the fact that as a young adolescent Ts'ao Chih had fallen in love with the Lady Chen, the woman who later became the consort of his elder brother. Thus, when Ts'ao P'ei ascended the throne as Emperor Wen of Wei in 220, he took pains to make his younger brother's life as difficult as possible.

Ts'ao Chih's resulting frustration and misery can be seen as a theme of much of his poetry. Writing in the then-standard five-word line, Ts'ao Chih extended and strengthened its use to make it a flexible and yet precise vehicle for the expression of his wide-ranging emotions.

**Tsao-chuang**, Pinyin ZAOZHUANG, city, southern Shantung sheng (province), China. The city includes an extensive area on the western flank of the southwestern spur of the Shantung Hills, to the east of the Grand Canal that contains one of the most important coal-mining districts of eastern China. The coal deposits, which are of high-quality bituminous coal, suitable for coking, are connected with those of Chia-wang and Suchow in northern Kiangsu sheng.

The mines were developed before World War II, and much of the production was distributed by rail and the canal to the Yangtze River valley. Under the Japanese occupation, coal production was increased, but, during the latter part of World War II, the mines were seriously damaged and ceased production.

The Tsao-chuang mines were not brought back into production until 1954. They were then extensively modernized and mechanized, and by 1957 they had equaled prewar production and later exceeded it. The nearby city of Han-chuang, which has also been a mining centre since the early 1960s, lies south of Tsao-chuang on the Grand Canal. There has been some industrial development in the region, in addition to mining. Pop. (1985 est.) 269,400.

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**Tsao Chün**, Pinyin ZAO JUN, in Chinese mythology, the Furnace Prince whose magical powers of alchemy produced gold dinnerware that conferred immortality on the diner. The Han-dynasty emperor Wu-ti was reportedly duped by Li Shao-chün, a self-styled mystic, into believing that this new deity was capable of conferring immunity from old age. Accordingly, Wu-ti offered the first sacrifice to Tsao Chün in 133 BC. A year after Li was brought to the palace, he secretly fed a piece of inscribed silk to a bull, then informed the emperor that the animal's stomach contained mysterious sayings. When Li's handwriting was recognized, the emperor ordered his execution. At that time, it was believed that Tsao Chün's chief duty was to watch over the furnace that produced gold, the means to immortality.

Han emperor Hsüan-ti (reigned 74–48/49 BC) is said to have seen Tsao Chün in human form: he called himself Ch'an Tzu-fang, wore yellow garments, and had unkempt hair cascading to his shoulders. The emperor, much impressed, sacrificed a lamb in his honour. In about the 7th century AD the similarity of names caused Tsao Chün to be identified with Tsao Shen, god of the kitchen (or hearth), who in turn was later confused with Ho Shen, the god of fire.

**Ts'ao Hsüeh-ch'in** (Chinese novelist): see Ts'ao Chan.

**Ts'ao Kuo-chiu**, Pinyin CAO GUOJIU, in Chinese mythology, one of the Pa Hsien, the Eight Immortals of Taoism, sometimes depicted in official robes and hat and carrying a tablet indicative of his rank and of his right to palace audiences. He was a man of exemplary character who often reminded a dissolute brother that though one can escape the laws of man, one cannot avoid the nets of heaven. In another tradition, however, Ts'ao is said to have been in conflict with the law but mended his ways after his release from prison was arranged by an imperial mandate.



Ts'ao Kuo-chiu, wood sculpture, 18th century; in the Musée Guimet, Paris  
By courtesy of the Musée Guimet, Paris

A legend reports that Chung-li Ch'üan and Lü Tung-pin (two of the Pa Hsien) welcomed Ts'ao into their company after a visit to his mountain hideaway. *See also* Pa Hsien.

**Ts'ao P'ei**, Pinyin CAO PEI, posthumous name (*shih*) WEN-TI, courtesy name (*tsu*) TZU-HENG (b. AD 187, Po-hsien [now in modern Anhwei province], China—d. 226, China), founder of the short-lived Wei dynasty (AD 220–265/266) during the Three Kingdoms period of Chinese history.

The son of the great Han general and warlord Ts'ao Ts'ao, Ts'ao P'ei succeeded his father as king of Wei upon the latter's death in 220. At the same time, Ts'ao P'ei formally proclaimed the end of the Han dynasty (206 BC–AD 220) and the inauguration of the Wei dynasty, of which he was the first emperor. He retired the last Han emperor with great honours and married the emperor's two daughters. He then undertook administrative reforms in his domains. Ts'ao P'ei's Wei dynasty never controlled more than the northern part of China and lasted less than 50 years.

**Tsao Shen**, Pinyin ZAO SHEN, in Chinese mythology, the god of the kitchen (god of the hearth), who is believed to report to the celestial gods on family conduct and to have it within his power to bestow poverty or riches on individual families. Because he is also a protector of the home from evil spirits, his periodic absences are thought to make the house especially vulnerable to becoming haunted at such times. Tsao Shen's identity in life and in the history of his cult are uncertain. The god of the kitchen has also been confused with Ho Shen (god of fire) and with Tsao Chün (Furnace Prince).

One belief was that at least once each month Tsao Shen departs from his place above the kitchen stove to relate to the celestist, or to

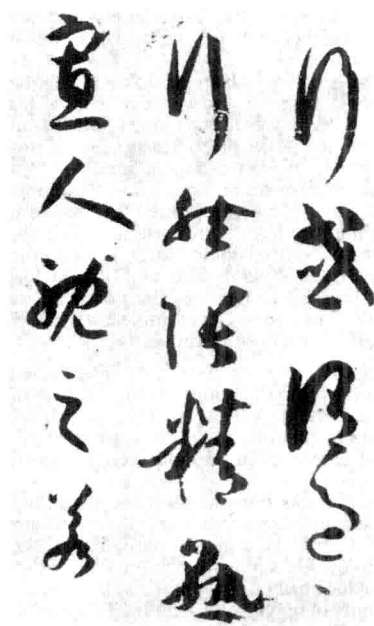


Tsao Shen and his consort, paper image designed to be fixed over the kitchen stove; in the Horniman Museum and Library, London

By courtesy of the Horniman Museum and Library, London

the city's spiritual magistrate, Ch'eng Huang (god of the wall and moat), what he has seen. It was also believed that toward the end of the 12th lunar month Tsao Shen must make an annual report to the ruler of heaven. Before the time of his departure, honey or sweet food is ceremonially smeared over the lips of the god's paper image so that only pleasant words may issue from his mouth. Offerings of food and wine are placed before the image, which is then burned along with figures of chariots, horses, money, and household utensils, all made of paper. As the new year begins, a fresh image is placed above the stove to welcome the returning deity.

**ts'ao-shu**, Pinyin CAOSHU (Chinese: "draft script," or "grass script"), in Chinese calligraphy, a cursive variant of the standard Chinese scripts *li-shu* and *k'ai-shu* (*qq.v.*) and their semicursive derivative *hsing-shu*. The script developed during the Han dynasty (206 BC–AD 220), and it had its period of greatest growth during the T'ang dynasty (618–907). In *ts'ao-shu* the number of strokes in characters are



Ts'ao-shu by Sun Kuo-t'ing (d. AD 688); in the National Palace Museum, Taipei

By courtesy of the National Palace Museum, Taipei, Taiwan, Republic of China

reduced to single scrawls or abstract abbreviations of curves and dots. Strokes of varying thickness and modulation show a great variety of shapes. *Ts'ao-shu* is not bound by rules for even spacing, and characters need not be of the same approximate size; the calligrapher thus has the fullest freedom of expressive movement of line. *K'uang* ("crazy") *ts'ao-shu* is an extremely wild and illegible form.

**Ts'ao Ts'ao**, Pinyin CAO CAO, courtesy name (*tsu*) MENG-TE (b. AD 155, Po-hsien [in modern Anhwei province], China—d. 220, Lo-yang [in modern Honan province]), one of the greatest of the generals at the end of the Han dynasty (206 BC–AD 220) of China.

Ts'ao's father was the adopted son of the chief eunuch of the imperial court. Ts'ao was initially a minor garrison commander and rose to prominence as a general when he suppressed the Yellow Turban Rebellion, which threatened the last years of Han rule. The dynasty, however, was greatly weakened by the rebellion, and in the ensuing chaos the country was divided among the major generals into three kingdoms. Ts'ao occupied the strategic northern section around the emperor's capital at Lo-yang and gradually assumed all imperial prerogatives. His domain was known as the kingdom of Wei.

Ts'ao's large armies—at one time he is said to have had a million men under arms—and his skillful maneuvering have long been notorious in Chinese history. He was described by Confucian historians and in popular legends as the archetypal shrewd, bold, unscrupulous villain. He was portrayed in this role in the great 14th-century historical novel *San Kuo chih yen i* (*Romance of the Three Kingdoms*), and since then he has been one of the most popular figures of Chinese legend and folklore, with various evil magic powers ascribed to him. Modern historians tend to view Ts'ao as a skillful general and pragmatic politician. After Ts'ao's death the last Han ruler, Hsient'i, ceded the throne to Ts'ao's son Ts'ao P'ei, who proclaimed the Wei dynasty (220–265/266).

*A list of the abbreviations used in the MICROPAEDIA will be found at the end of this volume*

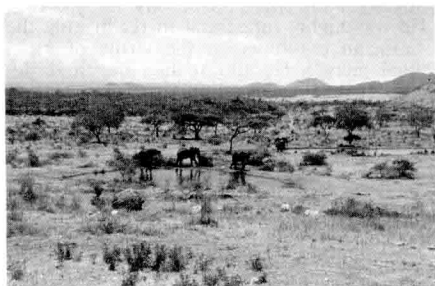
**tsar**, also spelled TZAR, or CZAR, English feminine TSARINA, TZARINA, or CZARINA, title associated primarily with rulers of Russia. The term tsar, a form of the ancient Roman imperial title *caesar*, generated a series of derivatives in Russian: *tsaritsa*, a tsar's wife or tsarina; *tsarevich*, his son; *tsarevna*, his daughter; and *tsesarevich*, his eldest son and heir apparent (a 19th-century term).

In medieval Russia the title tsar referred to a supreme ruler, particularly the Byzantine emperor and, after about 1240, the Mongol khan. Ivan IV the Terrible, grand prince of Moscow, assumed the title in 1547; as tsar, theoretically he held absolute power, but in practice he and his successors were limited by the traditional authority of the Orthodox church, the Boyar Council, and the legal codes of 1497, 1550, and 1649. In 1721 Peter I officially changed the title to *imperator* (Latin: "emperor"), the traditional epithet of victorious Roman generals, to reflect his successful efforts to expand Russian domination. The rulers of Russia, however, continued to be called "tsar" in popular usage until the imperial regime was overthrown by the Russian Revolution of 1917. The early Bulgarian emperors (10th to 14th century AD) and the 20th-century kings of Bulgaria (from 1908 to 1946) also called themselves tsars.

**Tsaritsyn**, also formerly STALINGRAD (city, Russia): *see* Volgograd.

**Tsarskoye Selo** (city, Russia): *see* Pushkin.

**Tsavo National Park**, national park, south-eastern Kenya, east of Mount Kilimanjaro. It was established in 1948 and is the largest (8,036 square miles [20,812 square km]) of Kenya's national parks. Drained by the Tsavo



Elephants at water hole in Tsavo National Park, Kenya

Carl Purcell

and Galana rivers, and the Tiva River in the north, the park comprises semiarid plains covered by dormant vegetation (which bursts into luxuriant bloom after a light rain) and acacia and baobab trees. It is divided into two areas: the relatively flat Tsavo East and the volcanic Tsavo West, which is dotted with springs and water holes. Wildlife includes elephants, as well as lions, rhinoceroses, buffalo, hippopotamuses, hartebeests, several species of antelope, and hundreds of species of birds. Poaching, particularly for rhinoceroses, and brush fires are constant problems. The park is bisected by the Nairobi-Mombasa highway and railway line.

**Tschaikovsky, Pyotr Ilyich** (composer): see Tchaikovsky, Peter Ilich.

**Tschermak von Seysenegg, Erich** (b. Nov. 15, 1871, Vienna, Austria—d. Oct. 11, 1962, Vienna), Austrian botanist, one of the co-discoverers of Gregor Mendel's classic papers on his experiments with the garden pea.

Tschermak interrupted his studies in Vienna to work at the Rotvorwerk Farm near Freiberg, Saxony. He completed his education at the University of Halle, receiving his doctorate in 1896. After working a few years at several seed-breeding establishments, he joined the staff of the Academy of Agriculture in Vienna in 1901. There he spent practically his entire teaching career, attaining the position of professor in 1906.

In the spring of 1898 Tschermak began breeding experiments on the garden pea in the Botanical Garden of Ghent. The next year he did volunteer work at the Imperial Family's Foundation at Esslingen near Vienna and continued his experiments on peas in a private garden. While writing the results of his experiments, Tschermak saw a cross-reference to Mendel's work and had the papers sent to him from the library of the University of Vienna. He found that Mendel's work with the garden pea duplicated and in some ways superseded his own. In the same year (1900) that Tschermak reported his findings, Hugo de Vries and Carl Erich Correns also reported their discovery of Mendel's papers.

An outstanding plant geneticist, Tschermak applied Mendel's rules of heredity to the development of new plants such as Hanna-Kargyn barley; wheat-rye hybrids; and a fast-growing, disease-resistant oat hybrid.

**Tscherning, Anton Frederik** (b. Dec. 12, 1795, Frederiksværk, Den.—d. June 29, 1874, Copenhagen), military reformer and radical champion of democracy in mid-19th-century Denmark.

While still an artillery officer in the Danish army, Tscherning developed a hatred for his country's absolutist regime. Leaving the mili-

tary in the early 1840s, he became a founder in 1846 of the Society of Friends of the Peasant, a political reform organization of urban and agrarian intellectuals; he served as its chairman from 1846 to 1856. Following the liberal nationalist demonstrations of March 1848 that forced the king to call for a limited constitutional monarchy, Tscherning was named war minister in the new government. Reflecting popular demand, it immediately engaged Denmark in the Schleswig War (1848–50) for the annexation of the duchy of Schleswig. Serving as war minister until November 1848, Tscherning successfully reorganized the army, though he was less fortunate in directing field operations. He sat in Parliament from 1849 to 1866 and in the State Council from 1854 to 1864, at all times urging greater democratic participation, agrarian reform, free trade, and reduction of civil service expenditure.

In the early 1860s Tscherning spoke out against the National Liberal government's chauvinistic policy of incorporating Schleswig into the state, breaking with most of the peasant party on that issue. After the disastrous Danish-German War (1864), he again led the democratic forces in unsuccessful agitation against the restrictive 1866 reform of membership in the upper chamber of Parliament.

**Tschudi, Gilg**, also called AEGIDIUS (b. Feb. 5, 1505, Glarus, Switz.—d. Feb. 28, 1572, Glarus), Swiss humanist and scholar, the author of a chronicle of Swiss history that was used as a source by many subsequent writers, including Friedrich Schiller.

Though a pupil of the religious reformer Huldrych Zwingli, Tschudi remained a convinced and militant Roman Catholic; and his efforts to eliminate the Zwinglians came to be known as the *Tschudikrieg* ("Tschudi's War"; 1558–64). After holding several administrative posts, he became chief magistrate of Glarus.

Tschudi's enduring importance rests especially on the *Chronicon Helveticum*, 2 vol. (1734–36), a "Swiss Chronicle" covering the years 1000–1470. Many assiduously collected documents were incorporated in it; others were fabricated, in an attempt to give a coherent and comprehensive chronology. His chronicle was the leading authority until the 19th century, when much of his work was found to be spurious. Consequently, his reputation as a historian suffered, but the literary aspect of his work is still justly admired. His other works include two accounts of ancient Helvetia.

**Tsederbaum, Yuly Osipovich:** see Martov, L.

**Tsegaye, Gabre-Medhin**, also called TSEGAYE GABRE-MEDHIN (b. Aug. 17, 1936, Ambo, Eth.), Ethiopian playwright and poet who wrote in Amharic and English.

Tsegaye earned a degree from the Blackstone School of Law, Chicago, and studied stagecraft at both the Theatre Royal, Windsor, and the Royal Court Theatre, London. In Ethiopia he was director of the Haile Selassie I Theatre (now the National Theatre).

Tsegaye wrote more than 20 plays, most of them in Amharic, and translated a number of plays of William Shakespeare and Molière into that language as well. His Amharic plays deal primarily with contemporary Ethiopia, especially with the plight of youth in urban settings and the need to respect traditional morality, as in *Crown of Thorns* (1959).

*Oda Oak Oracle* (1965) is Tsegaye's best-known verse play written in English. Like his other English plays, it is based on Ethiopian history and focuses on religious conflict. *Collision of Altars* (1977) is an experimental play that includes mime, incantation, dance, and the use of masks. Tsegaye's English poetry appeared in Ethiopian journals and was included in several anthologies of African poetry, including *New Sum of Poetry from the Negro World* (1966).

**Tselinograd**, also spelled CELINOGRAD, *oblast* (province), northern Kazakhstan, with an area of 48,100 square miles (124,600 square km). Known as Akmolinsk *oblast* until 1961, it lies in the steppe zone in the northwest Kazakh Upland and is drained by the Ishim and Nura rivers. In the southwest are Lakes Tengiz and Kurgaldzhin. The terrain is mainly rolling plain, with black earth and chestnut soils in the north and centre and saline brown soils in the extreme southwest and east. The climate is continental and dry, with an average annual precipitation of only 12 inches (300 mm).

The *oblast* is a major producer of grain (wheat, oats, and barley) and livestock products, with animal husbandry, particularly sheep raising, dominant in the drier southwest and northeast and crop cultivation in the centre. The chief industries are engineering, mining, building materials, and food processing. Urban communities include Tselinograd city, the capital, Atbasar, Makinsk, Stepnogorsk, and Alekseyevka. The Scientific Research Institute for Grain Farming is at Shortandy. The population consists mainly of Russians, Kazakhs, Germans, and Ukrainians. Pop. (1991 est.) 793,900.

**Tselinograd**, also spelled CELINOGRAD, formerly (until 1961) AKMOLINSK, city and administrative centre of Tselinograd *oblast* (province), north-central Kazakhstan. It lies along the Ishim River at the junction of the Trans-Kazakhstan and South Siberian railways. Known as Akmolinsk (Kazakh *akmola*, "white tomb") until 1961, it was founded in 1824 as a Russian military outpost and became an administrative centre in 1868. Its population had reached 33,000 when it was made an *oblast* centre in 1939.

The Soviet Virgin and Idle Lands Campaign in the mid-1950s—Tselinograd is Russian for Virgin Lands City—and the city's role as capital of a *krai* (region) that united the five northern *oblasti* of Kazakhstan in 1960–65 greatly enhanced its importance and led to much new construction and the setting up of various research and higher educational institutions (teacher training, agriculture, medicine, and engineering and construction). Most of the population is employed in transport, particularly by the railways. Various types of agricultural machinery are also produced. Pop. (1991 est.) 286,000.

**Ts'en Shen**, also called TS'EN CHIA-CHOU, Pinyin CEN SHEN, or CEN JIAZHOU (b. 715, Nan-yang [Chiang-ling], China—d. 770, Ch'eng-tu, Szechwan province), one of the celebrated poets of the T'ang dynasty (618–907) of China.

Because of the decline of his aristocratic family, Ts'en had to rely upon his literary skill to secure government appointment through the examination system. During the 750s he held several assignments in the central Asian outposts of the far-flung T'ang empire until the eruption of the An Lu-shan Rebellion of 755 forced his return to China. Having supported the loyalist cause, he succeeded to a number of provincial posts under the restoration until his retirement in 768.

A member of the second generation of High T'ang poets, which included such masters as Li Po and Tu Fu, Ts'en participated in the effort to reinvigorate the *lü-shih*, or "regulated poem," through innovations in diction and metre. Contemporaries praised him for his stylistic craftsmanship, particularly his skill at creating unconventional metaphors and imaginative phrases. But he came to be best known as a "frontier poet" because he so frequently set his poems in the exotic central Asian locale that he had experienced firsthand in the midst of his career.