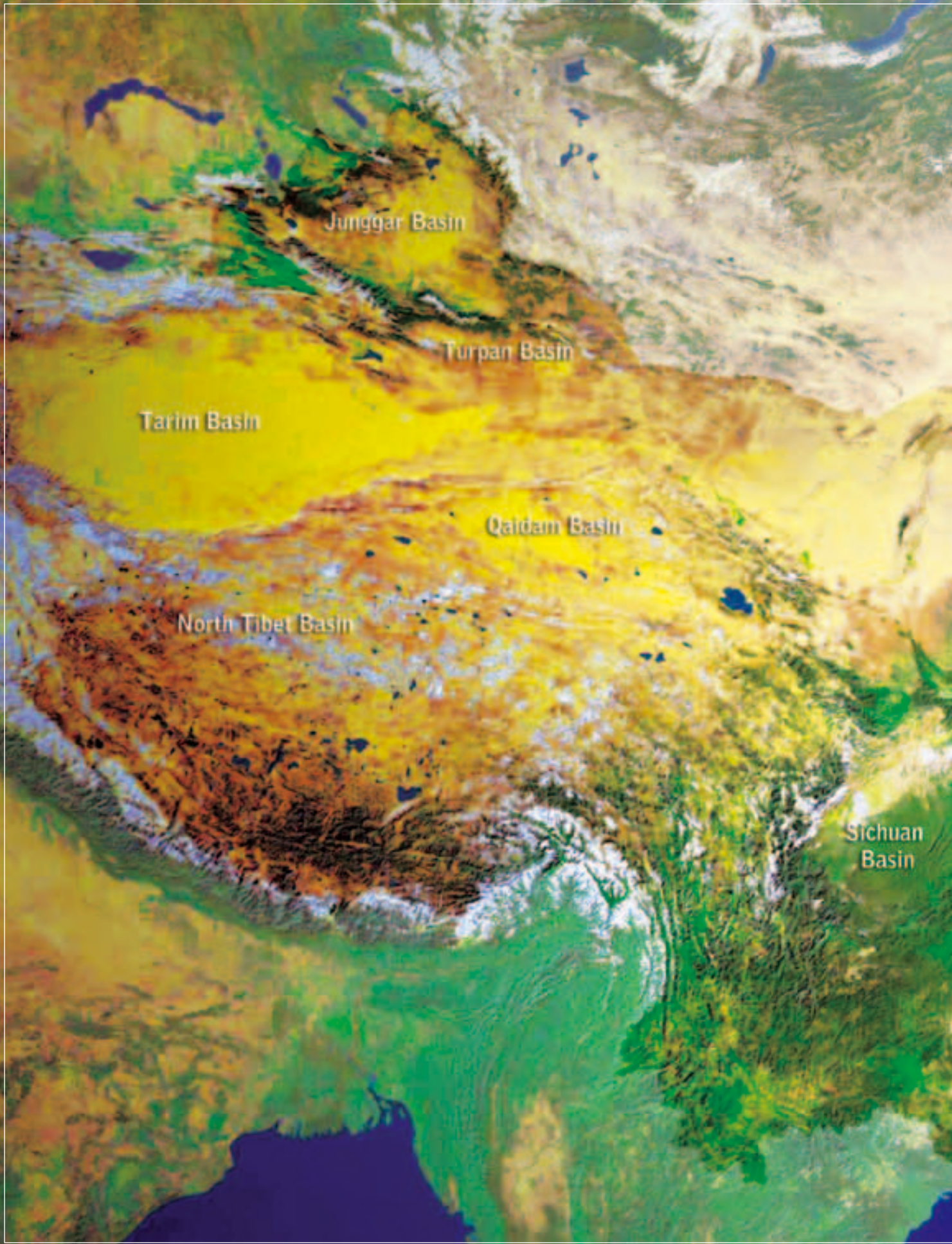


Qaidam Basin



China National Petroleum Corporation



Junggar Basin

Turpan Basin

Tarim Basin

Qaidam Basin

North Tibet Basin

Sichuan Basin

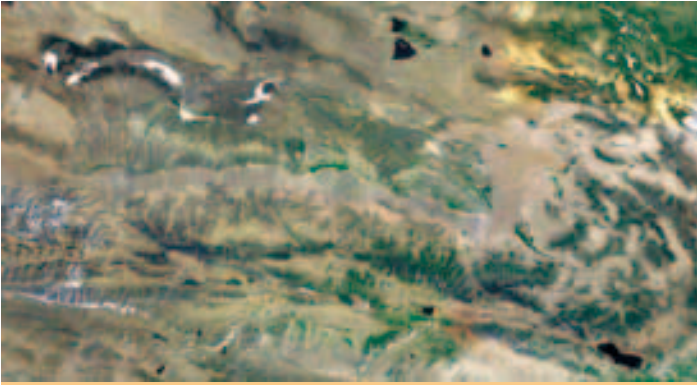


Spread across the vast territory of China are hundreds of basins, where developed sedimentary rocks originated from the Paleozoic to the Cenozoic eras, covering over four million square kilometers. Abundant oil and gas resources are entrapped in strata ranging from the eldest Sinian Suberathem to the youngest quaternary system. The most important petroliferous basins in China include Tarim, Junggar, Turpan, Qaidam, Ordos, Songliao, Bohai Bay, Erlian, Sichuan, North Tibet, South Huabei and Jiangnan basins.

There are also over ten mid-to-large sedimentary basins along the extensive sea area of China, with those rich in oil and gas include the South Yellow Sea, East Sea, Zhujiangkou and North Bay basins.

These basins, endowing tremendous hydrocarbon resources with various genesis and geologic features, have nurtured splendid civilizations with distinctive characteristics portrayed by unique natural landscape, specialties, local culture, and the people.

In China, CNPC's oil and gas operations mainly focus in nine petroliferous basins, namely Tarim, Junggar, Turpan, Ordos, Qaidam, Songliao, Erlian, Sichuan, and the Bohai Bay.



Qaidam Basin is China's highest and most evaporative inland basin situated in the border area of the provinces of Qinghai, Gansu and the autonomous region of Xinjiang. The basin lies in a crescent valley surrounded by plateaus and the mountains of Altyn-Tagh, Qilian and Kunlun. Stretching 800 kilometers from the east to the west and up to 350 kilometers from the north to the south, the basin covers an area of 250,000 square kilometers. At an altitude of 2,600~3,000 meters, the basin slopes down from northwest to southeast, with annual evaporation up to 3,700mm.

Qaidam Basin

More than 1 billion years ago, Qaidam Basin was an integral part of North China geologic unit. At the beginning of the Eopaleozoic era (about 560 million years ago), it was separated and surrounded by shallow sea as a result of plate disintegration. At the end of the Eopaleozoic era (about 400 million years ago), the basin began to uplift due to the intense tectonic movement caused by plate subduction and collision, and later became a land 200 million years ago. Beginning in the Neogene Period, Qaidam Basin was completely separated from the ancient Mediterranean Sea and became a typical inland basin as a result of the fast uplift of the Qinghai-Tibet Plateau. With the high mountains blocking the monsoon from the Indian Ocean, the Pacific Ocean, and the Mediterranean Sea, its ecological environment changed from forest steppe to desert steppe. After the water evaporated, large amount of salts and rare metals converged and ultimately formed salt lakes.





Qaidam Basin is divided into three blocks by the form of its substrate, namely, Mangya depression, northern-margin fault block zone, and the new Sanhu (three lakes: Tajinar Lake, Suli Lake, and Dabsan Lake) depression. All the discovered above-ground structures and underground buried structures are distributed in these three blocks in lines, in belts, and in squares. The Cenozoic sedimentary rocks in the basin are up to 15,000 meters in thickness. Abundant oil and gas resources are contained in the oil- and gas-bearing Jurassic and Tertiary formation series and the gas-bearing Quaternary formations from the bottom up.

“Qaidam” means “salt pond” in the Mongolian language. The basin boasts flat terrain, with sufficient surface and ground water, and big temperature difference day and night. Regularly graduated from the edge to the center, the basin relief appears concentric rings of diluvial gravel fan (Gobi), alluvial-diluvial silty sand plain, lacustrine-alluvial silty clay plain, and lacustrine sludge solonchak plain. In the low-lying area are widespread distributed many salt lakes and swamps. Rivers are mostly distributed in the eastern part, and the western part has only sparse waters. The Yadan landform appears magnificent in a close view. Dozens of salines, the largest of which is Charhan, are star-studded in the basin and build a crystal salt world. The basin entraps abundant petroleum and numerous valuable minerals. All these entitle Qaidam Basin an authentic “treasure basin” on the Qinghai-Tibet Plateau.



The landscape of Qaidam Basin features arid desert with the major soil types of Solonchaks and Gypsisols. Meadow soil and swampy soil are typically salinized, and gypsisols are mainly distributed in the western part of the basin. The open vegetation consists of not too many kinds of plants, most of which are halophytes of highly drought-resisting shrubs, half shrubs, and herbs. Dense sedges form grass dunes along shores of salt marshes, salt lakes, and rivers. Reed and wild rye compose of the main vegetation in salt lakes and swamp periphery.

Three Rivers' Head Source

The Three Rivers' Head Source, the origin of the Yangtze River, the Yellow River, and Lancang River, is situated deep in the Qinghai-Tibet Plateau. The area is surrounded by the Kunlun Mountains to the north, Hohxil to the west, Bayan Har Mountains to the east, and Tanggula Mountains to the south. Covering 363,000 square kilometers, the area is more than 4,000 meters above sea level on average and boasts more than 2,000 peaks, most of which are jokuls and glaciers. Totaled to more than 5,000 square kilometers in area, these glaciers store approx. 400 billion cubic meters of water. The lakes cover more than 5,000 square kilometers.



The source area of the three rivers is the typical representative of the Qinghai region, with its primitive natural landscape that features great mountains, rivers, grasslands, jokuls, wetlands, and animal sanctuary, a collection of Tibetan Buddhism culture, Tang-Tibet ancient road, Yushu folk dance, and horse racing festival. In fact, it boasts ten national intangible cultural heritages of China, some of which are the Yushu folk dance, Yushu horse racing festival, and Yushu Tibetan clothes.

The nature reserve of the Three Rivers' Head Source was established by Qinghai Province in May, 2000, and became a state-level reserve in January, 2003.







Qinghai Lake

Qinghai Lake means a “blue lake” in Chinese. It is located to the west of Xining, the capital city of Qinghai Province, at 3,195 meters above sea level. With an area of 4,583 square kilometers, it is the largest inland lake and salt lake in China.

Qinghai Lake lies in a cradle of four mountains that are connected to the lakeside by vast, flat grassland. In fact, this blue lake forms a fascinating commanding view together with the mountains and grassland.

The famous Bird Island is located in the west of Qinghai Lake. Every spring, about 100,000 migratory birds of more than ten species come to live on this 0.5 square kilometer of area from southern China, Southeast Asia, and Indian peninsula, presenting a considerable population density.





Charhan Salt Lake

Charhan Salt Lake, like a valuable pearl at the bottom of the basin, is the largest salt lake in the world. It covers 5,856 square kilometers, 6 times as large as the Dead Sea in the Middle East and more than 50 times as large as the Searles Lake in California. The lake contains more than 50 billion tons of sodium chloride, which can accommodate for all the 6 billion people in the world for 1,000 years. In addition, it boasts associated minerals of magnesium, lithium, boron, and iodine, and abundant resources of sylvite.

The lake lies in the city of Golmud and the county of Dulan, Qinghai province. It receives water from Golmud River, Qaidam River, and other inland rivers. Water evaporation is much more than precipitation due to the dry and hot climate and long hours of sunshine. The long weathering forms dense saline in the lake. When salt grains crystallize from the saline, a hard salt cap as thick as 3~4 meters is generated.

When it is sunny and windless, the wavy lake, surrounded by a vast, flat and tranquil desert, is like a tilled land or fish scales, or a huge mirror emitting silver light beams and steam.





Yadan Landforms

Qaidam Basin is known to the world for its Yadan Landforms. "Yadan" means a "precipitous hillock" in the Uyghur language. These unique aeolian landforms are also called "wind-carved forests" or "sandstone forests". Large areas of "Yadan" clusters have been formed as a result of regional Aeolian development at Nanbaxian, Huangfanliang, and Dafengshan regions in the western part of the basin.

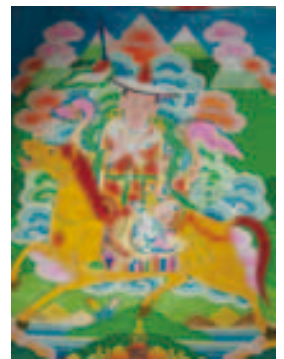
After Tertiary formations were raised by folds, broken by faults, and exposed as a result of billion years of geological events, some surface substances were deflated under the effect of long exogenic process, creating diversified monadnocks and trough-shaped lowlands. On the salt marsh of the basin, fractures in the salt marsh became larger over time under intense wind erosion. As such, the flat ground surface was developed into many irregular ridges and troughs that extended in the prevailing wind direction. When the troughs became larger and ridges became smaller, discrete mounds appeared and formed the unique Gobi wonders. In a distant view, these mounds are of various amazing shapes. Some may look like horses, camels, lions, tigers, or whales, and others like ancient castles, imperial tombs, or tents.



Kumbum Monastery

Kumbum Monastery is located 25 kilometers southwest of Xining, the capital city of Qinghai Province. This more than 600 years old monastery was first built in 1379 A.D. and occupies an area of over 40 hectares. As the birthplace of Tsongkhapa, the founder of Gelug (Yellow Hat) Sect of Tibetan Buddhism, it is one of the top-six monasteries of the Sect in Tibet.

Kumbum is a repository of Tibetan religion, culture, and arts. Its unique and carefully arranged architecture is not only dignified but also rich-colored. The renowned "three unique arts", namely, butter sculpture, fresco (Thangka), and barbola (embossed embroidery), are miracles of Tibetan arts. Throughout Kumbum's 400,000 square meters of area sit more than 9,300 halls and monastic living quarters as well as 52 Buddha shrines, where more than 80 Tulkus (Living Buddha) and 3,600 lamas resided at its zenith. The "Golden Tiled Temple" is the heart of the monastery.





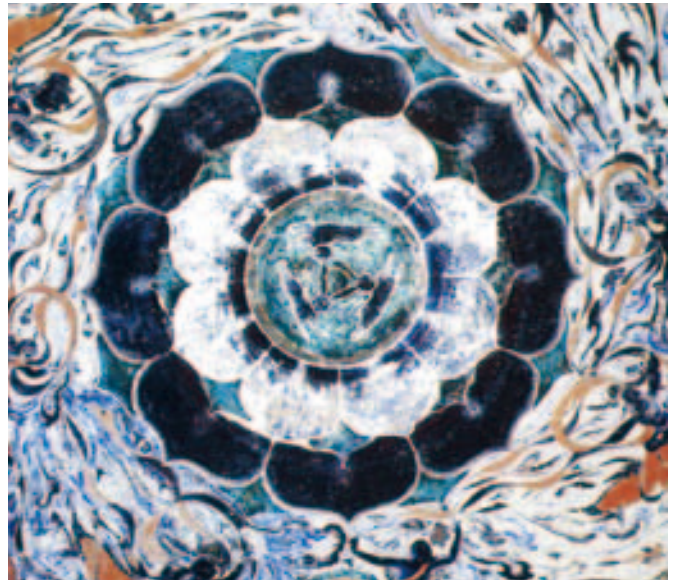
Mogao Grottoes

The Mogao Grottoes, also known as "Thousand Buddha Caves", is located on the Rattling Sand Mountain (mingsha shan) of Dunhuang County in Gansu Province, China. It is one of three noted grottoes in China for its fabulous frescos and statues.

The construction of the Mogao Grottoes began in the period of the Sixteen Kingdoms (about 366 A.D.), and the endeavor continued through the later dynasties, including the North Dynasty, Sui, Tang, Five Dynasties, Western Xia and Yuan. Today, the grand dimension of the site is shown by 735 caves, with murals covering 45,000 square meters and colored clay statues of 2,415 square meters. It is the largest and richest extant treasure house of Buddhist art in the world.

Located on the precipice of the Rattling Sand Mountain, the caves are divided into south section and north section. The south section, as the main part of the Mogao Grottoes, is for religious activities of monks. Each cave contains wall paintings or sculptures in this section. The north section is the area in which the monks live, cultivate themselves according to the religious doctrine and bury the deceased peers. There are only five caves containing frescos or statues in this section.

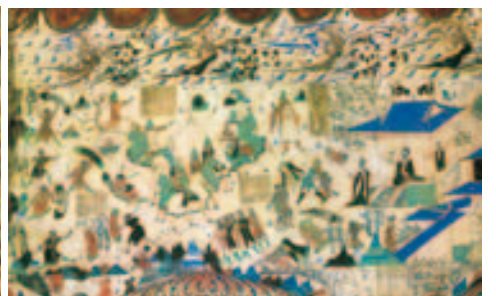
The soft soil of the caves' location is unsatisfactory to produce stone statues. Thus, the majority of statues in the grottoes are wooden-body clay statues with the exception of four big stone-body clay statues of Buddha. Whether in single or group forms, the Buddhist figures are so delicately made and life-like that they become a harmonious integration with the surrounding murals. Frescos can be seen on the walls and ceilings of caves and inside the niche for Buddha. The motif of these paintings covers a wide range with profound depth, such as joss, Buddhist stories, spirits, and decorative patterns. Social lives during that age are also displayed in the murals, including hunting, farming, spinning, transportation, battle, construction, dancing, wedding and funeral. Some paintings are bold and broad in style while others are magnificent with resplendent colors, reflecting the artistic styles and features in different periods.



Apart from those refined sculptures and murals, the caves were also constructed exquisitely in varied forms and sizes. The largest one, No. 16 Cave, covers 268 square meters while the smallest one, No. 37 Cave, is only 20-30 cm in height. Outside the grottoes, there were wooden temples connected with corridors and plank roads in early days. However, they were not fully preserved and can be barely seen today.

In modern times, the Cave of Buddhist Scriptures was accidentally discovered and the Mogao Grottoes re-attracts attention from all over the world. Tragically, a large amount of rare scriptures were stolen. A new branch of international studies, the Dunhuang Studies, has come into being for the research on scriptures of this cave and Dunhuang's art.

In 1961, the Mogao Grottoes was listed among the first group of Cultural Relics of National Importance under the Protection of the State by the State Council, and it was listed among the World Cultural Heritage Sites in 1987.



Dunhuang Murals

Flying Apsaras are the characters in the world-renowned Dunhuang murals. They are treasures and fruits of Chinese Buddhism culture and arts, and artistically reflect how the traditional Chinese culture has been combined with Chinese dreams.

Flying Apsaras came to Dunhuang when the first cave of Mogao Grottoes was excavated in 366 A.D. by Buddhist monk Lezun in Sanwei Mountain. As the legend says, the monk of the Former Qin Kingdom made his decision after travelling to this place in the Gobi of western China and taking a splendid view here. The Flying Apsaras either fly in the sky, or descend on color clouds. Some are waving their arms and rising into the air with their heads high; others are dancing and playing the Chinese lute, Konghou, flute, and harp. These ethereal spirits wave long bands like lotus flowers flying in the sky. Their amazingly unrestrained figures have far-reaching effect on later paintings.

More than 5,400 Flying Apsaras have been painted in over 270 of the 492 caves at Mogao Grottoes, which had been built over a period of more than 1,000 years across eight dynasties from Eastern Jin Dynasty / Sixteen Kingdoms to the end of Yuan Dynasty. In Northern Wei Dynasty (386~534 A.D.), the Apsaras painted are mostly as thin and slim as cranes. In Sui Dynasty (581~618 A.D.), the Apsaras were painted most widely not



only in grottoes and temples, but also in imperial palaces. When it came to Tang Dynasty, Apsara images matured to a level never known before. In this period, they featured plumped cheeks, graceful figures, free movements, and unconstrained spirit. Seeing their vivid and elegant shapes, you can imagine clothes fluttering in breeze and the heavenly harmony of music. These diversified and charming figures exactly reflect the love and freedom that human has dreamed for thousands of years.

Nowadays, Flying Apsaras appear in books, artworks, sculptures, paper-cuttings, packages, and TV ads. In fact, they have become art images as popular as dragons, phoenixes, and stone lions in China and a good part of the world cultural heritages.





Tibetan



Mongolian



Salar



Tu

Top-4 Minorities in Qinghai Province

Tibetans account for most of the minority population in Qinghai Province, which is one of the major homes of Tibetans in China. Tibetans are good performers of smooth and rhythmic songs and graceful and bold dances. Horse racing, yak racing, archery, and mountain climbing are among of their favorite traditional sports.

In Qinghai Province, Mongolians mainly inhabit in Haixi Mongolian and Tibetan Autonomous Prefecture and Henan Mongolian Autonomous County. They are strict with etiquette. All their families would welcome visitors outside of their yurts and treat the visitors with “Huorenmu” (whole-sheep banquet) and their traditional koumiss (fermented mares' milk) beverage. Mongolians are friendly, energetic and keen of dancing and singing. On the Nadam Fair held every July and August on the grassland, they make oxen and sheep ready for food,

drink, and sing, and indulge in archery, target practice, horse racing, and wrestling.

The Salar people mainly inhabit in the Xunhua Salar Autonomous County. Their living customs are similar to that of the Hui nationality but have their unique characteristics. Historians have proved that Salars' ancestors migrated from the Central Asian Samarkand and settled at the present Jiezi Township of Xunhua more than 700 years ago. However, the nationality was made mysterious by many impressive folk tales told thereafter.

Tu is one of the oldest nationalities on Qinghai Plateau. Its diligent, honest, and hospitable people are good singers and graceful dancers. They are mainly occupied with agriculture in addition to raising stocks. Delicate embroideries created by Tu's women are a spectacular indicator of their traditional culture.

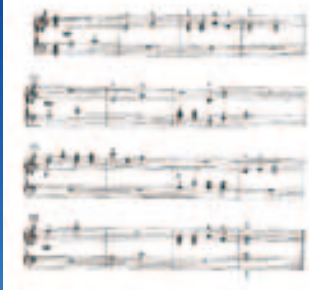
Presenting Hadas

Hada is a “present scarf” of Tibetan. It was originally a precious gift presented to deities in rituals of Tibetan religions or between monks or to the Tulku. With the development of society and economy, it has gone beyond the religious community and become the commonest gift in daily life of Tibetans. In Tibetan regions, presenting Hadas is a common and grand ceremony to show purity, sincerity, loyalty, and respect on weddings, funerals, folk festivals, visiting elders, receiving and parting with guests, pilgrimage, communication, entreating, house completion, and apologizing.



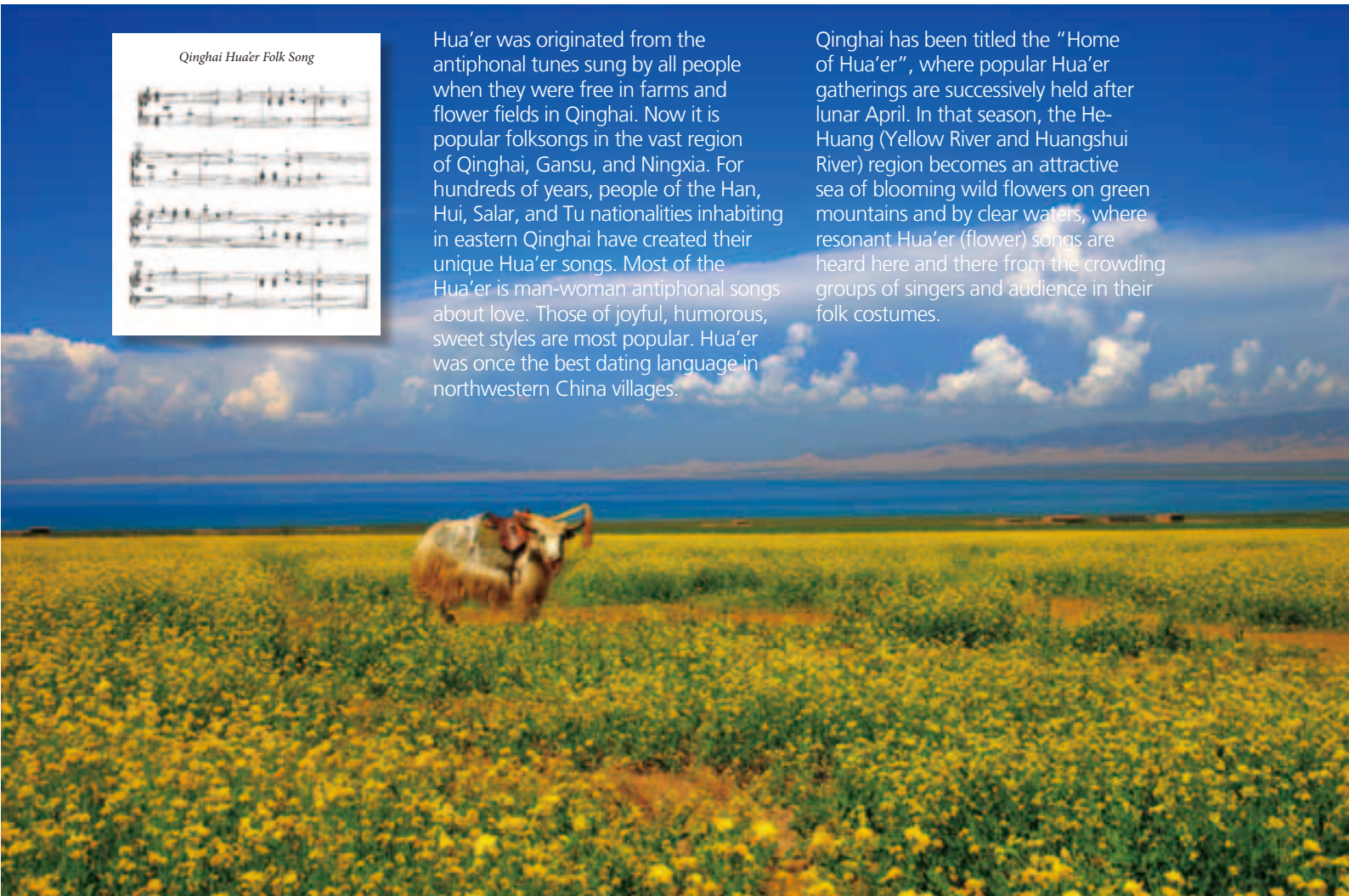
Qinghai Hua'er Folk Song

Qinghai Hua'er Folk Song



Hua'er was originated from the antiphonal tunes sung by all people when they were free in farms and flower fields in Qinghai. Now it is popular folksongs in the vast region of Qinghai, Gansu, and Ningxia. For hundreds of years, people of the Han, Hui, Salar, and Tu nationalities inhabiting in eastern Qinghai have created their unique Hua'er songs. Most of the Hua'er is man-woman antiphonal songs about love. Those of joyful, humorous, sweet styles are most popular. Hua'er was once the best dating language in northwestern China villages.

Qinghai has been titled the “Home of Hua'er”, where popular Hua'er gatherings are successively held after lunar April. In that season, the He-Huang (Yellow River and Huangshui River) region becomes an attractive sea of blooming wild flowers on green mountains and by clear waters, where resonant Hua'er (flower) songs are heard here and there from the crowding groups of singers and audience in their folk costumes.







Qaidam Basin is China's highest onshore base of oil production and supply. It is also one of the Chinese regions where petroleum exploration was first initiated, with the large-scale hydrocarbon exploration and development beginning in 1950s and leading to the discovery of Youquanzi, Lenghu, and Mahai structures. From 1960s to 1970s, it witnessed new breakthroughs in hydrocarbon exploration with the discovery of Sebei Gas Field and Gasikule Oilfield. After more than five decades of development, Qaidam's oil and gas development plays an irreplaceable role in promoting social and economic development on the Qinghai-Tibet Plateau.

Qinghai Oilfield

Qinghai Oilfield is one of the earliest oilfields developed after the foundation of new China, with its exploration initiated in 1954. Its Lenghu Oilfield was born when well Dizhong-4 being drilled in the Lenghu structure achieved intense blowout in 1958. In 1977, an uncompartamentalized Gasikule Oilfield with 100 million tons of oil in place was discovered in the southwestern part of the basin, representing a new breakthrough of exploration. By far, 347.65 million tons of oil and 306.6 billion cubic meters of natural gas in place have been accumulatively proven in Qinghai Oilfield. After more than five decades of construction, Qinghai Oilfield has completed three works, namely, the 1.2Mt/a Gasikule Oilfield, the 436km-long Huatugou-Golmud oil pipeline, and the 1Mt/a Golmud Refinery, in addition to three bases at Dunhuang, Golmud, and Huatugou. In fact, it has become an important energy and chemical base in Gansu, Qinghai, and Tibet.

Qinghai Oilfield has annual oil production capacity of 2.03 million tons and natural gas production capacity of 8.55 billion cubic meters, thanks to a series of main oilfields and gas fields, such as Gasikule, Yuejin-2, and Huatugou oilfields and Sebei-1, Sebei-2, and Tainan gas fields. Six gas pipelines and the Huatugou-Golmud oil pipeline totaled to 3,159 kilometers in length can transport 3 million tons of oil and 10.7 billion cubic meters of gas per year. The Golmud Refinery can process 1 million tons of oil and produce 400,000 tons of methanol annually. The gas from the Sebei Gas Field has been delivered to the cities of Xining, Lanzhou, and Yinchuan through pipelines.



Gasikule Oilfield



Discovered in 1958, Gasikule Oilfield was an underground buried structure in the east of Gasikule Lake in the southern block of west Qaidam Basin. The oilfield covers an oil area of more than 30 square kilometers, bearing oil in anticlinal traps of fault cut. Its two oil-bearing layers, one of the Palaeogene and the other of the Neogene, boast high pressure, sound physical properties, and light oil that translate to high production per individual well. In 1992, its annual production reached a record high of more than 1 million tons, making it the first 1Mt/a oilfield on the Qinghai-Tibet Plateau.

Sebei Gas Field



Sebei Gas Field stands by the Senie Lake in east Qaidam Basin, 2,750 meters above sea level on average. As CNPC's 4th largest onshore gas field, It is the gas source of Sebei-Xining-Lanzhou Pipeline and one of the major strategic replacement gas sources of the West-East Gas Pipeline. With the development initiated in 1974, the gas field has developed a 4.963bcm/a gas capacity and accumulatively produced 11.659 billion cubic meters of gas.

Golmud Refinery

Golmud Refinery is only 1Mt/a refinery on the Qinghai-Tibet Plateau, 2,850 meters above sea level. In June, 1999, this refinery completed three gas chemical units, including a 100kt/a methanol unit, a 100kt/a gas fractionator, and a 20kt/a PP unit. As such, more profit can be made from the advantageous resource at a place near to the source, and the refinery is upgraded from a fuel-type refinery to the one of fuel-chemical type. Now the plant produces refined products, chemical products of PP, methanol and benzene, and byproducts of LPG, oxygen, nitrogen, and hydrogen to support the growth of circular economy in Qaidam Basin.



Huatugou-Golmud Oil Pipeline

The Huatugou-Golmud Oil Pipeline primarily transports oil to Golmud Refinery. With an average elevation of 2,900 meters, it is one of the highest long-distance oil pipelines in the world. The 436km-long pipeline mostly runs through desert, Gobi, swamps, and salt marshes. With a diameter of 273 mm, it is designed to transport 1 million tons of oil. Its construction lasted from June 1, 1988 to October, 1989. Standing along its route are the Huatugou initial station, Golmud terminal station, and six midway pump stations of Dawusi, Mangya, Gansen, Wutumeiren, Zhongzaohuo, and Tuolahai. In 2002, Qinghai Oilfield began to install the 439km-long Parallel Huatugou-Golmud Oil Pipeline. The parallel line, 355mm in diameter, is designed to transport 2-3 million tons of oil per year and was put into production in August 1, 2004.







Qaidam Basin



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