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Abstract: Human origins have always been a hot topic of research in academia, focusing on the controversy between "single African origin" and "multiregional evolution." The evolution from ancient ape to modern humans was a complex process, which required the co-existence of diverse favorable factors. Based on a review of existing research findings, this paper argues that modern humans originated in the Himalayas and presents multi-dimensional evidence from the perspectives of geology, seismology, climatology, archaeology, biology, genetics, and others. The evolution from ape to man may have also existed in regions other than the Himalayas. However, such evolution falls under "invalid origin" due to the lack of essential conditions for evolution, and particularly, the evolutionary process was interrupted by the erosion of frequent Quaternary glaciations. The homo sapiens originating in the Himalayas gradually migrated and settled down across the world several times during the interglacial periods, creating local cultures and colorful civilizations in parallel. The findings of this paper provide new orientations and approaches for the studies of human origins and the development of civilizations.

Keywords: human origin, the Himalayas, parallel civilization, evidence

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Introduction

Human origins have always been a hot topic of research in academia and are not yet conclusive. Before the 19th century, the most popular view was "God created man." Europeans believed that Adam and Eve were the parents of all living creatures, and in China, there was a fairy tale that "Pan Gu created the heaven and earth and Nv Wa created man." Since the second half of the 19th century, ancient human fossils and Paleolithic tools have been gradually found all over the world. Friedrich Engels contended that man evolved from ape; Charles Robert Darwin proposed human evolutionism, which was generally accepted in academia (Darwin, 1871). However, exactly where ancient ape evolved into modern humans is highly controversial in academia. Regarding this issue, there are two theories, "multiregional evolution" and "single origin."

The theory of "multiregional evolution" argues that human evolution was completed in multiple regions worldwide (e.g. Europe, Africa, and Asia). The rudiments of the theory were proposed by Weidenreich Franz in 1939 and 1943, and the theory was formally proposed by Milford H. Wolpoff et al. in 1984. The theory was supported by famous scholars such as American anthropologists Wolpoff and Jamos Spuhler, biologist Christopher Wills, and Chinese paleoanthropologist Wu Xinzhi. Wu (1998) argued that the origin of Chinese modern man follows the principle of "continuous evolution with hybridization." Sun Fenghua (2002) believed that human evolution did not occur on a specific continent, but in zonal convergence zones between tropical and subtropical zones.

The theory of "single origin" argues that modern humans evolved from ape in a specific region, and then migrated across the world. It is unlikely that man originated in Europe, Oceania, Antarctica, Latin America, or North America; the "single origin" of man mainly refers to Africa or Asia, particularly Africa (Jia, 1974). The theory of single African origin is also known as the invasion theory, substitution theory, and Mitochondrial Eve theory, arguing that the ancestors of all modern humans worldwide originated in Africa. The theory was supported by famous scholars such as American paleontologist William Howells and British paleoanthropologists Christopher Stringer and Allan Wilson. The theory of Asian origin was also supported by many scholars and could date back to the 1930s (Grabau, 1935). Wu Rukang (1964) and Jia Lanpo (1974) argued that man originated in southern Asia. Zhang Xingyong (1981, 1983, 1987, 1994) argued from multiple perspectives that man mainly originates in Asia, and that the central Yunnan Plateau and its adjacent areas may be the critical areas of human origin. Tong Enzheng (1983) pointed out that southwestern China may be the cradle of man. Zhang Minde (1994) believed that the Tibetan Plateau is the hub connecting Asia and Africa with survival conditions suitable for ancient apes, and that it may therefore be the birthplace or origin of man.

The theories of "multiregional evolution" and "single origin" are both based on the fossil records of ancient man, the traces of ancient man, and the results of molecular genetic analysis

(Gao, 2017). The theory of "African origin" is widely supported because of the discovery of the oldest fossils and results of genetic analysis. Due to long-standing erosion and the limitation of assay methods, accurate dating of fossils could not be guaranteed. Slight differences in assay samples can lead to huge differences in assay results, and analysis conclusions may also vary significantly with assay methods (Wu, 1999). Nevertheless, researchers have never extracted any DNA older than 100,000 years from ancient fossils (Gao, 2017). Therefore, there is no conclusive evidence about when and where man originated. However, the evolution from ancient ape to modern man is a complex process, which requires the co-existence of diverse favorable conditions.

Based on a comprehensive analysis of interdisciplinary study results, this paper presents that modern man originated in the Himalayas, and supporting evidence is given from the perspectives of geology, seismology, climatology, archaeology, biology, genetics, and others. Furthermore, combined with global geological and climatic changes in the Quaternary, this paper proposes the routes of human migration from the Himalayas to all over the world, and provides new orientations and approaches for the studies of human origins and the development of civilizations.

Evidence of Human Origins in the Himalayas

The uplifting of the Himalayas and the advent of man were two major events in the Quaternary period. The Himalayas uplifted from the sea bottom into the highest mountains in the world, causing great changes to global climate, ecology, and environments, which provided favorable conditions (e.g., freshwater, minerals, energy, and a favorable climate) for the evolution from ape to man. The world's population distribution and cultural characteristics show that China and India on both sides of the Himalayas are the two most populous countries in the world; the ancient Xiangxiong culture, which dated back to 18,000 years ago, originated in the Tibetan Plateau of the Himalayas; and the four great ancient civilizations were in or near Asia. All of these suggest that the Himalayas may be the origin of human beings. In addition, this view is also supported by the study results of diverse fields including geology, seismology, climatology, archaeology, biology, genetics and so on.

Geological Evidence

The Himalayas was not so high in the past but is gradually uplifted. Before the Eocene epoch, the Himalayas were still located in the Paleo-Tethys Ocean, and gradually uplifted due to the subduction of the Indian tectonic plate under the Eurasian Plate and the Eurasian Plate. According to the comprehensive studies in paleontology (Upadyay et al., 2004), conversions of sedimentary facies and provenances (Cai et al., 2014) and paleomagnetism (Chen et al., 2010), the initial collision between the two plates occurred approximately 55 Ma years ago. Before the collision of the two plates, most parts of the Himalayas were below the sea surface, and emerged from the sea to become land about 40 to 45 Ma years ago (Liu et al., 2017).

There is a divergence of opinion about the uplift speed of the Himalayas. The study of oxygen isotopes of lacustrine carbonates in the Thakkhola Basin, Nepal shows that the altitude of the Himalayas already reached today's level approximately 10 Ma years ago (Garzione et al., 2000a, 2000b; Rowley & Garzione, 2007). Based on the calculation of oxygen isotopes in the Thakkhola and Gyirong Basins, the altitude of the Himalayas reached today's level 7 to 10 Ma years ago (Garzione et al., 2000a, 2000b). However, according to the studies of carbon isotopes of herbivore enamel, the altitude of the Gyirong Basin did not reach today's level 7 Ma years ago and occurred less than 7 Ma years ago (Wang et al., 2006). The Eastern Himalayan Syntaxis began to uplift rapidly 3 Ma years ago at the rate of 1.5 mm/a (Ding et al., 2005).

Undoubtedly, the height of the Himalayas today was not achieved overnight, but gradually uplifted over millions of years. Likewise, the whole Qinghai-Tibet Plateau did not uplift at a uniform speed but uplifted sometimes rapidly and sometimes slowly. The axis of the Himalayas has risen by nearly 3,000 meters since the end of the Tertiary period, and risen by 2,400 meters, 2,000 to 3,000 meters, 1,400 meters, and 300 meters respectively since the early, middle, late Pleistocene, and early and middle Holocene (3,000 to 5,000 years ago) (Zhao, 1975). Li Jijun et al. (1979) summed up the early investigation results of the Qinghai-Tibet Plateau, and comprehensively studied animal and plant fossils, sporopollenin, remains of the paleo-planation surface, and paleokarst, paleosol, and palaeo-glaciers. Accordingly, they argued that the Qinghai-Tibet Plateau has experienced three stages of uplift and two planation processes since the late Eocene epoch and has cumulatively risen by 3,500 to 4,000 meters since the late Pliocene epoch.

The uplift of the Himalayas was not entirely uniform but presented obvious regional variation. Scholars have speculated that the Qinghai-Tibet Plateau underwent an overall uplift in the early middle Pleistocene and rapidly uplifted to the cryosphere above the altitude of 3,500 meters (Zhao et al., 2009). Based on the remains and decrements of climatic snow lines, Zhao Xitao (1975) inferred that since the Qomolangma Ice Age, the Himalayan axis had risen by 1,000 meters, its northern foot by 700 meters, and its northern slope by more than 400 meters. Ge Xiaohong et al. (2014) argued that the Qinghai-Tibet Plateau did not uplift during the Paleogene period (24 to 55 million years ago), but uplifted for the first time in the early and middle Miocene epoch (17 to 23 million years ago), and was planated from the late Pliocene epoch to the early Pleistocene epoch, reaching today's altitude from the late Pliocene epoch to the early Pleistocene epoch (0.8 to 3.6 million years ago). Zhong Dalai and Ding Lin (1996) inferred that the uplift of the Himalayan Plateau was a multi-stage, speed-variable, and non-uniform process and that the overall uplift occurred less than 3 million years ago.

The Himalayas were heightened by the pyramiding of rocks and soils. Due to the gravity effect, the Himalayas could not be heightened infinitely; otherwise, rocks at the bottom would be crushed causing an overall collapse of the Himalayas. It was reported that the altitude of Mount Qomolangma (also known as Mount Everest) exceeded 12,000 meters 13 million years ago. The altitude of the Himalayas already exceeded today's level approximately 9 million years ago (Saylor et al., 2009; Murphy et al., 2009). Due to the tensile deformation under the action of gravity, the altitude of the Zanda Basin has decreased by 1,000 to 1,500 meters since reaching its maximum level during the late Miocene epoch and is continuing to decrease (Murphy et al., 2009).

The above analysis shows that the Himalayas gradually uplifted from below sea level, and its altitude in the Quaternary period was suitable for the survival and evolution of apes. With the increase in altitude, the vegetation in the Himalayas changed from forests to grasslands. To adapt to such an open natural condition, ancient apes surely evolved to walk upright. From a temporal perspective, the late middle Pleistocene is the period in which crustal movement was the most active in the Himalayan region since the Quaternary period. This coincided with the period in which ape evolved into Pithecanthropus and Homo erectus.

Seismological Evidence

Carbon, water, nitrogen, hydrogen, and phosphorus are essential elements for the origin of life, and clay minerals and metal sulfides are important catalysts for the synthesis of organic matter (Shi et al., 2016). Human origins need not only these elements, but also an adequate supply of energy. Under the conditions at that time, earthquakes, volcanoes, thunder and lightning, and the sun were undoubtedly the most direct channels of energy supplies. Studies show that lightning may have given off the indispensable phosphorus for biomolecules that constitute the basis of life, and that lightning may have generated the earliest life on earth. The effect of earthquakes on plant carbohydrates is obvious (Chen et al., 2012). The collision and squeezing between the Indian Plate and Eurasian Plate are bound to produce huge stress, resulting in drastic changes in the geological structure of the Himalayas and triggering earthquakes and volcanic eruptions.

The Mediterranean-Himalayan seismic belt, also known as the Eurasian seismic belt, is one of the three major seismic belts in the world. About 85 percent of active volcanoes and about 80 percent of earthquakes in the world are concentrated in the Pacific region. The Himalayan seismic belt, which is geologically active and earthquake-prone, is the most spectacular subduction tectonic belt with the longest continental lithosphere plate boundary. According to the USGS (United States Geological Survey) Earthquake Catalog, there have been approximately 2,500 magnitude 5.0 earthquakes (including approximately 1,000 medium and deep-focus earthquakes and 1,500 shallow-focus earthquakes) in the past 50 years. Since 1000 AD, there have been 15 earthquakes of magnitude 7.5 or higher, including 10 shallow-focus earthquakes (Bai et al., 2019). In 1850, an earthquake of magnitude 8.6 (the largest earthquake across the recorded history of China) occurred in Motuo, Tibet. In 2015, an earthquake of magnitude 7.9 occurred in Nepal in the middle section of the Himalayan seismic belt. The Qinghai-Tibet Plateau, where the Himalaya mountains are located, is a region with the strongest seismicity with a frequent occurrence of violent earthquakes in China. According to statistics, there have been nine earthquakes of magnitude 8 or higher, and 78 earthquakes of magnitude 7 to 7.9 in the Qinghai-Tibet Plateau seismic belt, ranking first in China.

The continuous earthquakes and volcanic eruptions in the ancient Himalayas provided an energy supply for human evolution and brought about severe damage and impacts to natural environments. To adapt to the living environments, ancient apes needed to develop new styles of life and undergo new variations, thus promoting the evolution from ape to man.

Climatologic Evidence

Climate is an important factor that can promote natural selection and survival of the fittest among creatures and affect the evolution from ape to Homo sapiens. Tong (1983) pointed out that without the abrupt climatic and topographical changes of the Pleistocene, the advent of Homo sapiens would have been unlikely to occur within such a short time. In the Mid-Tertiary, the average temperature of the earth was 23℃ to 24℃, and the world was dominated by warm and humid tropical and subtropical climates (Yang, 1979). This warm and humid climate was surely beneficial to the growth and reproduction of plants and animals, so the Tertiary period is also referred to as the “third derivative period.” At that time, the Himalayan mountains were less than 1,000 meters in altitude, their climatic barrier effect was not obvious, and lush subtropical evergreen broad-leaved forests grew on its north and south slopes, which were ideal places for the survival and inhabitation of Dryopithecus and Ramapithecus (Tong, 1983). Dryopithecus could be found in Asia, Africa, and Europe, and were able to walk upright or on four limbs, staying in the intermediate state between ancient apes and man apes.

However, the global climate began to cool gradually after the Tertiary Period, and a great glacial epoch began in the late Cenozoic (Yang, 1979). In the Quaternary period, there were multiple glacial periods and interglacial periods alternately globally, or specifically, at least four glacial periods and three interglacial periods. China successively underwent the Poyang glaciation, the Dagu glaciation, the Lushan glaciation, and the Dali glaciation (Li, 1947). The Alps in Europe successively underwent five glacial ages including the Donau glaciation, the Gunz glaciation, the Mindel glaciation, the Riss glaciation, and the Wurm glaciation; Mount Qomolangma underwent the Shishapangma glaciation and the Parry interglaciation in the early Pleistocene epoch, and the Nieniexiongla glaciation and the Gabra interglaciation in the middle Pleistocene epoch, and the Qomolangma glaciation in the late Pleistocene epoch (Guo, 1974).

In the heyday of the Quaternary ice age, global temperatures declined sharply, continental ice sheets were formed in high-latitude regions of the Northern Hemisphere, the Greenland ice sheet covered Greenland and Iceland, the Laurentia ice sheet buried the whole of Canada and extended southwards to New York and Cincinnati, nearly half of Europe was covered by the Scandinavian ice sheet, the Siberian ice sheet occupied northern Siberia, and the Nile River in Africa was even cut off (Fairbridge, 1976). Glaciations were disadvantageous to the survival of ancient apes. They either froze to death because of their inability to withstand severe cold or starved to death because of the sharp decline in the number of animals and plants. During the glacial age, only equatorial regions had the temperature suitable for human survival, but most of the equatorial regions were arid and desertified, unsuitable for human survival.

The uplift of the Himalayas and the Qinghai-Tibet Plateau made a great impact on the Asian and even global climate. Studies show that the uplift of the Qinghai-Tibet Plateau played a significant role in the formation of monsoon circulation and the strengthening of westerly fluctuations (Ruddiman et al., 1989a), and its tectonic activity may have been an important compulsive factor for the Cenozoic cooling (Ruddiman et al., 1989b). The three major global cooling events approximately 37 million, 15 million, and 3 million years ago in the Cenozoic era were caused due to the strong uplift of the Qinghai-Tibet Plateau and the western plateau in North America; specifically, the uplift resulted in an enhancement in the invasive, intensified chemical weathering of silicate (the main component of crustal rocks), a decline in carbon dioxide concentration, and a transformation from “greenhouse effect” to “icehouse effect” worldwide (Raymo & Ruddiman, 1992). The uplift of the Qinghai-Tibet Plateau and its feedback effects were among the main reasons for the drastic climatic changes during the Quaternary in China (Yang et al., 1989). The three major cooling events approximately 20 million, 15 million, and 2.4 million years ago in the Cenozoic era coincided with the three strong tectonic movements on the Qinghai-Tibet Plateau, making the Qinghai-Tibet Plateau a driver and amplifier of global climatic change (Pan & Li, 1996).

Before the middle Pleistocene, the barrier effect of the Himalayas on the north-south monsoon was limited, and both the south and north slopes were affected by a similar oceanic climate. After the late Pleistocene epoch, the climatic barrier effect of the Himalayas became obvious (Guo, 1974). On the one hand, the Himalayas and the Qinghai-Tibet Plateau blocked the warm currents of the Indian Ocean from entering the north slope of the Himalayas and northwestern China, resulting in a cold continental climate on its north slope, shrinkage of lakes, disappearance of forests, and formation of alpine steppes and meadows. On the other hand, the Himalayas and the Qinghai-Tibet Plateau blocked northern cold currents from invading the southern regions, and the cold air flowed to north and south China instead; as a result, the temperature of east China was much lower than that of other parts of the world in the same latitudes, and most parts of central, north, south and east China were permafrost regions during the glacial ages. However, regions nearby the south slope of the Himalayas were relatively warm and humid because they are sheltered from the cold air, making them suitable for the survival and evolution of ancient apes.

Biological Evidence

The existence of various creatures is direct evidence of the suitability of survival in a region. The Himalayas has steep slopes, and the vertical gradient varies greatly across a small horizontal length, so the Himalayas are characterized by a great diversity of species. There are 1,410 species in 643 genera from 180 families of seed plants in the Yarlung Zangbo Grand Canyon in the eastern Himalayas (Sun & Zhou, 1996), and there are more than 1,000 species in 309 genera from 72 families of lianas in the Himalayan region (Hu, 2016). At an altitude of 2,300 to 2,500 meters in the Lebu Valley of the eastern Himalayas, non-flying small mammals are diverse in species and present obvious characteristics of a vertical distribution (Wang et al., 2020). In the Himalayas, we can find the archetypes for many creatures in the world, some of which are directly named after the Himalayas, such as Himalayan marmot, Aucuba himalaica, dactylis glomerata subsp. himalayensis, and Himalayan cherry blossom (Zhu et al., 2017). Cherry blossoms originated in the Himalayas and were gradually spread to north India, southwest China and the Yangtze River Basin, Japan, and Korea during the Tang Dynasty.

As confirmed by paleobiological studies, during the Quaternary period the Himalayan region was still rich in vegetation and suitable for the survival of animals in spite of repeated glacial periods. Scholars have found fossils of certain animals (including brachiopods, bryozoans, trilobites, tetracoral, lamellibranch, ammonites, and starfish) and certain plants (including Quercus semicarpifolia and Rhododendron phaeochrysum var. levistratum) in the Shishapangma region (Shi & Liu, 1964). From such fossil beds, scholars have found 262 pollen spores from more than 20 species under Cedrus, Abies, Picea, Pinus, Tsuga, Pinaceae, Betula, Quercus, Labiatae, Cyperaceae, Cuculidae, Pterisisporites, Polypodium, and Selaginella Spring (Xu et al., 1973). From 1966 to 1968, China's Mount Qomolangma scientific expedition team discovered large quantities of branch and leaf fossils of Sabina recurva, Tibetan spruce, Populus, and Lespedeza in the claypan of the middle Pleistocene at an altitude of 5,000 to 5,200 meters; in addition, they discovered branch and leaf fossils of Honeysuckle, Hairy Honeysuckle, Rhododendron, Viburnum dilatatum, Rosa, Spiraea, Rhamnus, and Salix in the Holocene limestones at an altitude of 4,300 meters in Yari on the south slope of Mount Qomolangma (Xu, 1973). Based on the plant fossils and the sporo-pollen found in interglacial and post-glacial deposits on the north slope of the Himalayas, Zhao Xitao (1975) inferred the following: (a) before the middle Pleistocene, across the north slope of the Himalayas, lakes and forests were densely distributed, there were temperate coniferous forests or coniferous broad-leaved mixed forests, and there were even subtropical evergreen broad-leaved forests during the Gabra interglacial period; (b) during the Parry interglaciation, coniferous and broad-leaved mixed forests of pines, oaks, alders, and birches grew on the shores of ancient lakes near Parry; and (c) during the Gabra interglaciation, temperate coniferous forests and coniferous and broad-leaved mixed forests of Tibetan spruces, pines, and oaks grew in the vast areas to the north of the Himalayas, and during the period with the highest temperature, there were also subtropical evergreen broad-leaved forests of magnolia and pecans, as well as the development of red weathered crusts. Based on a comprehensive analysis of the discovered plant fossils and sporopollenin data, Guo Xudong (1974) proposed the order of succession of the plant communities in the Mount Qomolangma area since the Tertiary Pliocene: (a) Quercus spinosa, Quercus pannosa, Quercus senescens Hand.-Mazz, cedar, Abies, and spruce in the late Pliocene epoch of the Tertiary period; (b) alder, oak, birch, and pine during the Parry interglaciation in the early Pleistocene; (c) Tibetan spruce, pine, oak, magnolia, hornbeam, Schima, hickory, Abies, hemlock, and birch during the Gabra interglaciation in the middle Pleistocene; (d) willow, Berberidaceae, hairy honeysuckle, linden viburnum, buckthorn, rhododendron, Spiraea, and rosa in the Yari period of the post-glacial stage.

Chen Wanyong et al. discovered abundant fossils of animals and plants in the Gyirong Basin on the north slope of Shishapangma in the middle section of the Himalayas. Among the hipparion fauna fossils, they discovered the fossils of heat-loving animals of the forest steppe (including Gyirong hipparion, Tibetan Chilotherium, Palaeotragus, Grant's Gazelle, deer, and Crocuta crocuta), as well as Gangetia rissoides (Odhner, 1930). From the sediments of the Dati fossil lake basin of Nieniexiongla, they discovered fossils of aquatic animals (including Unio douglasiae, Adelinella regularis Yü, Radix plicatula, llyocypris gibba, and Limnocythere inopinata) (Chen, 1982). From the sporo-pollens of the Pliocene stratigraphic section, scholars discovered subtropical plants (including teak, Trachycarpus fortunei, Chinaberry, and cedar) (Chen et al., 1977). From the sporo-pollens of the Pliocene Woma formation in the Gyirong Basin, scholars discovered a melange accumulation of Trachycarpus fortunei, PGerzs cretica var. nervosa, Quereussemiear Pifoliagroup, Quercus, cedar, elm, willow, spruce, Abies, hemlock, and potamogeton distinctus (Chen, 1982). In the yellow alluvial sand layer and powder sand layer to the south of Nieniexiongla, scholars found fossils of animals including Ochotona curzoniae, Cricetulus kamensis, and Himalayan marmot (Guo, 1974). In the boulder bed at the foot of Mount Kailash in Ngari, Tibet, scholars discovered abundant fossils of foraminifera including Nummulites, Assilina, Alueolina, and Lockhartia (Yan et al., 2006). In the Zanda Basin, scholars discovered the remains of animals including Tibetan woolly rhinoceros, primitive snow leopards, and early arctic foxes (Deng et al., 2011).

Due to the repeated interglaciations during the Quaternary glacial period, creatures in many other regions disappeared, while the Himalayan-Hengduan region became a new development and differentiation center of alpine floras (Sun, 2002). For example, many phytogroups (including Litsea cubeba and Lindera under Lauraceae) of the Paleo-Teyhys Ocean disappeared in Europe but were retained and further developed in the eastern Himalayas and Hengduan Mountains (Sun & Li, 2003). These studies clearly prove the long-term existence of animals and plants in the Himalayan region, as well as continuous natural selection and evolution with the heightening of mountains and the change of climate. Hence, the Himalayan region, especially the southern Himalayan region, is suitable for the growth of animals and plants and the evolution from ancient ape to man.

Archaeological Evidence

The main research subjects of archaeology are human fossils, as well as materials and cultural relics left behind by man. The archaeology that focuses on the shape, structure, and physical characteristics of ancient human fossils can also be referred to as paleoanthropology or fossil anthropology. Compared with climatic, geological, seismologic, and genetic evidence, archaeological evidence is more direct. Neanderthals, Pithecanthropus erectus, Paranthropus boisei, and "Peking Man" were all discovered and defined according to human fossils. At present, fossils are the main basis for inferring the origins of man. In 1929, the discovery of Peking Man at Zhoukoudian near Beijing established the dominance of the theory of Asian origin. In Africa in the 1960s, people discovered several fossils of Ethiopian Australopithecus afarensis that lived more than 3 million years ago, as well as Ardipithecus ramidus and Australopithecus ramidus that lived more than 4 million years ago. Hence, the theory of African origin received more support.

The Himalayas, which are located on a plateau, have not been inhabited or developed by humans for many years, but archeologists have found fossil evidence of paleo-human activities there. Archaeologists have discovered stone artifacts from the Mesolithic age or a little later (e.g., lithic cores, slices, leaves, and round-head scrapers) in Nyalam county on the south slope of the Himalayas (Dai, 1972), human handprints, footprints, and firepit relics from about 20,000 years ago, 85 km to the northwest of Lhasa, Tibet (David et al., 2002), and 40 stone artifacts from the late Pleistocene on the southeast bank of Siling Co, northern Tibet (Yuan et al., 2007). And along the Brahmaputra River are densely distributed paleolithic, microlithic, and neolithic artifacts used by ancient man (Tang, 2011). In 2018, Gao Xing's expedition team discovered large quantities of stoneware of flint and chalcedony at the Nwya Devu site, Tibet in the hinterland of the Qinghai-Tibet Plateau, confirming that ancient man once lived there 30,000 to 40,000 years ago. All of the above corroborate that ancient man once lived in the Himalayan region.

In addition to material and cultural remains, a large number of fossils of ancient apes and pithecanthropi have been found around the Himalayas. Fossils of ancient apes (including Ramapithecus brevirostris, Harry Ramapithecus, Thorpe Bramapithecus, and Punjab Drypithecus were discovered in the low mountains of Simla in northern India (Edwin, 1935). The fossils of ancient apes discovered in Yunnan included the following: (a) fossils of Kaiyuan dryopithecus of the late Miocene (Woo, 1987); (b) fossils of Ramapithecus (Simons et al., 1965); (c) fossils of Lufeng Ramapithecus of early Pliocene (Wu et al., 1982); (d) fossils of Yuanmou Man of about 1.7 million years ago (Hu, 1973); (e) fossils of late Homo sapiens "Xichou Man" of the late Pleistocene (Chen et al., 1978); (f) fossils of thighbones and skulls of ancient "Lijiang Man" of the late Pleistocene (Yunnan Provincial Museum, 1977); and (g) tooth fossils of ancient man with the characteristics of Late Homo sapiens discovered in Chenggong county (Zhang et al., 1978). Ancient human tooth fossils and chipped stone tools from the late Pleistocene were discovered in Tongzi, Guizhou province (Wu et al., 1975), and in Shuicheng, Guizhou province (1978). A few sites of ancient man from about 10,000 to 2 million years ago were discovered in Chongqing; fossils of "Wushan Man" from about 2 million years ago were found at the Longgupo site; Fossils of archaic Homo sapiens from about 120,000 to 150,000 years ago and their artifacts were discovered at the Fengjie Man site; fossils and stone artifacts of ancient man from the late middle Pleistocene or early Epipleistocene were discovered at the Guandu Man site; one fossil fragment of a humerus of an ancient man from the early Epipleistocene was discovered at the Caotang Man site; two parietal bone fossils from an ancient man from the late Pleistocene were discovered at the Heliang Man site; one humerus fragment was discovered at the Tongliang Man site (Wu et al., 2009); and skull fossils of "Ziyang Man" from the early epipleistocene were discovered in Sichuan province (Wu et al., 2020). These fossils reveal the distribution characteristics that the nearer to the Himalayas, the older the fossil's age, indicating that humans might have migrated from the Himalayas. The rapid uplift of the Himalayas resulted in the gradual decline in plateau temperature, an increasing scarcity of oxygen, and a decrease in food required for survival, so ape-men surely chose to migrate to the surroundings at lower altitudes.

The fossils and living relics of ancient man in the Himalayan and surrounding regions show that the Himalayas may be the cradle of mankind. Based on the diagraph analysis of the distribution of unearthed Ramapithecus and Australopithecus fossils, Jia Lanpo (1974) found the following: (a) The triangle formed by the locations of Ramapithecus fossils lies exactly in the center of the quadrangle formed by the locations of Australopithecus fossils; and (b) South Asia lies in the center of the triangle formed by the locations of Ramapithecus fossils. Hence, southern Asia may be the cradle of mankind (Jia, 1974). The Himalayas are exactly located in this delta-shaped region, corroborating the view that mankind originated in the Himalayas.

Genetic Evidence

Genes are DNA fragments with hereditary effects and reflect the internal domestic relations between the previous generation and the next generation. After the 1980s, some scholars began to apply genetic testing technology to the study of human origins, specifically: (a) to analyze the genetic information of modern populations comparatively and infer the time of human origin according to the differentiation rates; and (b) to sequence and analyze the DNA information extracted from ancient man fossils directly, and decipher the genetic code contained in the DNA information.

A molecular biology team from the University of California, Berkeley was the first to apply genetic technology to the study of human origins and evolution. They comparatively analyzed the cellular mitochondrial (mtDNA) extracted from the placentae of 147 women from Africa, Europe, Asia, New Guinea, and Australia. They found that the mtDNA differences between the African samples were the most significant, thus inferring that Africans have the largest number of inheritances and are thus the oldest races. Hence, they argued that the common ancestor of mankind is a woman who lived in Africa 200,000 years ago, which is referred to as the "Eve Hypotheses" (Cann et al., 1987). This view immediately aroused heated debates in academia. This view was accepted by some scholars, particularly those who held the view of "African origin" but was questioned and refuted by many other scholars (Saitou & Omoto, 1987; Darlu & Tassy, 1987; Templeton, 1991, 1993). The study results of Cann R. et al. were processed using the statistical software PAUP 3.0, but the PAUP 3.0 cannot guarantee to generate optimal tree diagrams when it processes large quantities of data, and calculation results may vary with the input sequence (Templeton, 1991, 1993). In addition, a constant ambiguity rate cannot be used to accurately infer the time of human origin (Templeton, 199, 1993).

The genetic study results of some scholars support the theory of Asian origin, and particularly, man originated nearby the Himalayas. The Douglas Wallace team from Emory University (US) analyzed the mitochondrial DNA in the blood of 700 people from four continents and generated a pedigree chart, finding that the type of mitochondrial DNA of mankind are mostly similar to those of apes living in Asia, and arguing that the earliest "Eve" may have lived in southeastern China (Wu, 1989). Jody Hey (2005), a professor of genetics at New Jersey City University (US), analyzed the DNA samples of American Indians and Northeast Asians and found that there was an obvious hereditability between them, inferring that the ancestors of humans in the American Continent were 70 Asians. Considering the upper bound theorem of genetic diversity, Zhang Ye and Huang Shi (2019) studied the DNA of ancient man and found that the haplogroup R is approximately 5,000 years older than the haplogroup N, arguing that man originated in East Asia. Based on a sequence variation analysis on the mtDNA of 153 independent samples from seven Asian groups, Ballinger S. W. et al. (1992) argued that Southeast Asians may be the ancestors of modern man. The HUGO Pan-Asian SNP Consortium (2009) studied the autosomal variation of Asians and found that the haplotypes of 90 percent of the East Asians are available among Southeast Asian ethnic groups or Central Asian ethnic groups, inferring that Southeast Asian ethnic groups are the main source of the gene pool of East Asians. Based on the analysis of mtDNA and nuclear DNA extracted from the fossils of "Tianyuan Man," Fu Q. et al. (2013) found that the direct ancestors of East Asian ethnic groups and American Indians already lived in Zhoukoudian, Beijing, 40,000 years ago, and were significantly different from the ancient Eurasians of the same period. Based on an analysis of data from 1,000 genomes, Yuan Dejian et al. (2017) found that haplogroup R0 is the most common in southern China, indirectly corroborating that modern man originated in southern China. The genetic studies of surrounding regions of the Himalayas indirectly provide molecular genetic evidence for human origin in the Himalayas.

Human Migration Routes and Parallel Civilizations

Human migration includes active migration and passive migration. Specifically, active migration means that humans yearn for a better life, so they migrate to places with more abundant products and a more suitable climate; passive migration means that humans migrate to change survival conditions because of the changes in geological and seismic environments, increases in altitude, decreased oxygen, and biological degradation. In terms of biological development, passive migration is the main form of human migration, so the Himalayan uplifting is the root cause of human migration. This is the biggest event that has slowly unfolded on the planet, giving an impetus to human evolution.

The African root of human evolutionary theory holds that two large-scale migratory movements originated from Africa. The first migratory movement means that during the early Pleistocene, African Homo erectus migrated northeastward to Asia and Europe, occupying islands along the western Pacific Rim and most of the Old Continent. The second migratory movement means that during the late Pleistocene, Homo sapiens with the characteristics of modern man migrated from middle and low latitudes to high latitudes and from plains to plateaus, passing across Asia and Europe to America and Australia and occupying almost all the land except Antarctica (Hou & Huang, 1998; Wu & Liu, 2001). Mellars P. (2006) argued that Africans entered South Asia and Australia via coastal routes. Ke Yuehai et al. (2001) argued that Africans entered Chinese Mainland from south to north through Southeast Asia after the end of the glacial epoch.

Based on the view of human origins being in southern Asia, Wu Rukang (1964) proposed the theory of a two-stage migration. During the first stage, Ramapithecus migrated to northern Asia to form giantopithecus, and migrated westwards to western and southern Africa through western Asia, to form Australopithecus; during the second stage, they evolved into ape-men and spread to northern Asia (Wu, 1964). Based on the fossils of “Qiangtang Man in western China” from about 2,080,000 years ago, which were discovered at the Kunlun Mountain pass, Ge Xiaohong et al. (2014) proposed the migration process of ancient humans from the Kunlun Mountain pass in the Qinghai-Tibet Plateau: (a) they migrated along the ancient Yangtze River (Jinsha River) to Yunnan, Guizhou, Sichuan, and Chongqing, thus evolving into “Yuanmou Man,” “Ziyang Man” and “Wushan Man”; and (b) they migrated along the ancient Yellow River route to Lantian, Shaanxi province, evolving into “Hetao Man,” “Peking Man,” and “Nihowan Man” along the north branch of the ancient Yellow River route.

For various reasons (e.g., increases in altitude, declines in temperature, scarcity of oxygen, and transitions from forests to grasslands or meadows), ancient humans surely gradually migrated to lower altitudes to satisfy survival needs. Considering that the Quaternary was climatically characterized by frequent glaciations, ancient humans should prefer the southern Himalayas and southwestern China regions as migration destinations and would have frozen or starved to death had they migrated to other destinations. During the Quaternary interglacial periods, the earth was warm and humid and ancient humans began to migrate from the Himalayas along several routes: (a) migrating westwards to Europe and Africa; (b) migrating eastwards to Japan and Korea through the Yangtze River and Yellow River basins, and then reaching the American Continent through the Bering Strait; (c) migrating northwards to the Russia and Arctic; and (d) migrating southwards to South Asia and Australia. Before the arrival of the next glaciations, some then migrated back to the southern Himalayas, and most of those who did not migrate were frozen or starved to death. At the end of a glaciation, ancient humans continued to migrate outwards along these routes. Over time, the evolution of ancient humans gradually deepened (e.g., great improvement in intelligence, acquisition of more survival skills including the use of fire and hunting, and increasing adaptability), so more and more ancient humans survived. It is noteworthy that the evolution from ape to man may also exist in regions other than the Himalayas; for example, Neanderthals, Pithecanthropus erectus, and Paranthropus boisei may be the result of the evolution from local ape to man, but they did not evolve into modern man in the end, falling under invalid origin. These regions may meet some of the essential conditions for the evolution from ape to man, but because they failed to meet all essential conditions, local apes evolved into other species or were frozen or starved to death during the Quaternary glaciations.

After the end of the last glacial period, most of the surviving ancient humans who migrated from the Himalayas settled down locally, developing indigenous cultures and customs, and jointly creating colorful world civilizations. Humans originated in the Himalayas, and civilizations developed in parallel in different regions. Due to regional differences in climate and sunshine, the skin colors of modern man have changed remarkably after generations of natural selection and genetic variation. Humans who migrated to northern regions gradually became white men as they evolved white skin under weak sunshine. By contrast, humans who migrated to Africa gradually became black men as they evolved black skin under strong sunshine. This view is also supported by the findings of Brown W. M. (1980). His study of human mitochondria shows that black, white, and yellow men share similar genes, indicating that races of different skin colors share common ancestors.

Based on a comprehensive analysis of existing research findings, this paper argues that modern man originated in the Himalayas, and presents supporting evidence from multiple perspectives. This study provides new orientations and approaches for the studies of human origins. The Himalayan uplift from the sea bottom is also a process of human evolution. The Himalayas are the common cradle and hometown of mankind. Not only animals and plants but also human cultures and beliefs originated in the Himalayas. The Himalayan movement is a condition of human evolution, and the Himalayan uplift resulted in the spread and migration of man in all directions. Yet, few ancient human fossils have been found around the Himalayas due to the limitations of the natural environment and insufficient archaeological activities. As the Himalayas are investigated in greater depth from the perspectives of multiple disciplines (including archaeology, geology, climatology, and genetics), this conclusion will be further confirmed.

REFERENCES

Bai, L., Song, B., Li, G., Jiang, Y., & Dhakal, S. (2019). Seismic activity in the Himalayan orogenic belt and its related geohazards. *Advances in Earth Science*, 34(6): 629-639.

Ballinger, S. W., Theodore, G. Schurr, Antonio, T. et. al., (1989). Southeast Asian mitochondrial DNA Analysis reveals genetic continuity of ancient mongoloid migrations. *The Genetics Society of America*, 44: 182-190.

Brown, W. M. (1980). Polymorphism in mitochondrial DNA of humans as revealed by restriction endonuclease analysis. *Proceedings of the National Academy of Sciences of the United States of America*, 77(6): 3605-3609.

Cai, F., Ding, L., & Yue, Y. (2011). Provenance analysis of upper Cretaceous strata in the Tethys Himalaya, southern Tibet: Implications for timing of India-Asia collision. *Earth and Planetary Science Letters*, 305: 195-206.

Cann, R., Stoneking, M., & Wilson, A. C. (1987). Mitochondria DNA and human evolution. *Nature*, 325: 31-36.

Cao, Z. (1978). Paleolithic site in the Xiaohui Cave of Shuicheng County, Guizhou. Vertebrata Palasiatica, (01): 6772+9293.

Charles, D. (1982). *The Descent of Man and Selection in Relation to Sex*, Science Press, Beijing, pp. 1016.

Chen, B., Li, Z., He, Q., Li, J., Su, Y., & Liu, Y. (2012). Studies of non-structural carbohydrates of Cupressus funebris in different landslides after Wenchuan Earthquake. *Acta Ecologica Sinica*, 32(3): 999-1006.

Chen, D., & Qi, G. (1978). *Vertebrata Palasiatica*.

Chen, J., Huang, B., & Sun, L. (2010). New constraints to the onset of the India-Asia collision: Paleomagnetic reconnaissance on the Linzizong group in the Lhasa Block, China. *Tectonophysics*, 489: 415-476.

Chen, W. (1982). Pliocene environment of hipparion fauna of middle Himalaya range. *Vertebrata Palasiatica*, 20(1). 45-53+94.

Chen, W., Fan, G., & Yu, Q. (1977). *Vertebrata Palasiatica*, 15(4). 261-270+327-329.

Dai, E. (1972). Stone vessels discovered in Nyalam County, Tibet. *Archaeology*, (1): 4344+47.

Darlu, P., & Tassy, P. (1987). Disputed African origin of human populations. Nature, 329: 111-112.

David, D., Zhang & Li S. H. (2002). Optical dating of Tibetan human hand and footprints: An implication for the palaeoenvironment of the last glaciation of the Tibetan Plateau. *Geophysical Research Letters*, 29(5): 16-1—16-3.

Deng, T., Wang, X., Fortelius, M., Li, Q., Wang, Y., Tseng, Z. J., Takeuchi, G. T., Saylor, J. E., Saila, L. K., & Xie, G. (2011). Out of Tibet: Pliocene woolly rhino suggests High-Plateau origin of Ice Age megaherbivores. *Science*, 333: 1285–1288.

Ding, L., Zhong, D., & Pan, Y. et al. (1995). Fission track evidence for rapid uplift of the eastern Himalayan syntaxis since the Pliocene. *Chinese Science Bulletin*, 40 (16): 1497-1500.

Edwin, H. Colbert. (1935). Siwalik Mammals in the American Museum of Natural History. *Transactions of the American Philosophical Society*, (26).

Fairbridge, R. W. (1976). Effects of Holocene climatic change on some tropical geomorphic processes, *Quaternary Research*, 6: 529-556.

Fu, Q., Mateja H., Oana Teodora Moldovan, et al., (2015). An early modern human from Romania with a recent Neanderthal ancestor.

Nature, 524: 216–217.

Gao, X. (2017). Collaboration and integration among paleoanthropology, archaeology and genetics. *Acta Anthropologica Sinica*, 36(1): 131-140.

Garzione, C. N., Dettman, D. L., Quade, J., De Cells P. G., & Butler, R. F. (2000a). High times on the Tibetan Plateau: Paleoelevation of the Thakkahola graben, Nepal. *Geology*, 28(4): 339-342.

Garzione, C. N., Quade, J., Decelles, P. G., & English, N. B. (2000b). Predicting paleoelevation of Tibet and the Himalaya from δ18O vs. altitude gradients in meteoric water across the Nepal Himalaya. *Earth and Planetary Science Letters*, 183: 215-229.

Ge, X., Liu, J., Ren, S., & Yuan, S. (2014). Tectonic uplift of the Tibetan Plateau: Impacts on the formation of landforms, climate changes and ancient human migration in China. *Geology in China*, 41(3): 698-714.

Grabau, A. W. (1935). Tibet and the Origin of Man. Geografiska Annaler, (17): 317-325. Retrieved from https://www.jstor.org/stable/519867.

Guo, X. (1974). Climatic changes in the mount Jolmo Lungma region southern Tibet, China,during the quaternary period. *Scientia Geologica Sinica*, (1): 59-80.

Hou, Y., & Huang, W. (1998). East Asia and the first migration tide of early man, *Acta Anthropologica Sinica*, (4).

Hu, C. (1973). Ape-man teeth from Yuanmou, Yunnan. *Acta Geologica Sinica*, (1): 65-71.

Hu, L. (2016). Diversity and distribution patterns of climbing plants in the Himalayan region. *Biodiversity Science*, 24(10): 1105-1116.

Jia, L. (1974). Some questions about the origin of mankind. *Vertebrata Palaslatica*. 12(3): 165-173.

Jody, H. (2005). On the number of new world founders: A population genetic portrait of the peopling of the Americas. *Plos Biology*, 3(6): 965-975.

Ke, Y., Su, B., & Li, H. et al. (2001). The origin of Chinese from Africa supported by the genetic evidence of Y Chromosome. *Chinese Science Bulletin*, 46 (5): 411414.

Li, J., Wen, S., Zhang, Q., Wang, F., Zheng, B., & Li, B. (1979). Discussion of the age, amplitude and form of uplift of the Qinghai-Tibet plateau. *Science China*, 608616.

Li, S. (1947). Mount Lushan in the Ice Age. Special Journal of Institute of Geology, Academia Sinica, 2 of Category B.

Liu, X., Xu, Q., & Ding, L. (2017). Differential surface uplift: Cenozoic paleoelevation history of the Tibetan Plateau. *Science China Earth Sciences*, 59: 2105–2120, doi: 10.1007/s11430-015-5486-y.

Mellars, P. (2006). Going east: New genetic and archaeological perspectives on the modern human colonization of Eurasia. *Science*, 313: 796-800.

Murphy, M. A., Saylor, J. E., & Ding, L. (2009). Late Miocene topographic inversion in southwest Tibet based on integrated paleoelevation reconstructions and structural history. *Earth and Planetary Science Letters*, 290: 173-182.

Pan, B., & Li, J. (1996). Qinghai-Tibetan plateau: a driver and amplifier of the global climatic change Ⅲ. The effects of the uplift of Qinghai-Tibetan plateau on climatic changes. *Journal of Lanzhou University(Natural Science)*, 32(1): 108-115.

Raymo, M., & Ruddiman, W. F. (1992). Tectonic forcing of late cenozoic climate. *Nature*, 359: 117-122.

Rowley, D. B., & Garzione, C. N. (2007). Stable isotope-based paleoaltimetry. *Annual Review of Earth and Planetary Sciences*, (35).

Ruddiman, W. F., & Kutzboch, J. E. (1989a). Forcing of late Cenozoic northern hemisphere climate by plateau uplift in Southern Asia and the American West. *Journal of Geophysical Research: Earth Surface*,(94): 18409-18427.

Ruddiman, W. F., Prell, W. L., & Raymo, M. E. (1989b). Late Cenozoic uplift in Southern Asia and American West: rationale for general circulation modeling experiment. *Journal of Geophysical Research: Earth Surface*, (94): 18379-18391.

Saitou, N., & Omoto, K. (1987). Time and place of human origins from mtDNA data. *Nature*, 327: 288.

Saylor J. E., Quade, J., Dettman, D. L., DeCellles, P. G., Kapp, P. A., & Ding, L. (2009). The late Miocene through present paleoelevation history of southwestern Tibet. *American Journal of Science*, 309: 1-42.

Shi, X., Li, Y., Cao, C., Tang, D., & Shi, Q. (2016). Life origin, early evolution stages, and ocean environment changes. *Earth Science Frontiers*, 23(6): 128—139.

Shi, Y., Liu, D. (1964). Preliminary report on scientific expedition in Shishapangma. *Chinese Science Bulletin*, (9): 928938.

Simons, E. L., & Pilbeam, D.R. (1965). Preliminary revision of the Dryopithecinae (Pongidae, Anthropoidea). *Primatologia,* 3(2-3): 81-152.

Sun Hang & Li Zhimin. (2003). Qinghai-Tibet plateau uplift and its impact on Tethys flora. *Advance in Earth Sciences*, 18(6): 852-862.

Sun, F. (2002). Historical and geographical study on the origin of human kind. *Journal of Shanxi Teacher's University Natural Science Edition*. 16(2): 86-91.

Sun, H., & Zhou, Z. (1996). The characters and origin of the flavor from the big bend gorge of Yalutsangpu (Brahmabutra) river, eastern Himalayas. *Acta Botanica Yunnanica*, 18(2): 185-204.

Sun, Hang. (2020). Evolution of Arctic-Tertiary Flora in Himalayan-Hengduan Mountains. *Acta Botanica Ynunanica*, 24(6): 671-688.
Tang, H. (2011). The archaeological cultures and their economic types on the Qinghai-Tibetan plateau in the late paleolithic age to the early neolothic age. *Acta Archaeologica Sinaca*, 52(13):1567-1571.
Templeton A. R. (1993). The 'Eve' hypotheses: a genetic critique and reanalysis. *American Anthropologist*, 95: 51-177.
Templeton, A. R. (1991). Human origins and analysis of mitochondrial DNA sequences. *Science*, 255: 737.
The Altitude of Qomolangma once Exceeded 12,000 Meters. Chinese Academy of Sciences. Retrieved from http://www.cas.cn/zt/jzt/kyzt/zfdqzhkk/zxdt/200504/t20050412 2664671.shtm.
The HUGO Pan-Asian SNP Consortium. (2009). Mapping Human Genetic Diversity in Asia. *Science*, 326: 1541-1545.
Tong, E. (1983). Possible origin of man—Southwestern China. *Journal of Sichuan University (Social Science Edition)*, (3): 314.
Upadyay, R., Ram-Awater, R., Kar, R. K., & Sinha, A. K. (2004). Palynological evidence for the Palaeocene evolution of the forearc basin, Industry Suture Zone, Ladakh, India. Terra Nova, 16: 89-100.
Wang, Y., Deng, T., & Biasatti, D. (2006). Ancient diets indicate significant uplift of southern Tibet after ca. 7 million. *Geology*, 34(4): 309-312.
Wang, Z., Hu, Y., Zhou, Z., Liang, J., Huang, Z., Zheng, S., Zhou, J., & Hu, H. (2020). Verification of the vertical distribution pattern of species diversity of non-flying small mammal in the Lebu Valley of Eastern Himalayas, China. *Acta Theriologica Sinica*, 40(5): 493-502.
Weidenreich, F. (1939). Six lectures on Sinanthropus pekinensis and related problems. *The Geological Society of China*, 19: 1-110
Weidenreich, F. (1943). The skull of Sinanthropus pekinensis, a comparative study on a primitive homind skull. *Palaeontologia Sin (Series D)*, 10: 1-485
Wolpoff. M. H., Wu, X., & Thorne, A. (1984). Modern Homo sapiens origins: A general theory of hominid evolution involving the fossil evidence from East Asia. In: Smith F H, Spencer F, eds. The Origins of Modern Humans. New York: Alan R Liss Inc., 411-483.
Woo Ju-kang. (1987). Dryopithecus teeth from Keiyuan, Yunnan Province. *Vertebrata Palasiatica*, 2(1): 25-32.
Wu, M., Wang, L., & Zhang, Y. (1975). Fossils and cultural relics of ancient man discovered in Tongzi County, Guizhou. *Vertebrata Palasiatica*, (01): 1423+7173.
Wu, R. (1964). Present situation and prospect of theoretical research on human origin. *Vertebrata Palaslatica*. 8(4): 362-373.
Wu, R. (1989). New argument of the origin of modern man. *Acta Anthropologica Sinica*, 8(2): 182-185.
Wu, R., Han, D., Xu, Q., Qi, G., Lu, Q., Pan, Y., & Chen, W. (1982). More ramapithecus skulls found from Lufeng, Yunnan—Report on the excavation of the site in 1981. *Acta Anthropologica Sinica*, 1(2): 101-105.
Wu, W., & Liu, D. (2001). Climate shifts during Pleistocene and its implications for early human dispersal. *Marine Geology & Quaternary Geology*, 21(4): 103-109.
Wu, X. (1998). Chinese human paleontological study in 20th century and prospects. *Acta Anthropologica Sinica*, (3).
Wu, X. (1998). Origin of modern humans of China viewed from cranio-dental dental characteristic of late homo sapiens China. *Acta anthropologica sinica*. 17(4): 276-282.
Wu, X. Pei, S., Zou, H., Hou, J., & Wang, Y. (2009). Discovery and study of human fossils in the Three-Gorges region, China. *Archaeology*, (03): 4956+113.
Wu, X., & Yan, Y. (2020). Endocranial anatomy of the Ziyang 1 human skull. *Acta Anthropologica sinica*, (4):511-520.
Xu, R., Tao, J., & Sun, X. (1973). On the discovery of a quercus semicarpifolia bed in mount Shisha Pangma and its significance in botany and geology. *Acta Botanica Sinica*, 15(1): 103-119.
Yan, Z., Fang, A., Pan, Y., Li, J., Liu, X., & Yu, L. (2006). Detrital modal, geochemical characteristics and tectonic setting of the Dajin marine clastic rocks, Tibet. *Acta Petrologica Sinica*, 22(4): 949-960.
Yang, H. (1979). Climate change in the Quaternary. *Journal of Glaciology and Geocryology,*, (01): 25-34.
Yang, H., Xu, X., & Li, G. (1989). The causal mechanism of quaternary environmental changes in China. *Quaternary Sciences*, (2): 97-111.
Yuan, B., Huang, W., & Zhang, D. (2007). New evidence for human occupation of the northern Tibetan Plateau, China during the Late Pleistocene. *Chinese Science Bulletin*, 52 (13): 15671571.
Yuan, D., Lei, X., Gui, Y. et al., (2017). Modern human origins: multiregional evolution of autosomes and East Asia origin of Y and mtDNA. doi: https://doi.org/10.1101/101410.
Yunnan Provincial Museum. (1977). Preliminary Study of Human Skull Discovered in Lijiang, Yunnan. *Vertebrata Palasiatica*, 15 (2): 157-160.
Zhang, M. (1994). Tibet Plateau is the cradle or origin of man—about the prehistoric archaeology of Tibet. *Tibetan Art Studies*, (3): 51-55.
Zhang, X. (1987). The fourth discussion of the central Yunnan Plateau and origin of man, *Social Sciences in Yunnan*, (03): 76-82.

Zhang, X., & Zheng, L. (1981). Central Yunnan plateau and anthropogeny. *Social Sciences in Yunnan*. (3): 43-50.

Zhang, X., Ha, B., Wang, S. et al. (2018). The earliest human occupation of the high-altitude Tibetan Plateau 40 thousand to 30 thousand years ago. *Science*,362(6418): 1049-1051.

Zhang, X., Hu, S., & Zheng, L. (1978). Human tooth fossils of the Late Pleistocene Epoch discovered in Kunming, Yunnan. *Vertebrata Palasiatica*, (4): 288289+308.

Zhang, X., Zheng, L., & Xiao, M. (1983). Further discussion of the central Yunnan plateau and origin of man based on the morphological characteristics of ramapithecus in Kaiyuan, *Social Sciences in Yunnan*, (01): 83-88.

Zhang, X., Jiang, C., & Lin, Y. (1987). The third discussion of the central Yunnan Plateau and origin of man based on the oriental ape-man in Yuanmou and Hudie Ramapithecus, *Social Sciences in Yunnan*, (03): 4850+80.

Zhang, Y., & Huang, S. (2019). The out of east Asia theory of modern human origins supported by recent mtDNA findings. *Acta Anthropologica Sinica*, 38(4): 491-498.

Zhao, X. (1975). On the recent uplift of the Himalayas. *Scientia Geologica Sinica*, (3): 243-250.

Zhao, Y, Qian, F., Zhu, D., Zhang, Y., Shao, Z., & He, Z. (2009). Early records of Quaternary glaciation in Qinghai-Tibet plateau and their tectonic and climatic implications. *Geology in China*, 36(6): 1195-1207.

Zhong D. L., & Ding L. (1996). Rising process of the Qinghai-Xizang (Tibet) plateau and its mechanism. *Science in China: Series D*, 39(4): 369-379.

Zhu, J., Li, X., Tian Yuan, Li Shuigen, Guan Yuan, Fan Xiaofen & Yin Liqing. (2017). Introduction and ecological adaptability of Himalayan cherry, *Acta Agriculture Shanghai*, 33(5): 64-67.

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