From Earth to Heaven: An Architectural Spectacle of The Dunhuang Mogao Caves

Zhenru Zhou

Intro: Cave-front architecture

A Buddhist cave-temple is more than a rock-cut cave-chamber; the entrances of the decorated caves are often screened by porches, halls, and pavilions, known together as "the cave-front architecture" (*kuqian jianzhu* 窟前建築).[1] Some of the oldest and most complete timber-structured porches are preserved at the Mogao Caves 莫高窟 of Dunhuang (Gansu, China), a major cave site in the Gobi Desert of Northwest China. At the mile-long cave complex, four modest-sized porches of Mogao Caves 427, 431 (Figure 1), 437, and 444, and timber members of Caves 196 and 428 are rare examples of Chinese timber-structured architecture from the first millennium.[2] While thrilled to recognize their historical value, pioneering scholar Liang Sicheng (1901–1972) pitifully comments that "they hardly deserve the name of real buildings, for they are merely porches screening the entrances of the caves."[3] The prototypical "real buildings" for Liang and many others are the timber-structured, freestanding halls of monumental size, and therefore the Mogao porches seem inferior for their smallness and structural incompleteness.

Nonetheless, one should not ignore their site-altering effect and religious importance. It is because of the cave-front architecture of expansive scales and various types—now largely non-extant—that the medieval pilgrims often viewed the Mogao complex as an architectural spectacle.[4] As a Tang-period (618–907) stele records, "the levels [of caves] above and below appear as soaring clouds, wherein flying pavilions were built. To the north and south are linked [caves] in a long stretch …Reflected on the river are [the images of] multilevel pavilions."[5] Without seeing "the multilevel pavilions" that connected the levels of caves and the porches "linked in a long stretch," how can we the modern viewers understand the cave-temples in their totality? What did the Mogao Caves look like at the prime of cave-front architecture construction? And what is the implication of the "unreal" cave-front architecture for this spectacle?

Archaeological and textual evidence of cave-front architecture has been gradually discovered since the mid-twentieth century.[6] Current scholarship mainly focuses on either the technological and stylistic features of the timber structures or the layout of the cave complex. One approach

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1 For a recent review of the studies of cave-front architecture in China, see Peng Minghao, "Zhongguo shikusi kuqian jianzhu de faxian yu yanjiu" (Discoveries and Studies of Cave-Front Architecture of Chinese Caves), *Zhongguo wenhua yichan*, 5 (2018): 4–13.

2 Nancy Shatzman Steinhardt, *Chinese Architecture: A History* (Princeton: Princeton University Press, 2019), 132.

3 Liang Sicheng (Liang Ssu-ch'eng), *A Pictorial History of Chinese Architecture: A Study of the Development of Its Structural System and the Evolution of Its Types* (Cambridge, Mass.: MIT Press, 1984), 44. Nonetheless, Liang carefully investigates the dating of the porches in "boxihe xiansheng guanyu Dunhuang jianzhu de yifeng xin" (A letter from Professor Paul Pelliot to Liang Ssu-ch'eng), *Zhongguo yingzao xueshe huikan* 3, no. 4 (1932): 123–129. Nineteen years later, he further discussed the structural features and painting decoration of the porches in "Dunhuang bihua zhong suojian de Zhongguo gudai jianzhu" (Chinese traditional architecture seen in the Dunhuang wall paintings), *Wenwu cankao ziliao* 12, no.5 (1951): 1–48.

4 For more literary descriptions of the appearance of the Mogao Caves from the seventh to the tenth centuries, see Ma De, *Dunhuang shiku yingzao shi daolun* (A Guide to the construction History of the Dunhuang Caves) (Taipei: Xinwenfeng chuban gufen youxian gongsi, 2003), 97–99; and Sha Wutian, *Guiyijun shiqi Dunhuang shiku kaogu yanjiu Dunhuang shiku kaogu yanjiu* (An Archaeological Study of Dunhuang during the Guiyijun Period) (Lanzhou: Gansu jiaoyu chuban she, 2017), 4–7.

5 上下雲矗, 構以 閣，南北遐連……波映重閣. Excerpt from "Li Kerang xiu Mogaoku fokan bei 李君莫高窟佛龕碑" (Stele of a Buddhist Cave at Mogao by the Gentleman Surnamed Li, P.3608, 698 CE). Translation after Wei-Cheng Lin, "What Did 'Architecture Do in Visualizing Dunhuang?" in *Visualizing Dunhuang: The Lo Archive Photos of the Mogao and Yulin Caves*, ed. Dora C.Y. Ching, vol. 9 (Princeton: Princeton University Press, 2021), 191.

6 For major outcomes of the archaeological excavations of the Mogao Caves conducted by Dunhuang Academy, see Pan Yushan and Ma Shichang, *Mogaoku kuqian diantang yizhi* (Ruins of Frontal Buildings Added to Mogao Grottoes) (Beijing: Wenwu chuban she, 1985); Sha Wutian, "Dunhuang Mogao ku di 72–76 ku kuqian diantang yizhi qingli fajue baogao" (Report of the Archaeological Excavation of the Front-Hall Remains of Dunhuang Mogao Cave 72–76), *Kaogu xuebao* 147, no.4 (2002): 493–513; and Peng Jinzhang, Wang Jianjun, and Guo Junye, "Dunhuang mogao ku jiucenglou laogu xin faxian" (New Archaeological Discoveries of the "Nine-Story Pavilion" of Dunhuang Mogao Caves), in *2000 nian Dunhuang xue guoji xueshu taolun hui lunwen tiyao ji* (Collections of the Paper Abstracts of the International Conference on Dunhuang Studies in 2000), ed. Dunhuang Academy (Dunhuang: Dunhuang Academy, 2000), 68–69. For a recent review of the discoveries, see Sha, *Guiyijun shiqi*, 7–14. For discoveries of Dunhuang manuscripts about cave distribution and timber-façade construction, see Wu Mangong, "Dunhuang shiku laba randeng fenpei kukan mingshu" (List of Caves for Distributing Lanterns during the Light Up on the Eighth Day of the Twelve Month), *Wenwu* 105, no. 5 (1959): 49; and Ma De, "Jiuzhou daxue wenxue bu cang Dunhuang wenshu 'xin dade zao kuyan jiliao' tanwei" (A Preliminary Study of Records about Building Materials Used by the New Bhadanta in Rebuilding the Eaves of a Cave of Dunhuang Manuscript Kept in the Literary Department of Kyūshū University), *Dunhuang yanjiu* 36, no.3 (1993): 59–63.

investigates the timber-structured construction system through the extant porches and theoretical reconstruction of a few more.[7] The other approach surveys the overall distribution of caves on the cliff face and the historical developments.[8] These studies elucidate the historical appearance of Mogao Caves at the micro and macro scales, but a vast middle ground is understudied.[9] Therefore, this paper investigates the typological spectrum of the cave-front architecture and the interplay between the structures in the evolving cave landscape. The first section gives an overview of the roles of cave-front architecture in shaping the space, architecture, and general appearance of the Mogao Caves. The second section, following the chronological order of their advents, analyzes the porch, the colossal image pavilion, and the ante-hall. As the paper will demonstrate, the horizontal and vertical dimensions of the architectural landscape were largely explored in the Sui period (581–618) and the first half of the Tang period (618–907); rows of porched caves were linked in a long stretch and the advent of two colossal image caves (*daxiang ku* 大像窟) introduced verticality and monumentality to the complex.[10] In the following Guiyijun period (851–1036), the height, depth, and variety of this landscape were significantly upgraded through the reconstruction of the multilevel pavilions screening the colossal image caves and the prevalence of porticoed ante-halls. By investigating the cave-front architecture in spatial contexts and its historical perceptions, the study reveals a collective attempt in the long durée to transform the imagery of the Mogao Caves from a mountain monastery into heavenly palaces.

Space and Architecture

Recognizing the cave-front architecture is a crucial step of seeing a cave-temple in integrity. A cave-temple in Dunhuang from the seventh century onwards typically consists of four architecturally defined spaces along the transversal axis. The spaces are respectively, from outermost to innermost, (1) an antechamber that provide room for a transition from outdoor to indoor, (2) a corridor that functions as the threshold to the main chamber, (3) a main chamber where beholders may perform image-involved activities, and finally, (4) a spatial device that enshrines Buddhist images, such as a niche, a niched pillar, or an altar (Figure 2). If the cave is located above the ground level, an overhanging passageway would be built in front of the timber-structured porch to link caves on the same level. As the frontmost part of a cave-temple, the cave-front architecture serves to prevent sand and wind from damaging the interiors, facilitate circulation between caves, and provide more room for religious activities such as copying Buddhist scriptures.[11] Moreover, as architectural historian Xiao Mo aptly points out, the antechamber serves two main aesthetic functions. For one thing, it allows a beholder to "mentally transit" from "the world of humans" to "the world of deities." For another, the architectural orderliness of the antechamber eliminates the grotesque quality of a cave opening and provides a visual pleasure.[12] In other words, the cave-front architecture is a device for spatial and aesthetical enhancement. The varied cave types and historical circumstances result in a wide range of cave-front architecture. They range from exposed and porched antechambers, to porticoed ante-halls and multileveled pavilions that screen the caves.

The notion of space was introduced to cave-front architecture prior to that of "architecture," which in the Chinese context often means timber-structured buildings and the imitation of it by masonry or metal buildings.[13] The earliest decorated caves of the Mogao complex were directly

7 For studies of the extant porches, see Chen Mingda et al, "Dunhuang shiku kancha baogao" (Survey Report about the Dunhuang Caves), *wenwu cankao ziliao* 54, no.2 (1955): 39–70; Gu Qiyi, "Dunhuang shiku songchu kuyan ji beiwei dong neidougong shulue" (Brief discussion of the Early-Song cave-eaves and the Northern-Wei bracket-sets inside the caves at the Dunhuang Caves), *Tumu jianzhu yu huanjing gongcheng* 1 (1957): 51–75; Yu Mingqian, "Mogao ku di 196 kuyan yanjiu" (A study of the timber-structured facade of Mogao Cave 196), in *Keji shi wenji 7: Jianzhu shi zhuanji* (Essay Collections about the History of Science 7: Volume on Architectural History), ed. Editing Committee of the Volume on Architectural History (Shanghai: shagnhai kexue jishu chuban she, 1981), 92–97; and Xiao Mo, *Dunhuang jianzhu yanjiu* (Architectural Research of Dunhuang Grottoes) (Beijing: Wenwu chubanshe, 1989), 269–302. For theoretical reconstruction based on archaeological discoveries of ante-halls, see Xiao Mo, "Dunhuang Mogaoku di 53 ku kuqian Song dai jianzhu fuyuan" (Theoretical Reconstruction of a Song-period Building in front of Mogao Cave 53 of Dunhuang), *Kaogu,* 6 (1977): 412–421; republished in *Dunhuang jianzhu yanjiu*, 313–324; Wu Xiao, "Mogao ku 55 ku kuqian jianzhu fuyuan yanjiu" (Reconstructional Study of the Frontal Architecture of Mogao Cave 55), *Jianzhu shi* 42, no.2 (2018): 29–46. For reconstruction based on a cave-eave construction memo, see Feng Jiren, "Riben Jiuzhou daxue cang Dunhuang wenshu suoji kuyan de fenxi yu fuyuan" (A Reconstruction and Analysis of the Grotto Wood Eaves Recorded in the Dunhuang Document Collected at Kyūshū University, Japan), *Wenwu*, 12 (1993): 54–68.

8 For discussions of general cave distribution based on a mid-tenth century lantern distribution record, see Jin Weinuo, "Dunhuang kukan mingshu kao" (Study of the List of Caves of Dunhuang), *Wenwu*, 5 (1959): 50–54; and Ma De, "10 shiji zhongqi de mogaoku yamian gaiguan—guanyu 'laba randeng fenpei kukan mingshu de jige wenti" (The Overview of the Mogao Cliff Surface in the Mid-Tenth Century—Several Question about the Manuscript Titled 'List of Caves for Distributing Lanterns during the Light Up on the Eighth Day of the Twelve Month'), in *1987 nian dunhuang shiku yanjiu guoji taolunhui wen ji : shiku kaogu bian* (Proceedings of the International Conference on Dunhuang Cave Studies in 1987), ed. Dunhuang Academy (Shenyang: Liaoning meishu chubanshe, 1990), 40–52. For discussions of the general appearance based on archaeological materials, see Ma De, *Dunhuang shiku yingzao shi daolun* (A Guide to the construction History of the Dunhuang Caves) (Taipei: Xinwenfeng chuban gufen youxian gongsi, 2003), 118–150; and Pan Yushan, "Mogao ku waimao bianqian de jige wenti" (Several Problems about the Changes of the Appearance of the Mogao Caves), in *1987 nian dunhuang shiku yanjiu guoji taolunhui wen ji*, 53–66.

9 Two exceptions are Sha Wutian, "guanyu dunhuang mogaoku kuqian diantang yu kuyan jianzhu de shidai wenti" (On the Date of the Hall in Front of Cave and Cave' Eaves in Mongao Grottoes), *Kaogu yu wenwu*, 1 (2003): 56–61; and Sun Yihua, "Mogaoku nanqu kuyan jianzhu yiji diaocha yanjiu" (A Survey of the Traces of Façade Architecture in the Southern Section of the Mogao Grottoes), *Dunhuang yanjiu* 178, no.6 (2019): 17–23. Both studies are conducted in the quantitative method based on massive data about archaeological materials. A further step of explaining the visual quality and historical reception is not yet explored.

10 For formal features of the colossal image cave, see Xiao, *Dunhuang jianzhu yanjiu*, 51–54.

11 Chen et al, "kancha baogao," 61–62; and Sha, *Guiyijun shiqi*, 22.

12 Xiao, *Dunhuang jianzhu yanjiu,* 35.

13 Liang, *A Pictorial History*, 1–13; and Steinhardt, *Chinese Architecture,* 1–7.

cut into the west-facing cliff, revealing only the entrance corridor, occasionally accompanied by a rock-cut window above. It is not until the second quarter of the sixth century that the larger caves began to acquire a rock-cut, exposed antechamber, known in medieval Dunhuang manuscripts as "*kuchang* 窟敞 (廠)" (lit. cave-opening).[14] The appearance of the antechamber-less caves and those with rock-cut, exposed antechambers are preserved at the northern section of the Mogao Caves (Figure 3), which consists of about two hundred undecorated, pragmatic caves.[15] Traces of timber-structured balconies and roofs are found at only a few image caves.

In contrast, the southern section, comprising some five hundred image caves from the fifth to fourteenth centuries, exhibits prevalent traces of timber structures. They gave early surveyors the impression that "every cave seems to have once had a timber-structured porch."[16] Thirty-three extant facades, including the six aforementioned medieval porches, are spread along the entire southern section and the total height of the cliff.[17] According to a quantitative study recently conducted by Sun Yihua, an architectural specialist of the Dunhuang Academy, 345 out of the 487 caves of the southern section used to be covered by 271 timber-structured porches.[18] This means over 70 percent of the image caves had an architectural outlook. The drastic contrast between the North and the South Sections testifies to the close connection between the architectural appearance and the ritual function of a cave-temple. To better understand how the architectural spectacle of Mogao took shape, the rest of this paper analyzes three basic types that compose it—porch, colossal image pavilion, and ante-hall—in two peak periods of cave construction.

Overhanging Porches in the Sui-Tang period

The first peak period of construction occurred in the Sui and the first half of the Tang period before Dunhuang was seized by the Tibetans in 787.[19] At the Mogao Caves, about 110 caves were constructed during each of the two periods, significantly outnumbering some forty caves of the two preceding centuries in quantity.[20] As the connections between Dunhuang and the metropolitan areas of the unified Sui and Tang empires were established, new cave designs were introduced and popularized at Dunhuang. Two colossal image caves—each enshrining a colossal Buddha image of 35.5 m or 26 m high—were constructed respectively in 695 and 721–725. They utilized the cliff areas to the south of the preexisting cave clusters. At least a multileveled pavilion was built in front of the larger one of them (Cave 96) and became a landmark of the cave landscape.[21] The minor caves—most of which are hall caves (*diantang ku* 殿堂窟) with niches—were mostly distributed north to the preexisting caves and in-between the two colossal image caves (Figure 4).[22] The cave construction regularly sprawled in two levels in the middle part of the cliff face, and their porches would have been linked by overhanging passageways.

As the most common type of cave-front architecture, the porched antechamber is historically known as "*kuyan* 窟簷" (lit. cave-eave), after the overhanging eaves of the pitched roofs.[23] Most of the antechamber has a rectangular plan of one to three bays wide and one bay deep. Judging from the extant examples, the top ridge and the long eaves of its roof—hipped or gabled—are parallel with the cliff surface (Figure 5). An interior space is defined by the rock-cut floor, the rear half of rock-cut walls and ceiling, and the front half of timber-structured walls and roof. The interiorized antechamber provides additional space for murals and statues. Since the threshold is moved to the antechamber, the corridor walls and ceilings are fully available for mural painting. This spatial adjustment had a lasting impact on the pictorial programs of the Dunhuang caves; images of protective deities, donor portraits, offering figures, preaching scenes, and miraculous images were incorporated into the transitional spaces.

While most extant examples and traces result from renovations in the ninth and tenth centuries, the porched antechamber was integrated into cave design at latest during the Sui period and widely applied to the cliff site in the following period.[24] As Tang-period Dunhuang manuscripts report, "carved eaves emerged" (diao yan huachu 雕簷化出) and formed the scenic view of "opened thresholds connected for pilgrimage tours" (xukan tonglian, xunli youlan 虛檻通連, 巡禮遊覽).[25] Particularly, two rows of Tang caves connected by linked antechambers were constructed onto the hundred-

14 Xiao, *Dunhuang jianzhu yanjiu*, 53–59; Ma, *Mogao ku shi yanjiu*, 39-40; Ma, *yingzao shi daolun*, 54–59; Ma, "yingzao shiliao qianlun," 150–151.

15 Apart from a few image caves, most of the caves in the northern section served as meditation caves, vihara caves (monastic living quarters), funerary caves, and storages. Peng Jinzhang and Wang Jianjun, *Dunhuang Mogao ku beiqu shiku* (Northern Section of the Dunhuang Mogao Caves), vol. 1 (Beijing: Wenwu chuban she, 2000), 338–351.

16 Chen et al, "kancha baogao," 62.

17 Chen et al, "kancha baogao," 63. For the elevation drawings of the complete set of facades, some of which have been removed during the past century, see *Eluosi guo li Ai'ermitashi bo wu guan cang Dunhuang yi shu pin* (Dunhuang Art in the Collections of Hermitage Museum of Russia), eds. Gosudarstvennyĭ Ermitazh, and Shanghai guji chuban she, vol. 4 (Shanghai: Shanghai guji chuban she, 1997–2005).

18 Sun, "kuyan jianzhu yiji."

19 Ma, *Mogao ku shi yanjiu*, 72–90.

20 Wang Huimin, *Dunhuang fojiao yu shiku yingzao* (Dunhuang Buddhism and Cave Construction) (Lanzhou: Gansu jiaoyu chuban she, 2013), 205–318.

21 Peng, Wang, and Guo, "jiucenglou laogu xin faxian;" and Pan and Ma, *kuqian diantang,* 68–60.

22 For cave types, see Xiao, *Dunhuang jianzhu yanjiu*, 35–60; and Rong Xinjiang, *Eighteen Lectures on Dunhuang* (Leiden: Brill, 2013), 427–437.

23 Ma, *yingzao shi daolun*, 57; Ma, "xin dade zao kuyan jiliao."

24 Sun, "kuyan jianzhu yiji," 21.

25 Excerpts from "Datang zongzi longxi lishi zaixiu gognde bei 大唐宗子隴西李氏再修功德記碑" (Stele Recording the Merit of Cave Renovation by the Li Family from Longxi, P.4640) and "Dunhuang lu 敦煌錄" (Records of Dunhuang, S.5448). Zheng Binglin and Zheng Yinan, *Dunhuang bei ming zan jishi* (Collection and Annotation of the Stele Inscriptions and Eulogies in Dunhuang), 3 vols (Shanghai: Shanghai guji chuban she, 2019), 229; and Zheng Binglin, *Dunhuang dili wenshu huiji jiaozhu* (Annotated Collection of Dunhuang Documents about Historical Geography) (Lanzhou: Gansu jiaoyu chuban she, 1989), 86.

meter-long cliff between the two colossal image caves.[26] They evoked the imagery of "overhanging pavilions and doubled passageways"(xuange chongxuan 懸閣重軒).[27]

Such an imagery is represented by a refurbished mural in Mogao Cave 275. Conducted at some point before the late-seventh century, the repainting on the east wall of the fifth-century cave represents a gathering scene in a mountain monastery.[28] Despite being severely defaced, the picture clearly depicts a long, two-story building amid mountains and waters as the spatial setting of the gathering (Figure 6). The frontally shown building is sandwiched between two narrow registers of triangular mountain peaks above and a wavy stream below. The building appears to be a timber-and-masonry hybrid structure of a large width. At least six bays of the upper level and five bays of the lower level are represented, and no gable wall is depicted to indicate where the long façade terminates. Architectonic forms are well articulated and proportioned for a believable built environment: the bracket-sets on top of the columns, the rafters represented by two rows of small circles, and the railings articulate a two-storied, timber-structured porch. Moreover, the wooden doorframes embedded into the edge-beveled wall indicate that the wall from which the porch protrudes is thick and solid. The relatively simple types of bracket-sets, doors, and rafters in the painting are echoed in the actual wooden members in a few early caves and the pictorial rafters painted in the ceilings of their antechambers.[29]

The painting may represent either the cave-front or the standalone architecture, yet it sheds light on the impression of the Mogao cave site before the late-seventh century, especially regarding the built environment and the activities that occurred within. The landscape is not different from that of the Mogao site, which is fronted by the Daquan River and backed by the sand dunes of Mount Mingsha. The long porch matches the main feature of the cave site before the advent of the colossal image caves, namely, horizontal spawls of caves above the ground level. In front of the building are depicted fourteen (originally twenty-one) monks in two rows. The legible words in the cartouches beside the figures, such as "*Bikkhu* Dao (name) …" (比丘道……) and "the image of *bikkhu*…" (比丘……像),[30] indicate they represent specific monks likely from the local Buddhist society. Most of them are seated facing the monk priest in the center of the upper row, toward whom three small figures in the lower register are bowing. The gathering represents the moment of a Buddhist sermon or an ordination ceremony.[31] While combining architectural and environmental elements in accord with the actual cave site, the painting renders an ideal seclusion in mountains for concentrated meditation and study that would lead to spiritual accomplishment.

The Colossal Image Pavilion in the Tang Dynasty

The horizontal and relatively even distribution of caves has always been a basic pattern in the architectural appearance of the Mogao Caves. However, they soon became dwarfed by the multilevel pavilion screening the colossal image cave. This kind of structure is historically known as "daxiang tangdian 大像堂殿" (colossal image hall) and now commonly referred to as "colossal image pavilion."[32] The early-Tang version of the colossal image pavilion at Mogao has left little trace, but one can still discern its basic layout and composition based on the rock-cut parts, platform remains, current structure, and textual descriptions. The archaeological remains in front of the two colossal image caves indicate that their front-halls were five bays wide, dwarfing most other porches that are one or three bays wide. The ground-level floor area of each pavilion is no less than 200 square meters, which is comparable to a monumental, freestanding hall (Figure 7).[33] The ground level space would have served as a spacious entrance-hall enshrining gigantic images of Buddhist guardians.[34] A modernly reconstructed pavilion of the grander Cave 96, despite different in the numbers of eave levels, well illustrates the spatial elements of its medieval predecessor (Figure 8). The carving of a rock-core image of the Future Buddha Maiteya seated with pendent legs produced

26 Su Bai, "Mogao ku ji ba" (Preface to "Record of the Mogao Caves), *Wenwu cankao ziliao* 54, no.2 (1955): 119.

27 "Datang zongzi longxi lishi zaixiu gognde bei" (P.4640). Zheng and Zheng, *Dunhuang bei ming zan,* 229.

28 Fan, Jinshi and Cai Weitang, Huang Wenkun, *Mogao ku di 266–275 ku kaogu baogao* (The archeological report of Mogao Caves 266–275) (Beijing: Wenwu chuban she, 2011), 211–213, fig. 154; and Zhao Rong, "Dunhuang Mogaoku di 275ku dongbi canhua neirong shixi" (Analysis of the remaining painting on the east wall of Dunhuang Mogao Cave 275), *Sichou zhilu yanjiu jikan* 5 (2020): 376–394.

29 Sun Yihua and Sun Ruxian, *Dunhuang shiku quanji: shiku jianzhu juan* (A Complete Collection of the Dunhuang Caves: Volume on Cave architecture), vol.22, ed. Dunhuang Academy (Hong Kong: Hong Kong Commercial Press, 2003), 71–81; Sun Yihua and Sun Ruxian, "Mogao ku beizhou di 430 ku ku-men kaozheng" (Investigation of the door of Mogao Cave 430 of the Northern Zhou period), *Dunhuang Yanjiu* 174, no.2 (2019): 71–75; Sun, "kuyan jianzhu yiji," 22.

30 Fan and Cai, *di 266–275 ku,* 212. *Bikkhu* is a Sanskrit word meaning "a fully ordained monk."

31 Zhao, "di 275ku dongbi."

32 "Dunhuang lu 敦煌錄" (Record of Dunhuang, S.5448). Transcription in Zheng, *Dunhuang dili wenshu*, 86.

33 The platform fronting Cave 96 is sized about 21.4 m (l.) by 9.2 m (w.) and that of Cave 130 is sized 21.6 m (l.) by 16.3 m (w.) Peng, Wang, and Guo, "jiucenglou kaogu xin faxian"; Pan and Ma, *kuqian diantang,* 49.

34 Remains of four gigantic statues of the four heavenly kings over six meter tall were excavated in Cave 130. They are dated to the Guiyijun period, but the tradition of furbishing the antechamber with guardians' statues can trace back to the Sui period, as seen in Cave 427 (Figure 5). Pan and Ma, *kuqian diantang,* 53–54.

a rock-cut shaft as the main chamber and two corridors one above another. The colossal Buddha is enclosed by an over 40 meters high pavilion of composite materials. The pavilion consists of a thick masonry wall built onto the rock-cut front wall that supports the cantilevered roof and façade structures, a timber-structured pitched roof, and a multilevel pavilion-like porch that screens the corridors opened onto the masonry and rock-cut walls. It is grand in scale, composite in structure, and has a complex history of renovation.

The Dunhuang colossal image pavilion corresponds with the making of colossal image caves in Tang China which prompted a new type of cave-front architecture. In the fifth century, colossal buddha images pervaded the silk road, as major cave sites all were centered around a colossal image cave in Central Asia and China.[35] Yet it is in the Chinese cave sites that the colossal image cave was known to have a terraced building in front of it. The colossal image cave of Shicheng-si 石城寺 in Shanxi 剡溪 (Zhejiang province) is an early example reported to have "structured three levels of terraces in front of the niche, and built an entrance-pavilion and hall" in 513–516 CE.[36] If the sixth-century building was relied on terraces, then the construction of a colossal image cave under the Tang imperial patronage, namely the Fengxian Temple 奉先寺 of the Longmen Grottoes 龍門石窟 (Henan province) marked the maturation of the timber-structured pavilion. Commissioned by Emperor Gao and Empress Wu of the Tang period in 675 CE, the colossal open-air cave enshrines a nine-figure group centered at a 17 meters tall statue of the Cosmic Buddha Vairocana. The high visibility of the colossal images was soon intervened by a set of timber-structured facades and roofs (Figure 9). According to archaeologist Peng Minghao, the modification was made during the reign of Emperor Xuanzong (r,712–756), who was the successor and opponent of Empress Wu, in the eighth century.[37] The implication for Dunhuang is not only the transmission of the architecturally screened colossal image cave to the northwest frontier of the Tang Empire, but also the architectural practice as a means of visual control of a cave landscape.

Unlike the single-level façade of the Longmen colossal image, the Dunhuang colossal image pavilion featured a multi-tiered verticality. The Tang-period pavilion of Mogao Cave 96 seemed to have four levels, as a ninth-century renovation record reports that "the old pavilion again had four levels of flying (eaves)."[38] Another tenth-century Dunhuang manuscript mentions three parts of the colossal image pavilion: (1) "daxiang tianwang 大像天王" ([Hall of] the Heavenly Kings of the Colossal Image), (2) "daxiang xiaceng 大像下層" (the lower level of the Colossal Image), and (3) "daxiang shangceng 大像上層" (the upper level(s) of the Colossal Image).[39] The words respectively correspond to the entrance-hall, the second-level porch overhanging from the cliff surface, and the porch of the upper levels standing above the rock-cut terrace and overhanging from the masonry wall. They give a sense of the multi-tiered composition of structures screening the vertical shaft. By the strategy of subdivision, the colossal image pavilion provides various ground levels for viewing the colossal image's feet, hand, chest, and head. Moreover, each level of it serves as an intermediate-sized liaison between the colossal cave and the surrounding caves.

The lesser colossal image in Cave 130 has a rock-cut ceiling and front wall onto which three levels of corridors were cut out. The features suggest that its frontal structure would have been similar regarding the multi-tiered composition but lesser in height, less covered by a timber-structured enclosure, and fewer levels. In addition, Cave 130 was excavated at least three meters above the ground level at the time of its construction and therefore its pavilion was added later and no earlier than the late-ninth century.[40] By inference, the Cave 96 pavilion was the singular architectural monument at Mogao by the end of the high-Tang period; due to an unparalleled height, it outstood a horizontal sprawl of some three hundred caves. Even in the following centuries, its visual predominance has not been surpassed by any other gigantic entrance-halls or multilevel pavilions. As art historian Wu Hung insightfully points out, the colossal image cave architecture introduced monumental scale, vertical space, and platformed architecture on the ground level. It henceforth became the symbolic language of power and the crest of a hierarchical spectacle.[41] One remarkable feature of the colossal image pavilion to be further discussed in the next section is the constant renovation. It counteracted the material ephemerality and reenacted the architectural and social spectacle, especially during the

35 For major cases and historical records, see, for example, Sherman E. Lee, *A History of Far Eastern Art*, 5th ed., ed. Naomi Noble Richard (New York: Prentice Hall: H.N. Abrams, 1994), 151–88; Ken Parry, "The Buddha as Colossus in Central Asia and China," in *Art, Architecture and religion along the Silk Roads,* ed. Ken Parry (Turnhout, Belgium; North Ryde, N.S.W: Brepols; Ancient History Documentary Research Centre, Macquarie University 2009), 179–198.

36 龕前架三層台, 又造門閣殿堂. *Gaoseng zhuan* 高僧傳 (Biographies of Eminent Monks) compiled by Huijiao 慧皎 (497–554), vol. 13. *Taishō shinshū daizōkyō*, 100 vols., eds. Takakusu Junjirō, Watanabe Kaigyoku, et al., (Tokyo: Taishō issaikyō kankōkai, 1924–1932. Hereafter "*T*") no. 2059, vol.50, p.412, b, ll.12–13.

37 Peng Minghao and Li Ruoshui, "Longmen fengxian si da lushena xiangkan tangdai de buzao yu jiajian" (Supplementary Construction of the Vairocana Buddha niche of the Fengxian Temple of the Longmen Grottoes in the Tang dynasty), *Kaogu* 233, no. 2 (2020): 112–120.

38 舊閣乃重飛四級. Excerpt from "Zhang huaishen bei 張淮深碑" (Zhang Huaishen Stele, P.2862). Ma, "Dunhuang yishu mogao ku suishou randeng wen ji shi," 65–66.

39 "Laba randeng fenpei kukan mingshu 臘八燃燈分配窟龕名數"(List of Caves for Distributing Lanterns during the Light Up on the Eighth Day of the Twelve Month, 951 CE) is in the collection of the Dunhuang Academy (no.0322). For transcription and analysis, see Jin, "Dunhuang kukan mingshu kao;" and Ma, *Mogao ku shi yanjiu*, 146–50.

40 Pan and Ma, *kuqian diantang,* 59.

41 Wu Hung, *Kongjian de Dunhuang: zhoujin Mogao ku* (Spatial Dunhuang: Approaching the Mogao Caves) (Beijing: Sanlian chuban she, 2022), 87–91.

second peak period of construction and renovation.

Colossal Image Pavilions and Ante-Halls in the Guiyijun period

Following the intensive cave construction in the Sui and Tang periods, the climax of cave-front architecture occurred in the tenth century.[42] Dunhuang became the seat of a tributary state of the Tang and subsequent dynasties known as *guiyijun* 歸義軍 (lit. Return to Righteousness Army) in 851–1036.[43] Intensive construction activities took place at the Mogao Caves when the Guiyijun Circuit was under the Cao regime since 914. The Cao-family Guiyijun period saw the construction of about a dozen gigantic hall caves and an unprecedented scale of construction and reconstruction of ante-halls and porches, all unified under a half-mile-long stripe of exterior mural.[44]

In this period, the colossal image cave and their pavilions was systematically renovated. Dunhuang manuscripts record two major renovation of the Cave 96 pavilion commissioned by the Guyijun Military Governors Zhang Huaishen 張淮深 (831–890) in the third quarter of the ninth century and Cao Yuanzhong 曹元忠 (d. 974) in 966.[45] The latter renovation, which entailed three hundred builders, patrons of almost all social strata, and feasts, was a spectacle in its own right. Correspondingly, the large platform remains indicates that both pavilions were extravagantly renovated in the late-medieval period, which archaeologists initially suggested to be the Xixia period (1036–1227).[46] A more accepted view predates the renovation of Cave 130 to the end of the Guiyijun period, specifically, during the reign of Cao Zongshou 曹宗壽 in 1002–1014.[47]

New evidence for this dating are some bracket-set components that belonged to the frontal architecture of Cave 130 (Figure 10). In winter 2022, the author and a few scholars of the Exhibition Center of the Dunhuang Academy noticed a bracket-arm and a few bracket-blocks in a storage cave at Mogao.[48] A modern inscription on the bracket-arm identifies that it was found "on the stairs of Cave 130 in 1955."[49] Since no extant timber members of the colossal image pavilion was known prior to this point, the little discovery is particularly revealing of the architectural style and modularity of the architecture. They were probably taken from timber structures around Cave 130 or left-over materials from the construction. Three arms seem to serve as paving of the stairs in a rock-cut tunnel of Cave 130 for a long period of time, during which one side of the arms was worn down. The arm measures 88 cm (l.) by 12 cm (w.) by 17 cm (h.) and the blocks measure 18 cm (l.) by 18 cm (w.) by 8 cm (h.). The measurement unit (*caifen* 材分) of the timber members roughly complies with the seventh grade (17.3 x 11.5 cm) as prescribed in *Yingzao fashi* 營造法式 (*Building Standards*), an architectural treatise compiled in 1103.[50] This module is applied to most extant Mogao timber-structured porches dated between 970–980. The Cave 130 arm's section size (17 x 12 cm) is close to that of Caves 431 (18.5 x 12 cm) and that of Caves 427 and 196 (18 x 12.5 cm).[51] While all other known examples are concentrated in the central-north part of the southern section, the bracket-set components of Cave 130 demonstrates that the similar timber-façade construction extended to the southern part where Cave 130 is located. By inference, the modularity and the timber-construction system applied to large and small cave-front architecture of the Mogao complex during the late-Guiyijun period were remarkably consistent.

The design of the colossal image pavilion was also reinvented; additional levels and height testify to extended verticality. The Cave 96 pavilion was adapted from a four-level structure to a five-level structure in the late-ninth century.[52] Hence, it was referred to as a "five-story *ge*-pavilion of the immortals" (wuceng xiange 五層仙閣) in a mid-tenth century Dunhuang manuscript.[53] The rhetoric of "immortal" (xian 仙)

42 Ma, *Mogao ku shi yanjiu,* 113; Sun, "kuyan jianzhu yiji," 21–22; and Sonya S. Lee, "Repository of Ingenuity: Cave 61 and Artistic Appropriation in Tenth-Century Dunhuang," *Art Bulletin* 94, no. 2 (2012): 199–225.

43 For Dunhuang history of the Guiyijun period, see Rong, *Eighteen Lectures,* 40–46.

44 Sun and Sun, *shiku jianzhu juan,* 127–140; Chen et al, "kancha baogao," 56; and Pan, "Mogao ku waimao bianqian."

45 新增則橫敞五層, 高低得所. Excerpt from "Zhang huaishen bei" (P.2862). Ma De, "Dunhuang yishu Mogao ku suishou randeng wen ji shi" (Collection and Identification of the Lantern Lighting Texts at the Mogao Caves from the Dunhuang Documents), *Dunhuang yanjiu* 53, no.3 (1997): 65–66; Sun, "kuyan jianzhu yiji," 20; and Ma De, "Song qiande simian chongxiu Dunhuang bei daxiang de erqi gongcheng" (Second Phase of Renovation Project for the Northern Colossal Image in the Fourth Year of Qiande of the Song Dynasty), *Dunhuang yanjiu* 81, no. 5 (2003): 1–2.

46 Four layers of platforms were excavated in front of Cave 96, and the second lower level is dated to the Xixia period in Peng, Wang, and Guo, "jiucenglou kaogu xin faxian." Two layers of platforms were excavated in front of Cave 130, and the lower level is dated to the Xixia period in Pan and Ma, *kuqian diantang*, 48–60. The lower-level ante-hall was likely a refurbishment of an earlier version, as under-painting remains on the west wall is dated by style to the late-Tang period.

47 Ma, *Mogao ku shi yanjiu*, 152; He Shizhe, "cong yitiao xin ziliao tan cangjingdong de fengbi" (A New Material about the Concealment of the Library Cave), *Xibei shidi* 14, no.3 (1984): 83–86; Dunhuang Academy ed., *Dunhuang Mogao ku gongyangren tiji* (Donor Inscriptions in the Dunhuang Mogao Caves) (Beijing: Wenwu chubanshe, 1986), 231; and Sha, *Guiyijun shiqi*, 31–49.

48 The storage cave is Mogao Cave 4. It is a large image cave on the ground level that was turned into a storage of archaeological findings of the Mogao Caves by the Dunhuang Cultural Relics Institute in the twentieth century.

49 I thank Sha Meizhen, associate researcher in the Collection Department, for identifying the content in the inscription.

50 Liang, *A pictorial History*, 14–18; and Steinhardt, *Chinese Architecture*, 150–161.

51 Xiao, *Dunhuang jianzhu yanjiu*, 280–281.

52 Sun, "kuyan jianzhu yiji," 20; Ma, "suishou randeng wen," 65–66. The way in which the fifth level was added is not illuminated by any textual or visual evidence, but it is possible that an eave was added to the upper part of the façade and the height of every level was accordingly adjusted. This is the strategy of the redesign in 1927–35 that turned another five-level version of the Cave 96 pavilion into a nine-level one.

53 "Hexi jiedushi linggong lingyan randeng wen河西節度使令公靈岩燃燈文" (Hexi Military Governor Master Ling Lighting Lanterns at Lingyan (the Numinous Cliff), S. 4625, 945–950 CE). The manuscript writes "wugexianceng 五閣仙層," which is likely meant to be "wucengxiange 五層仙閣." For the transcription, dating, and identification of the "Five-Story *Ge*-Pavilion," see Ma, "suishou randeng wen," 63–66.

associates the tall building with high spirituality. Meanwhile, an order for the architectural spectacle was needed, especially during an intensive cave construction period. The visual effect of adding the fifth level was that "the high and the low received their places" (gaodi desuo 高低得所).[54]

The vertical expansion of the Cave 130 pavilion gives us a hint of how "the high and the low received their places." During a renovation of the upper-level porch in 2004, the remains of a small shrine standing on the cliff top above Cave 130 was excavated.[55] These kinds of cliff-top shrines were not constructed at the Mogao site before the Tibetan period (787–848). It was the advent of a cliff-top pagoda above Cave 161—a neighboring cave in the immediate north of Cave 130—in the Tibetan period that reshaped the skyline of the vicinity (Figure 10).[56] Regarding the typology and style, the cliff-top shrine above Cave 130 seems to be a later construction, because the central altar in it is similar to those in the central-altar caves popular during the Guiyijun period. The cliff-top shrine was most likely constructed when the colossal image pavilion of Cave 130 was renovated. The cliff-top shrine, although being structurally independent from the colossal image pavilion, turned a three-level structure into a four-level one. Based on the cliff's topography and archaeological remains, I made a theoretical reconstruction of the composite architecture (Figure 11).[57] It consists of three structures, namely, a pitched-roofed shrine standing on the cliff top, a three-bay porch on an elevated rock-cut terrace that screens the top-level corridor, and a five-bay, two-level pavilion on the ground level that screens the two lower levels of corridors. The reconstruction design illustrates the effect of the additional level of a colossal image pavilion: it helps the pavilion to reseize its visual prominence in the cave complex. The pavilion was carefully redesigned to reflect an updated architectural order of the cave landscape.

Not just through the competition of height, but also through correspondence of scale was the architectural spectacle updated during the Guiyijun period. Along with the construction of monumental-scale caves, an enlarged version of the porched antechamber emerged—that is, a porticoed entrance-hall standing on a platform or an elevated terrace. While modern scholars refer to them as "*kuqian diantang* 窟前殿堂" (ante-hall),[58] medieval cave-makers rendered them as "fenglou 鳳樓" (phoenix *lou*-pavilions).[59] The historical term gives a sense of the overhanging roof, the polychromic painting, and the sheering height. An ante-hall is usually three bays wide and two bays deep, and the extra-large ones reach five-bay wide and three bay deep. In comparison to the porched antechambers, an ante-hall is significantly more accessible and spacious, and thereby prolonging the central axis of a cave-temple (Figure 13). Therefore, the ante-hall was less a drastic contrast than a secondary companion to the colossal image pavilion; the advent of ante-hall turned the polarized architectural landscape into a spectrum comprising three scales or even more.

The ante-hall's impact on the architectural spectacle was significant. Archaeological excavations have uncovered at least twenty-six ante-halls in the southern section.[60] Judging from the remains of their platforms, the ante-halls covered almost the entire length of the southern section. Recognizing the integrated construction of cave and ante-hall in the Guiyijun period, archaeologist Sha Wutian concludes that the bipartite paradigm represents a mature form of Sinicized Buddhist cave architecture.[61] While this statement is reasonable, one should not ignore the site conditions that accelerated the maturation of this building type and subsequently benefited from its wide application. It was following the renovation of the colossal image pavilions that the cave patrons commissioned some of the early ante-halls.[62] Thus it is difficult to deny the possibility that the spacious ground level of the colossal image pavilion set a model for the subsequent ante-hall design. The grandest of the ante-halls were commissioned by the Guiyijun leaders and high-rank officials. They were clustered around the "five-story *ge*-pavilion" of Cave 96 and their platforms connected

54 "Zhang Huaishen bei" (P.2862). Ma, "suishou randeng wen," 65–66.

55 Sun, "kuyan jianzhu yiji," 23.

56 Zhao Xiaoxing recognizes the vertical cave-pagoda compound as a new type of cave architecture since the Tibetan period in "Dunhuang tubo shiqi ta, ku chuizhi zuhe xingshi fenxi tanxi—Tubo tongzhi dunhuang shiqi de mijiao yanjiu zhi wu" (A preliminary study of the Vertical Configuration of Cave and Pagoda during the Tibetan Period at the Mogao Caves—the Fifth in the Series Studies of Esoteric Buddhism at Dunhuang during the Tibetan-Occupied Period), *Zhongguo zangxue* 102, no.3 (2012): 94–98.

57 The only other reconstruction study on the cave-front architecture of Cave 130 the author knows is Yan Ting, "Mogao ku kuqian jianzhu baohu sheji: cong Dunhuang Mogao ku 130 ku kuqian jianzhu baohu sheji kaishi" (Conservation Design of the Frontal Architecture of Mogao Caves: Starting with the Conservation Design of the Frontal Architecture of Cave 130) (master's thesis, Kunming Science and Technology University, 2013). One of the reconstruction designs Yan proposes has a three-level timber-structure façade but it does not take the cliff-top shrine into consideration. In addition, Yan's designs mainly concern cultural heritage management, whereas the author's proposal complies with the architectural studies of porches and ante-halls as listed in footnote no. 7.

58 Pan and Ma, *kuqian diantang*.

59 This term appears in, for example, "Zhang Huaishen zaoku gongde bei 張淮深造窟功德碑" (Stele Recording the Merits of Cave Construction by Zhang Huaishen, P.3720, S.5630, ca. 882 CE) and "Hexi dusengtong dangquan jiankan shangliang wen 河西都僧統宕泉建龕上樑文"(Text on a General Buddhist Commander completing the construction of a cave-temple at Daquan (i.e.the Mogao Caves), P.3302v, 933 CE). *Lou* 樓 and *ge* 閣 are storied buildings. In Tang period, *lou*-pavilion refers to a multilevel pavilion with waist-eaves on every level, whereas *ge*-pavilion refers to that without any waist-eaves. But the names have been used interchangeably since the middle period in China. Sun Ruxian and Sun Yihua, *Dunhuang shiku quanji: shiku jianzhu juan* (A Complete Collection of the Dunhuang Caves: Volume on Architectural Painting), vol.21, ed. Dunhuang Academy (Hong Kong: Hong Kong Commercial Press, 2001), 136.

60 Eighteen ante-halls (Caves 108, 110, 98, 85, 61, 55, 467, 53, 46, 45, 44, 39, 38, 35, 30–27, 25, 22, 21) were discovered during the 1963–66 excavations, three (Caves 130, 152, 146), two (Caves 72, 76), and two ante-halls (Caves 96 and 94) were found in three later excavations in 1979–80, June–July, and October–November 1999. Besides, the 1951 survey indicates Cave 16 has a layer of tile paving a meter below the ground-level of the current ante-hall.

61 Sha, *Guiyijun shiqi*, 13–14, 19–20.

62 As documented in the Zhang Huaishen Stele (P.3720, S.5630, ca. 882 CE), immediate after renovating the pavilion of Cave 96, that Zhang decided to construct a gigantic cave (Cave 94) to the north of it.

(Figure 14).[63] Rising from the center of a row of monumental ante-halls was the multilevel pavilion that even protruded beyond the top of the cliff.

Perceiving the Architectural Spectacle

The changing appearance and surroundings of the colossal image pavilions prompt us to reflect on the perception of the architectural spectacle of the Mogao complex. As early as three years after the construction of Cave 96, beholders began to recognize the vertical visual focus and the conceptual transition of the site: "Cutting the mountain into a pagoda, constructing the heavens from layers of terraces."[64] Pagoda—a Buddhist architectural monument that acquired a predominant height in China—symbolizes *axis mundi* in Buddhist cosmology.[65] The topographical *axis mundi* is Mount Sumeru (*xumi shan* 須彌山), which bears thirty-three vertically aligned realms.[66] Verticality with an ascending tendency is a major formal feature of both the Chinese pagoda and Mount Sumeru. Since the introduction of colossal image caves and pavilions, verticality has pervaded the imagination of the Mogao Caves, a name which literally means "the Caves of Unparalleled Height."

In spite that the cave-temple differs from the pagoda by the construction system and the visual logic, the cave-front architecture recreates sun a "real building" as best as it could. For one thing, the colossal image pavilion evokes the imagination of a pagoda through the elongated pyramidal mass of volume, the vertically aligned porches (from a frontal view), and the multiple levels of overhanging eaves. For another, the pavilion has evolved to take full advantage of the multi-tiered topography of the cliff site, placing timber-structured halls and porches on the "layers of terraces." The multi-tiered construction grants the pavilion some design freedom, as the total height of the building compound is not constrained by a single structural framework. Thus, the pagoda-like appearance could be composed of multiple halls one stacked upon another.

This compositional principle is shared with the imagination of the Buddhist heavens. The diagram of Mt. Sumeru found in several medieval Dunhuang manuscripts represents this cosmological mountain as an elongated terrace-building compound.[67] In manuscript P.2012v (Figure 15), three tiers of waisted rock platforms are stacked to support three sets of heavenly palaces.[68] The total height is further extended by thirty vertically aligned small icons of hipped-roof halls. The large and small halls form a thirty-three-leveled structure, visualizing the Thirty-Three Heavens on Mt. Sumeru. Cave architecture may not convey the image of the heavens as literal as the painting media can do, but it evokes the imagination of unearthly dimensions, which is sometimes so strong that may distort the perception of the actual topography. A widely circulated rumor about the Mogao Caves in medieval China was that "its cliff was as tall as two *li* (ya gao erli 崖高二里)," which equals 900 meters.[69] Perhaps due to the vertical landmarks, the Mogao Caves as a whole was perceived as a tall structure in spite that it was much wider than taller. Caves constructions were constrained within the 30–40m tall cliff area, but the imagination of heavens could turn the width of horizontal sprawl into the height of vertical growth.

University of Chicago

63 For an acute analysis of the siting of caves commissioned by Guiyijun leaders, see Lee, "Repository of Ingenuity," 201–205.

64 磪(砍)山爲塔, 構層台以造天. Excerpt from "Shazhou xiaogu fu jiaowei lijun mogao ku fokan bei bingxu 沙州效谷府校尉李君莫高窟佛龕碑並序" (The Stele and Preface of A Buddha Niche at the Mogao Caves of Li Jun, who is a Military Official at Xiaogu Fu of Shazhou, P.2250 & P.2551V, 698 CE). Zheng and Zheng, *Dunhuang bei ming zan,* 21.

65 Wei-Cheng Lin, "Performing Center in a Vertical Rise: Multilevel Pagodas in China's Middle Period," *Ars Orientalis* 46 (2016): 100–134.

66 In Buddhist cosmology, 28 realms consisting of 4, 18, and 6 levels respectively in the Formless Realm, the Realm of Form, and the Realm of Desire, and the top-level realm in the Formless Realm is further divided into 6 heavens. For a comprehensive overview of Buddhist cosmology, see Akira Sadakata, *Buddhist Cosmology: Philosophy and Origins*, trans. Gaynor Sekimori (Tokyo: Kosei Publishing Company, 1997).

67 A similar example other than the one introduced here is "the Picture of Three Realms and Nine Lands" in Dunhuang manuscript Pelliot chinois 2824.

68 For a discussion of P.2012v, see Liying Kuo, "Maṇḍala et Rituel de Confession à Dunhuang," *Bulletin de l'École Française d'Extrême-Orient* 85 (1998): 230–231.

69 *Ji Shenzhou sanbao gantong lu* 集神州三寶感通録 (Records of the Three Treasures Throughout the Successive Dynasties), compiled by Daoxuan 道宣, *T* no.2106, vol.52, p.418, a, l.26; *Fayuan zhulin* 法苑珠林 (Forest of Gems in the Garden of the Dharma), compiled by Daoshi 道世, *T* no.2122, vol.53, p.387, b, l.25. One *li* in Tang China is approximately 454 meters.

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Figure 1.The timber-structured façade of Mogao Cave 431, showing three-step bracket-sets, a three-bay façade, and an overhanging roof. Dated by inscription to 980 CE. 486 cm(w) x 142 cm (d.) x 320 cm (h.). Wood, mud brick, polychromic pigments. Photo by author, January 20, 2022.

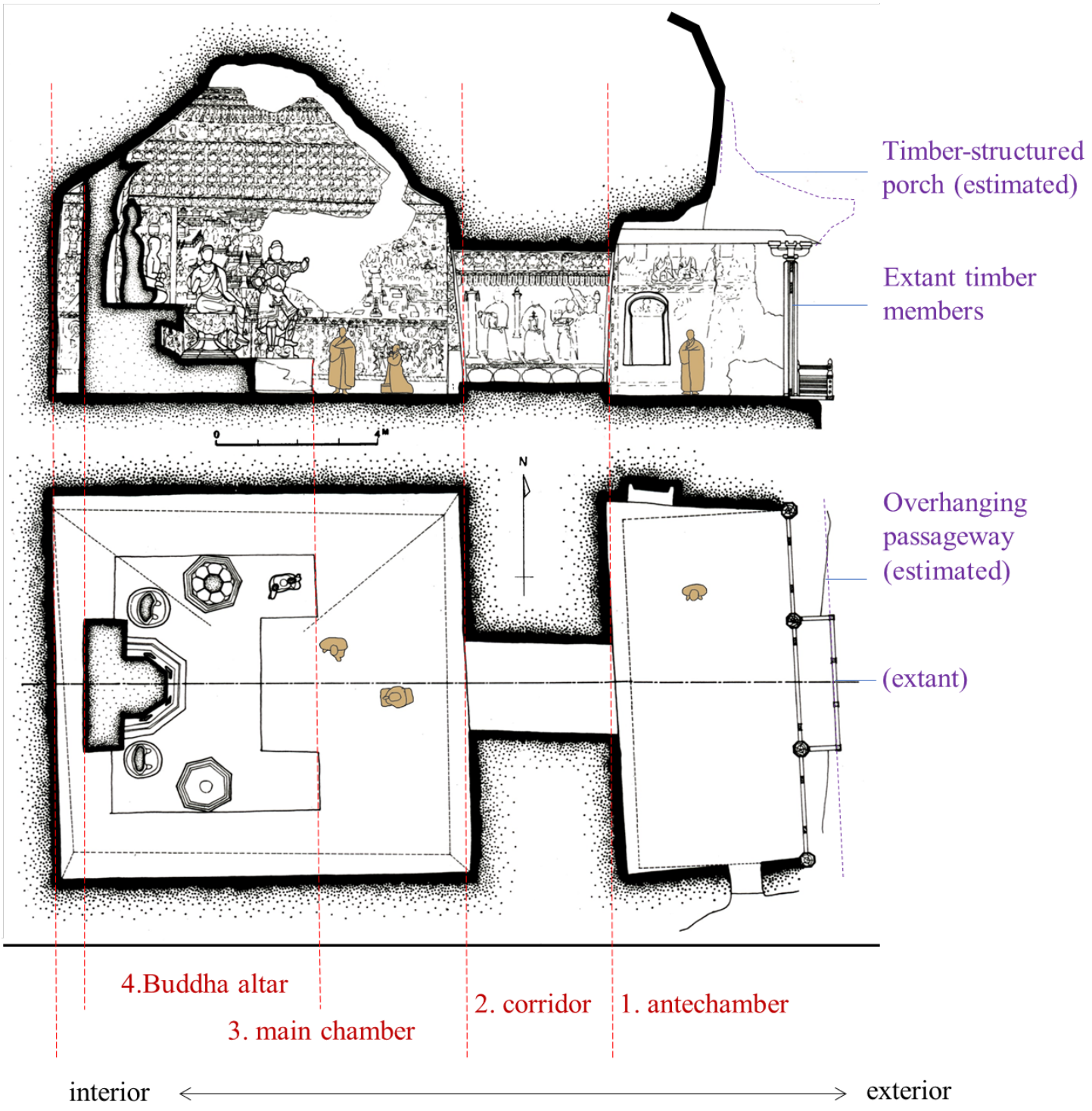

Figure 2. Section and plan drawings of Mogao Cave 196, late-Tang period (851–907). Base map after Dunhuang yanjiu yuan ed., *Zhongguo shiku: Dunhuang Mogao ku*, vol. 4, p. 236; figures and annotations added by author.

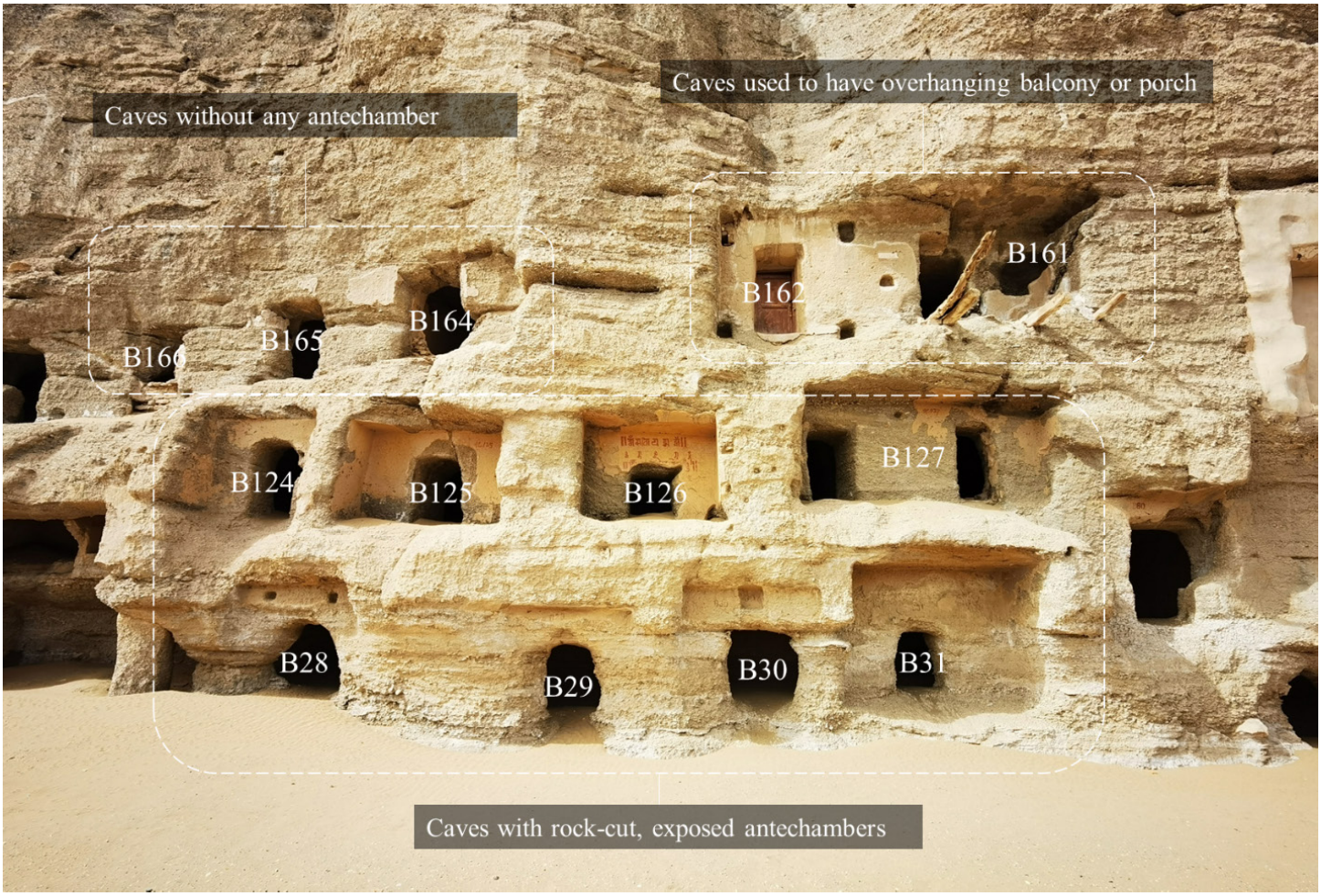

Figure 3. A cluster of caves in the northern section of the Mogao Caves, showing three types of treatments regarding the antechamber. Periods varied and some unidentifiable, constructed after the 6th century, and used until the 14th century. Photo by author, October 13, 2021; annotation by author.

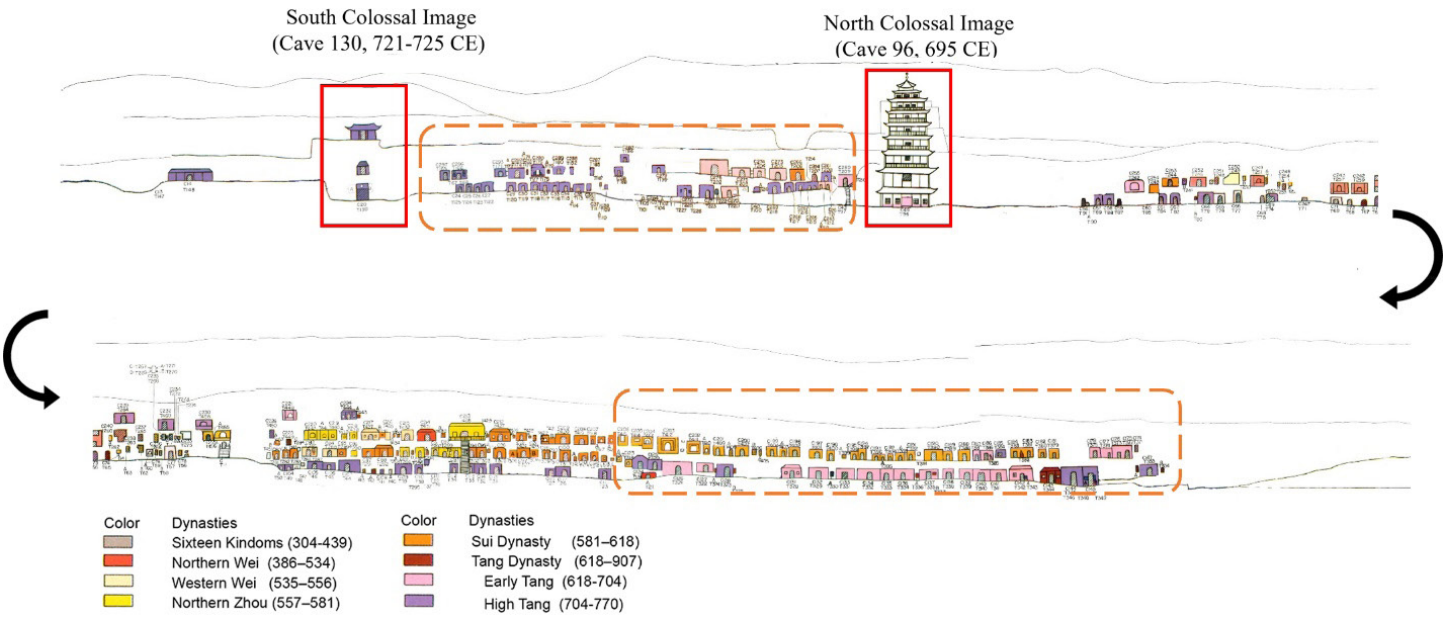

Figure 4. Distribution of the Caves by the end of the high-Tang period, the orange frames with rounded corners mark the major area of cave construction during the Sui, the early- and high-Tang periods. Base map after Shi, *Mogao ku xing*, vol. 2, 8–16, fig. 6; image processed and annotation by author.

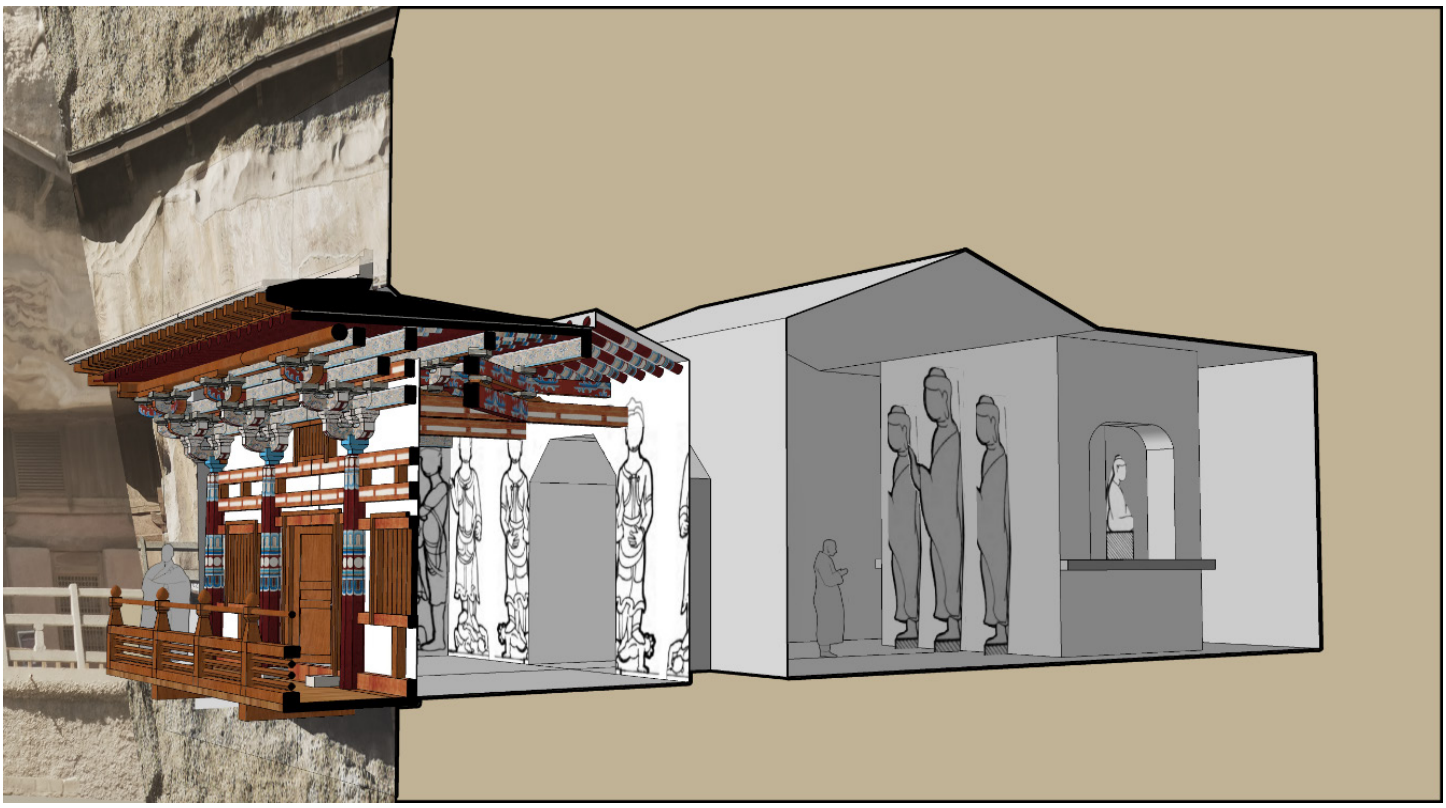

Figure 5. Sectional perspective of a digital model of Cave 427. Main chamber and statues in antechamber from the Sui period, the reconstructed timber-structured porch is dated by inscription to 970 CE. Drawing by author.

Figure 6. Line drawing of the pavilion scene in Mogao Cave 275. Size of remaining mural: 85–101 cm (h.) x 80–102cm (w.). Drawing by Zhao Rong. After Zhao, "di 275ku dongbi," 378, fig. 2.

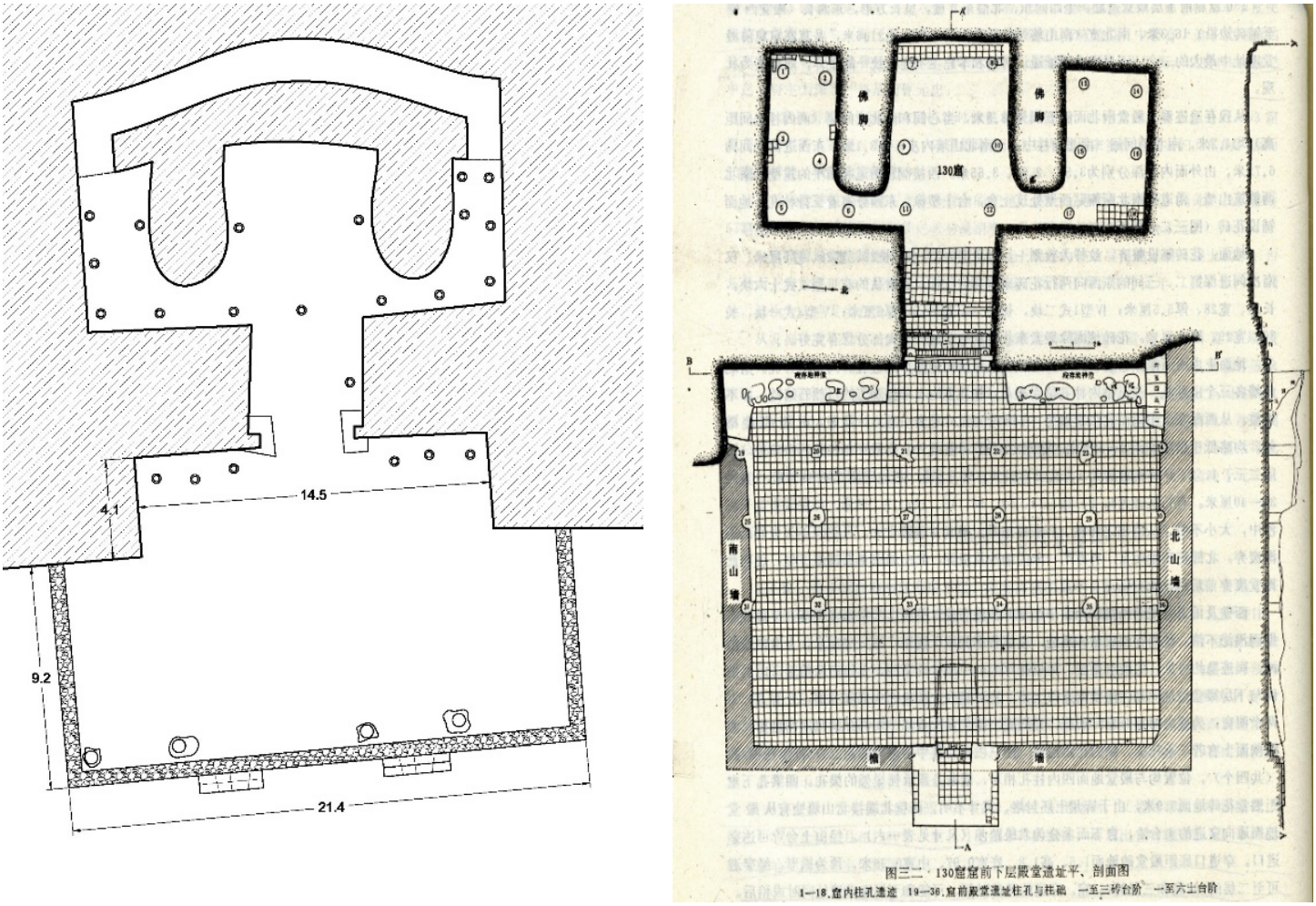

Figure 7. Plan drawings of the bottom-level architectural platform in front of Mogao Caves 96 (left) and 130 (right), respectively dated to the Tang and the Gui-yijun periods. Data collected from the Dunhuang Academy and redrawing by author; Pan and Ma, *kuqian diantang*, 50, fig. 32.

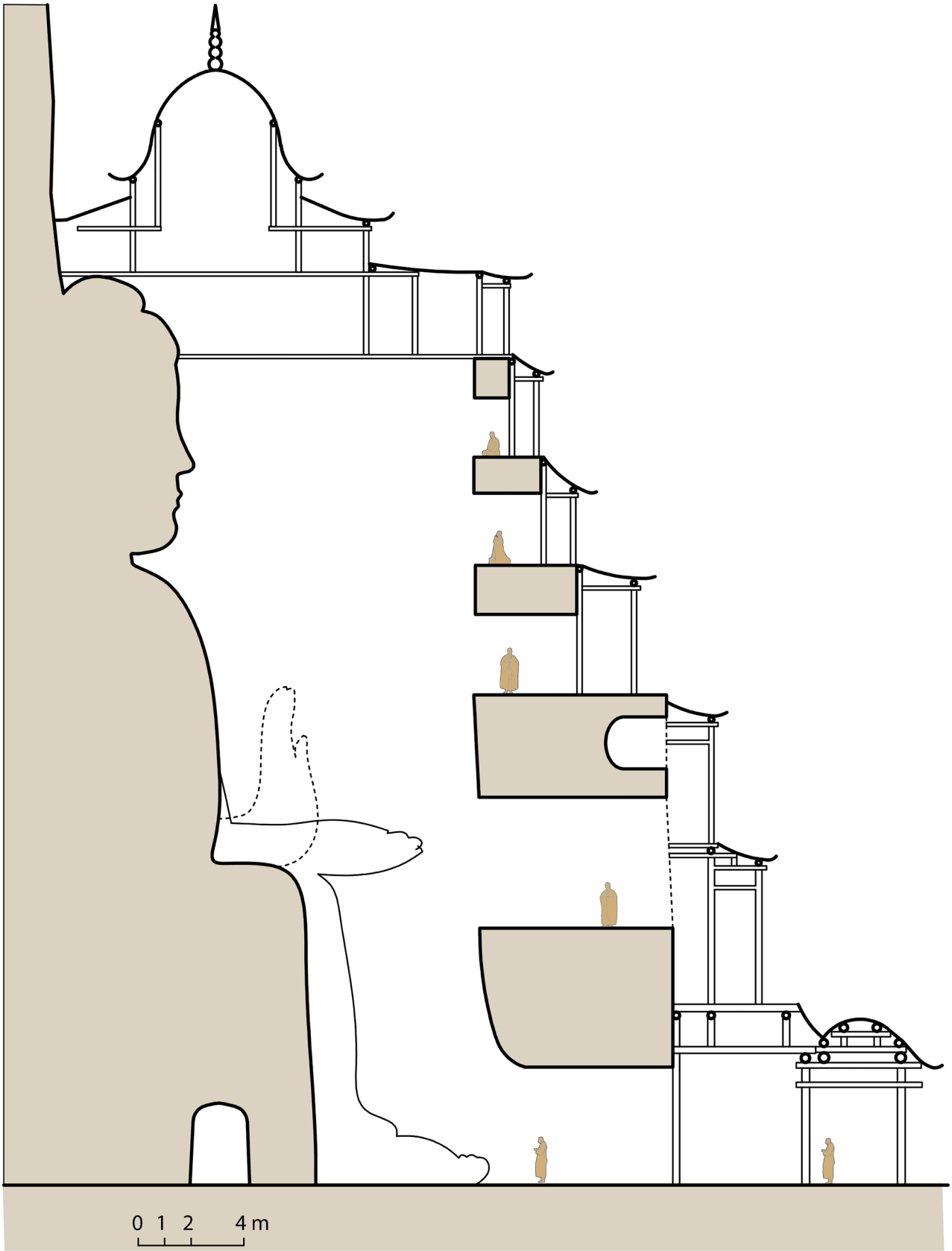

Figure 8. Sectional drawing of Mogao Cave 96, initially constructed in 695, façade reconstructed in 1927–35. Drawing by author.

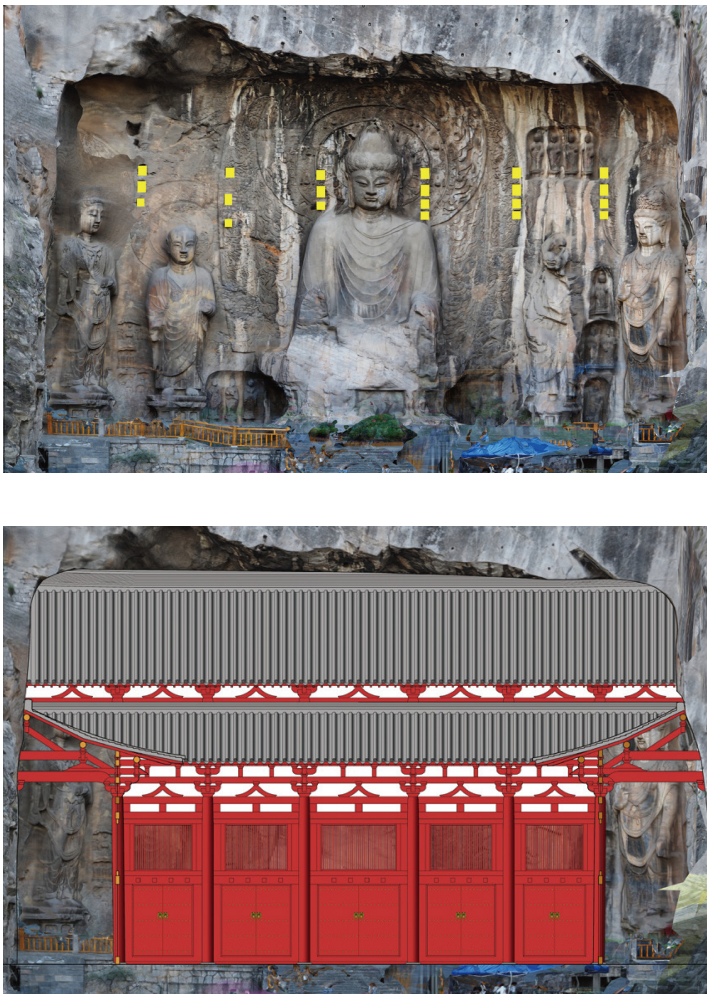

Figure 9. Traces of beam holes in-between the colossal images (left) and a theoretical reconstruction of the timber structure screening the Fengxian Temple of the Longmen Grottoes, showing a double-eave timber porch with two corridors on the sides. Design and drawing by Li Ruoshui. After Peng and Li, "Longmen fengxian si da lushena xiangkan tangdai de buzao yu jiajian," 114–115, figs. 5, 7.

Figure 10. A bracket-set consisting of an arm and three blocks, of which the arm was discovered near Mogao Cave 130. Photo by author, May 11, 2022.

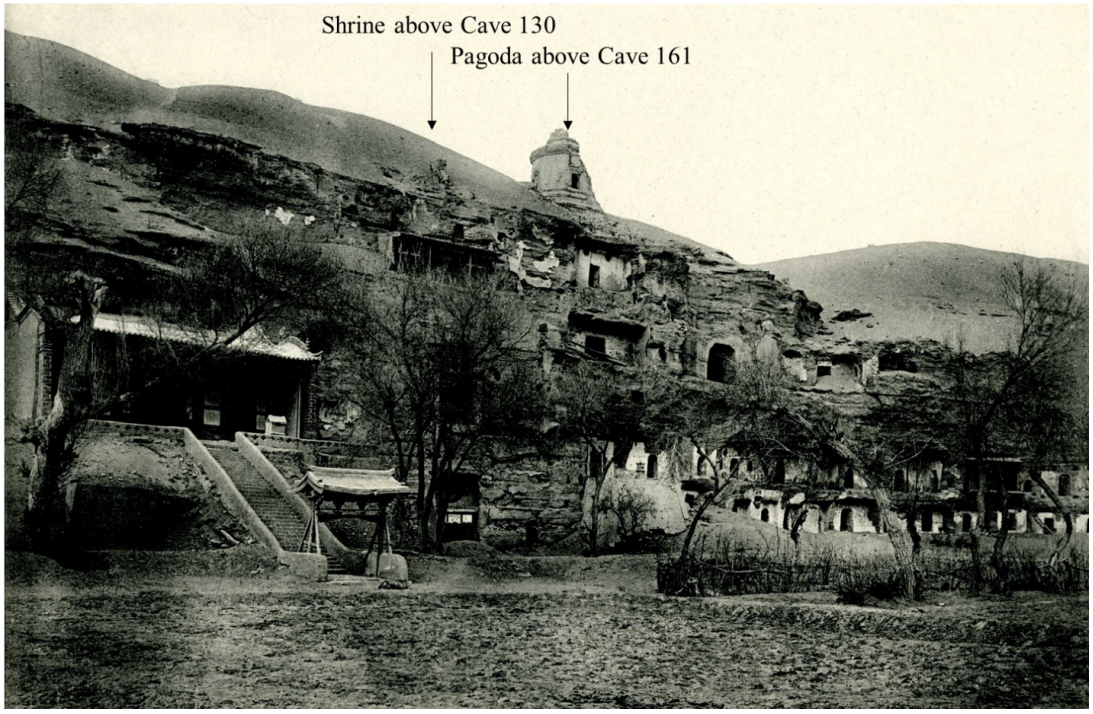

Figure 11. The area near Mogao Cave 130, arrows pointing at remains of two cliff-top structures. Photo by Paul Pelliot in 1908. After Paul Pelliot, Les grottes de Touen-houang: Peintures et sculptures Boudhiques des epoques des Wei, des Tang et des Song, vol. 1 (Paris: Paul Geithner, 1914¬–24), pl. 5; annotation by author.

Figure 12. Theoretical reconstruction of the composite cave-front architecture of Mogao Cave 130, cave constructed in early 8th century, and pavilion in 10th–11th century. Design and drawing by author.

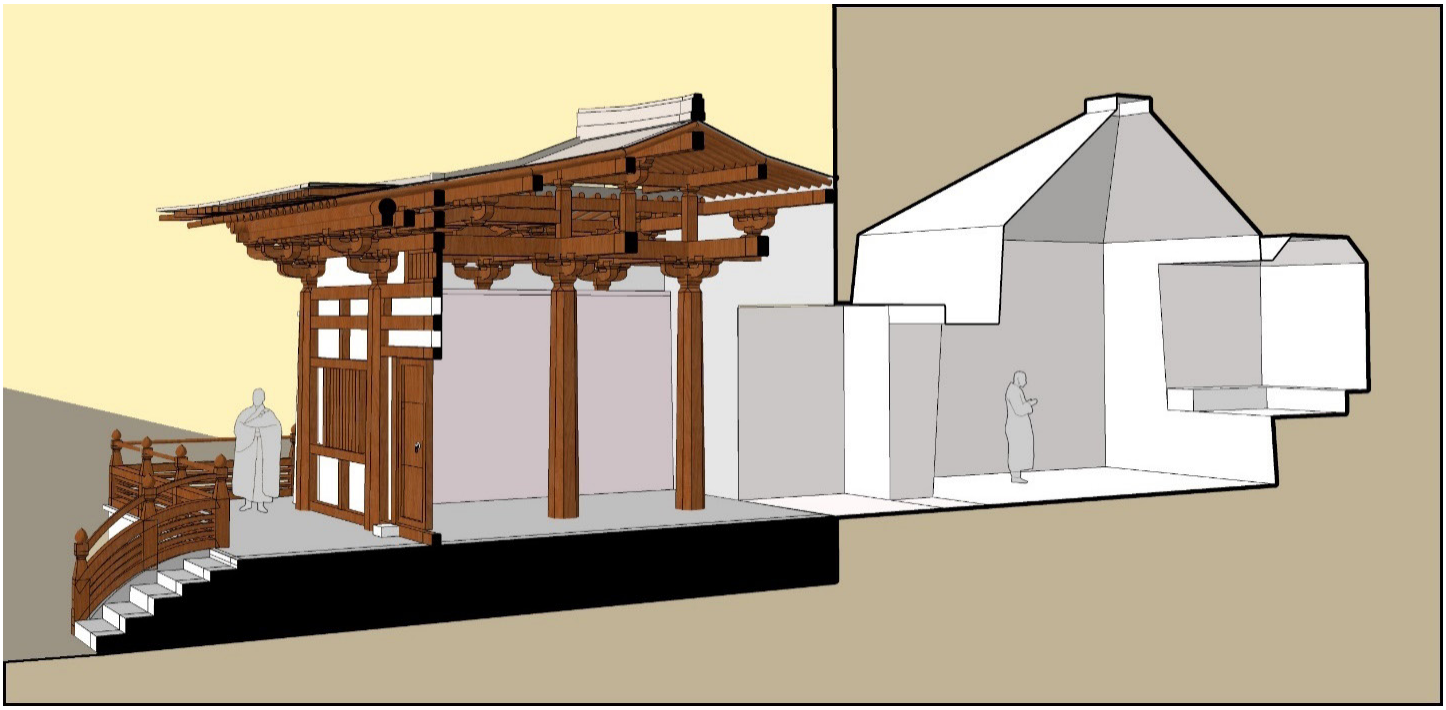

Figure 13.Sectional perspective of Mogao Cave 53 with the ante-hall reconstructed. Tenth century. Ante-hall reconstruction design by Xiao Mo; drawing by author.

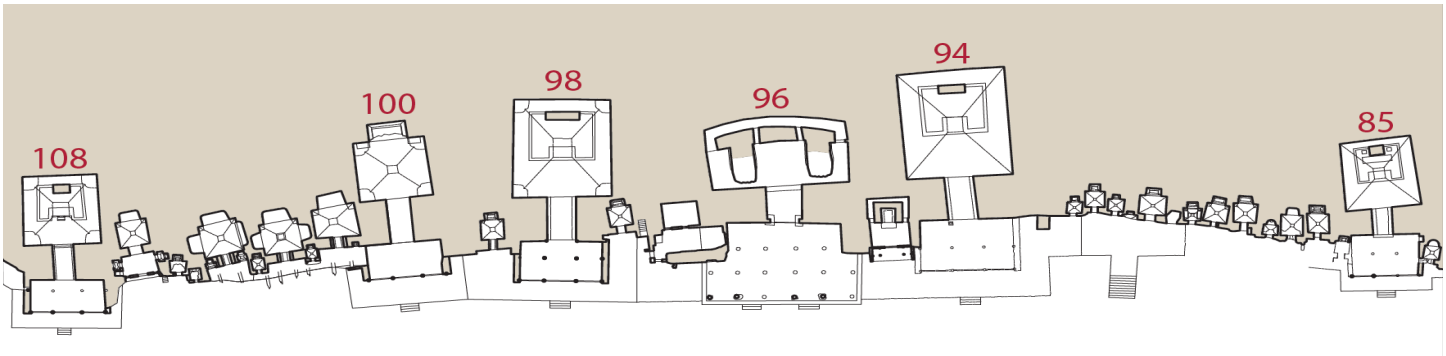

Figure 14. Plan drawing of the ground-level caves near Mogao Cave 96, numbered caves indicating ante-halls built during the Guiyijun period. Drawing by author.

Figure 15. Picture of Mount Sumeru, ink on paper, scroll, ca. 10th century. Found in Mogao Cave 17, in the collection of Bibliothèque nationale de France (Pelliot chinois 2012). Source gallica.bnf.fr / BnF.

ATHANOR XXXIX

FLORIDA STATE UNIVERSITY
DEPARTMENT OF ART HISTORY
COLLEGE OF FINE ARTS