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# *Towards a Chinese Christian University: The University of Nanking, 1912–31*

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ABSTRACT

The University of Nanking, established in 1910 by missionaries from the United States and built between 1912 and 1931, was one of the earliest Christian universities established in China. Its campus in Nanjing, in China's eastern Jiangsu province, featured a combination of Beaux-Arts plan, local Chinese architectural styles and modern building techniques that both responded and contributed to rapid changes in the city's socio-political context during the early twentieth century. Identifying and examining three trends in the planning and architectural design of the campus — westernisation, localisation and modernisation — this article argues that the university was actively involved in the transition of Nanjing from a regional urban centre of the Qing dynasty to the new capital of the Chinese republic (1912–49). The interaction of the three trends illuminates how a Chinese Christian university, as a new type of institution without parallels in traditional Chinese society, used western and Chinese theories and resources to produce modern educational space. The university's efforts to modernise in the face of Nanjing's then poor urban infrastructure and nascent building industry happened at various levels from infrastructure to tectonics, often achieved through the collective efforts of the western superintendent and Chinese workers and contractors. Influencing later attempts to modernise urban space and to develop a new architecture suitable for the new era in the country, the project represents a transitional moment in the architectural history of modern China when the cross-cultural exchange of knowledge between east Asia and the west brought new possibilities to Chinese buildings and cities.

The University of Nanking was established in the city of Nanjing, eastern China, in 1910 by Protestant missionaries from the United States.[1] Formed through the merger of three existing missionary educational institutions, it aimed to 'promote higher education in China under Christian influences and in harmony with the Word of God'.[2] Constructed mainly between 1912 and 1931, the university campus combined Beaux-Arts planning and Chinese architectural styles, achieved through the collaboration of western architects and superintendent and local Chinese workers. Although the university was dissolved in the 1950s, its campus and buildings were subsequently occupied by another university (Nanjing University) and are still in use today. The group of buildings was listed as a major historical and cultural site protected at the national level in 2006 and is now a popular scenic spot at the heart of the city.[3]

The University of Nanking was among a series of Christian higher educational institutions established in Asia by European and US missionaries in the late nineteenth and early twentieth centuries. Motivated by spiritual imperialism, western missionaries travelled in large numbers to Asia in this period and established not only churches, but also educational institutions to further their mission.[4] The combination of Christianity and

education helped the missionaries, who were challenged by anti-Christian movements, to preach in a less overt manner. At the same time, the expansion of Christian schools paralleled the country's effort to modernise its educational system by drawing on western models and experiences; Christian schools not only offered modern education to students, but also trained teachers for state-financed 'new schools'.[5] To increase their influence among the future leaders of China through tertiary education, missionaries established sixteen Christian universities in major cities including Beijing, Shanghai, Guangzhou and Nanjing. Chinese architectural styles were imitated and combined with western planning schemes at many Christian campuses, including West China Union University in Chengdu, Yenching University in Beijing and Lingnan University in Guangzhou.[6] Among them, the University of Nanking is notable for the way its planning and construction coincided with a transitional period for the power structure and urban space of Nanjing, as it transformed from a war-torn city of the Qing empire to the modern capital of the Republic of China. The construction of the university sheds light on the modernisation of Nanjing's educational space and building industry through the interaction of power and exchange of knowledge among the western missionaries and architects, the Chinese government at both national and municipal levels, local contractors and workers, and ordinary people.

Existing scholarship on Christian university architecture in China largely focuses on the dichotomy of westernisation and localisation. Westernisation, according to Jeffrey W. Cody and Lai Delin, lay primarily in the introduction of Beaux-Arts principles from the US to both campus planning and the overall formal composition of individual buildings.[7] The early introduction of Beaux-Arts to Christian universities including the University of Nanking, as shown by Dong Li and Seng Kuan, provided examples for reference and criticism in the later attempts of Chinese architects to combine Beaux-Arts principles and Chinese architecture to create a new national style in the 1930s and again in the 1950s.[8] Beyond Beaux-Arts, however, the case of the University of Nanking highlights the various competing trends, thoughts and values discussed and negotiated among the multiple western stakeholders of the university — the mission boards in the US, the university management group based in Nanjing, the US philanthropist donors and their favoured architects — and how these redefined the scope and content of westernisation in Christian universities. Discussion of localisation, in the works of Dong Li, Leng Tian and Peng Changxin, often focuses on the imitation of Chinese architectural styles and details as a response to anti-Christian sentiments.[9] However, the universities made various other attempts at localisation, actively involving themselves in the social reform and economic growth of China in an era of rapid change. As revealed in the architectural history of the University of Nanking, these localising attempts sometimes transformed the built form of the campus at a more fundamental level.

The dichotomy of westernisation and localisation, echoing the tension that Anthony King identified in typical colonial encounters between 'westernisation' and 'resistance in the politics of cultural nationalism', is useful when explaining the cross-cultural dialogue channelled through the architecture of Christian universities, and how this was shaped by negotiations between the western and Chinese stakeholders in China's semi- or quasi-colonial context.[10] However, this framework, focusing on the role of architectural form in making symbolic gestures, can lead to the neglect of a third issue — modernisation — as

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Fig. 1. *Map of Nanjing, 1907, annotated by the author (Archives of the United Board for Christian Higher Education in Asia, Yale Divinity Library)*

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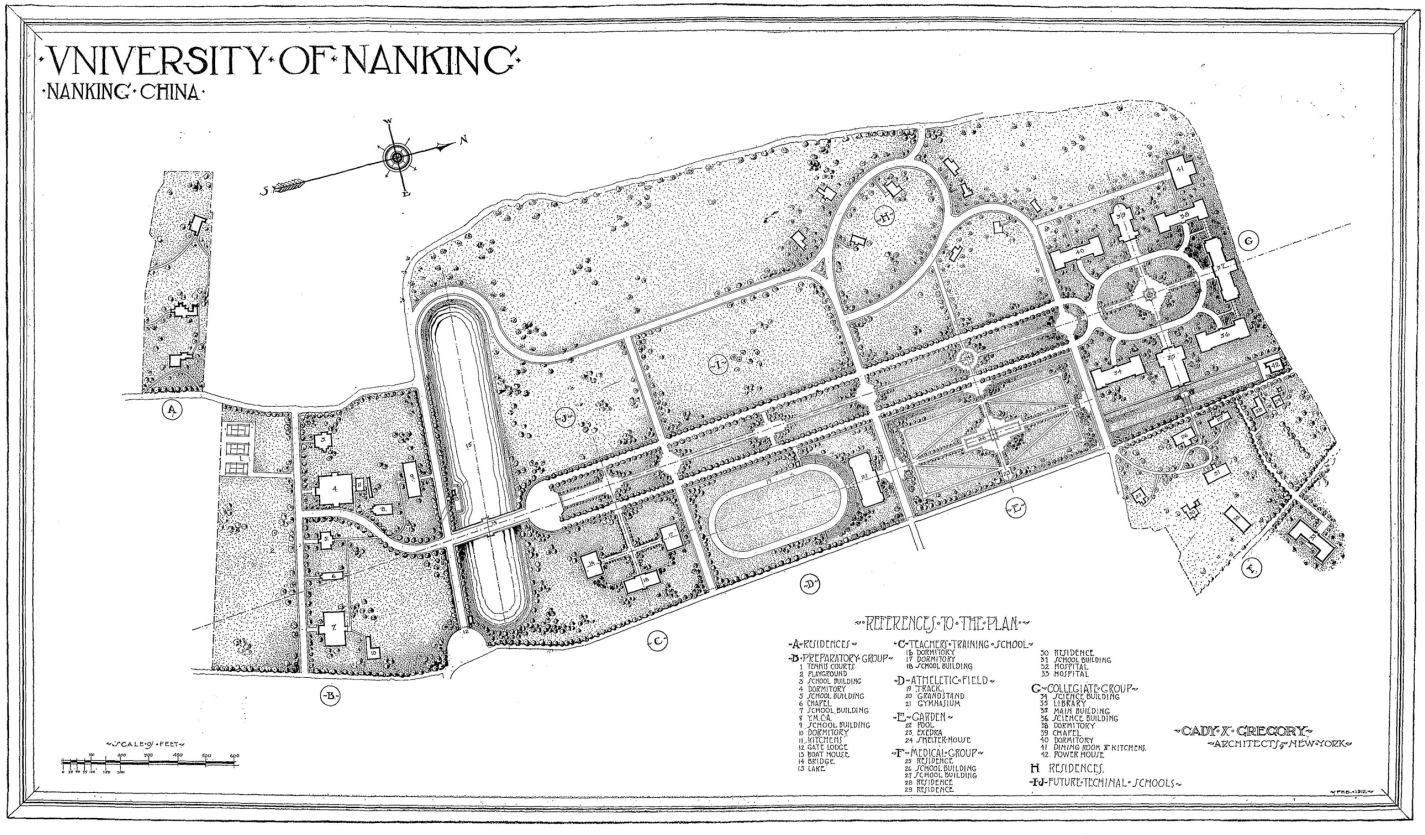


Fig. 2. *Cady & Gregory, proposed layout for the University of Nanking, 1912*
*(Archives of the United Board for Christian Higher Education in Asia, Yale Divinity Library)*

both a driving force and result of the construction of Christian campuses.[11] While some scholars point out that foreign architects brought modern materials and construction techniques to China through Christian universities, modernisation, as reflected in the University of Nanking, happened at various scales including the arrangement of function, the reconciliation of modern facilities with traditional exteriors, the improvement of building tectonics and the design of campus infrastructure. Rather than imposing western science on Chinese contexts, it was often achieved by a two-way exchange of knowledge, and sometimes production of knowledge, through the collective efforts of the western superintendent and Chinese workers. This article therefore investigates these three trends — westernisation, localisation and modernisation — and their interaction in the creation, construction and development of the university, in the process showing how it actively involved itself in the social transition of the city and the country.

## ESTABLISHMENT OF THE UNIVERSITY OF NANKING

With the Qing empire's defeat by the British in the first opium war (1839–42), China entered a period that became known as the 'Century of Humiliation' as it gradually turned into a semi- or quasi-colony under western imperialism. The Chinese government was maintained, but under a series of unequal treaties the country gradually lost wealth, land and power to determine political, economic and cultural issues on its own terms.[12] In response, China launched multiple reforms through the late nineteenth and early twentieth centuries, including the Self-Strengthening Movement in 1861 to promote technological modernisation of its heavy industry and military; the wide-ranging Hundred Days' Reform in 1898; and the 'New Policies' in the 1900s with the aim of modernising its political, economic and educational systems.[13] In the field of education, the government abandoned its traditional system centred on Confucian classics and established a western-style three-tier system.[14] State-financed schools with new subjects, curricula and pedagogy emerged alongside traditional private schools (*sishu*) and flourished in major cities throughout the country, especially after the termination of the old imperial examination (*keju*) system in 1905. The emergence of these modern schools drew inspiration from the development of Christian educational institutions in the late nineteenth century, which offered Chinese students instruction in English, mathematics and modern science.[15] Nanjing witnessed a boom in different types of modern educational institutions, among which its Christian schools were influential. Records show that by 1909 there were 7,507 students in the city's 100 modern schools, including Christian ones, with more than 90 per cent of teachers trained by mission schools.[16] The missionaries also set up schools for girls in Nanjing, which were among the earliest to provide equal education opportunities for women in imperial China. To help stimulate Christian education in the city, missionaries in Nanjing had pioneered in the establishment of Christian higher educational institutions. In 1888 the Methodist Episcopal Church established Nanking University, and in the same year the Disciples of Christ supported the foundation of Nanking Christian College near the Drum Tower, a traditional landmark in the city. Both institutions were located inside the city walls, at the foot of hills with lower population density (Fig. 1).

Despite the attractiveness of Christian educational institutions to those who were interested in modern education, they continued to be challenged by anti-Christian and

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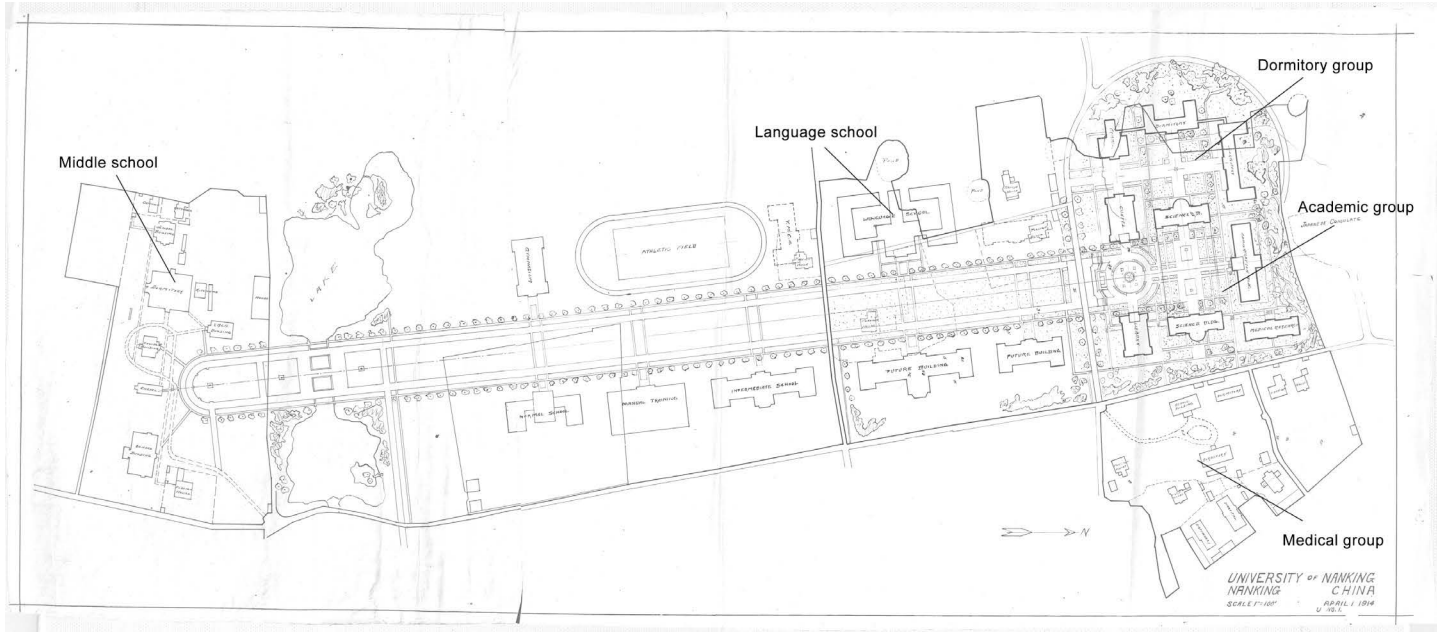


Fig. 3. *Perkins, Fellows & Hamilton, proposed layout for the University of Nanking, 1914, annotated by the author (Archives of the United Board for Christian Higher Education in Asia, Yale Divinity Library)*

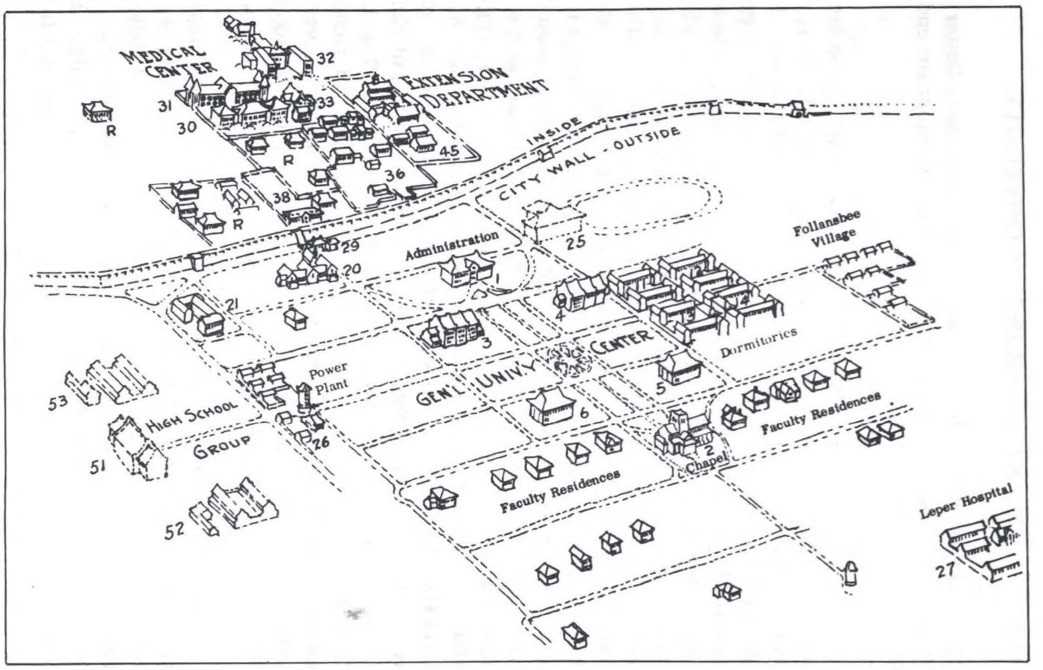


Fig. 4. *Perkins, Fellows & Hamilton, proposed layout for Shantung Christian University, undated (United Board for Christian Colleges in China Records, Columbia University)*

nationalist movements. In the Boxer Uprising of 1900, for example, Christian buildings were damaged and foreign missionaries attacked throughout the country, including Nanjing.[17] Competitors to Christian colleges emerged soon after: in 1903 a governmental higher educational institution — Sanjiang Normal College — was established a few miles to the east of Nanking University to train teachers for local public schools.[18] To unite against local threats and compete with governmental institutions, Christian colleges and schools began to amalgamate.[19] In 1906 Nanking Christian College merged with the Presbyterian boys' boarding school (established by the US Presbyterian Church in 1887), and in 1910 they were joined by the Methodist Nanking University. This marked the birth of the biggest Christian university in the city with an ambitious name — the University of Nanking. The university was governed by a board of trustees in New York, consisting of nine members from the three cooperating churches, and a board of managers was formed in Nanjing to execute the orders of the trustees and manage local affairs. Soon after the amalgamation, the missionaries began to plan a new campus.

## CAMPUS PLANNING: THE LOCALISATION OF A BEAUX-ARTS SCHEME

At its establishment the university owned 32 English acres of land in three locations belonging to the parent institutions. In April that year, the board of trustees authorised the purchase of a large tract of land between the two sites of the Methodist Nanking University

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and Nanking Christian College to connect them as a larger campus.[20] This was intended to be the main campus of the university. To their south-east, the Presbyterian school site was used to accommodate the university's affiliated primary school as a separate campus. In 1911 the board of trustees commissioned Cady & Gregory, an architecture firm based in New York, to draft an overall plan for the main campus.[21] The firm had been established in 1909 by Josiah Cleaveland Cady and William S. Gregory, both of them members of the US Presbyterian Church. In his previous practice, Cady had designed numerous churches as well as more than fifteen individual buildings on the campus of Yale University, including North Sheffield Hall (1873, demolished 1968), the Chittenden Memorial Library (1889), and several dormitories.[22] The architects lacked experience of planning a whole university campus, but their connections with the Presbyterian Church and Cady's work at Yale help to explain their involvement in the University of Nanking project.

The initial plan by Cady & Gregory, completed in January 1912, displayed typical Beaux-Arts planning principles in which monumentality was achieved through the symmetrical arrangement of buildings along axes, accompanied by large open spaces in the form of lawns or malls (Fig. 2).[23] The popularity of these principles in the US in the early twentieth century can be traced to the World's Columbian Exposition in Chicago in 1893, the site of which was a hugely impressive example of Beaux-Arts planning.[24] Its example was followed in the planning of US cities (known as the City Beautiful Movement) and university campuses. A perfect prototype for Beaux-Arts campuses at the time in the US was Thomas Jefferson's early nineteenth-century design for the University of Virginia, which featured a long mall flanked by groups of symmetrically disposed buildings and terminated by a visual anchor.[25] Columbia University by Charles McKim, the University of California, Berkeley, by John Galen Howard and the Rice Institute (later Rice University) by Cram, Goodhue & Ferguson represent the popularity of Beaux-Arts ideals among US campuses in the late nineteenth and early twentieth centuries.[26] Cady & Gregory's scheme for the University of Nanking exploited the linear site of the campus by arranging buildings along a main north–south axis. The axis began at the irregularly disposed existing buildings of the old Nanking University to the south (marked A and B on the plan shown in Fig. 2). It extended northwards as a mall, with the teacher training school (C), athletic field (D) and garden (E) on one side, and new residences (H) and slots for future technical schools (I and J) on the other. The mall terminated at the north with the collegiate group (G) as the visual anchor of the campus. This group included the main administration and academic buildings of the university, forming an open-ended quadrangle. To the east stood the buildings of the old Nanking Christian College, designated for the medical group of the university.

Before any building work had begun, however, Cady & Gregory lost their position as planners of the new campus. The reason remains unknown, but what can be confirmed is that, in April 1912, Ralph E. Diffendorfer from the board of trustees wrote to ask Ludlow & Peabody — another New York architecture firm — to draft a new plan for the university.[27] The budget was tight, as Diffendorfer asked if they could provide the service without charge as their contribution to overseas mission work. In their reply, the architects agreed to give their personal time for consultation free of charge, but insisted that the service fee of the draughtsmen be paid 'at the actual cost'.[28]

While the board of trustees hesitated over Ludlow & Peabody's offer, the situation became more complicated. A Chicago-based philanthropist, Nancy Fowler McCormick,

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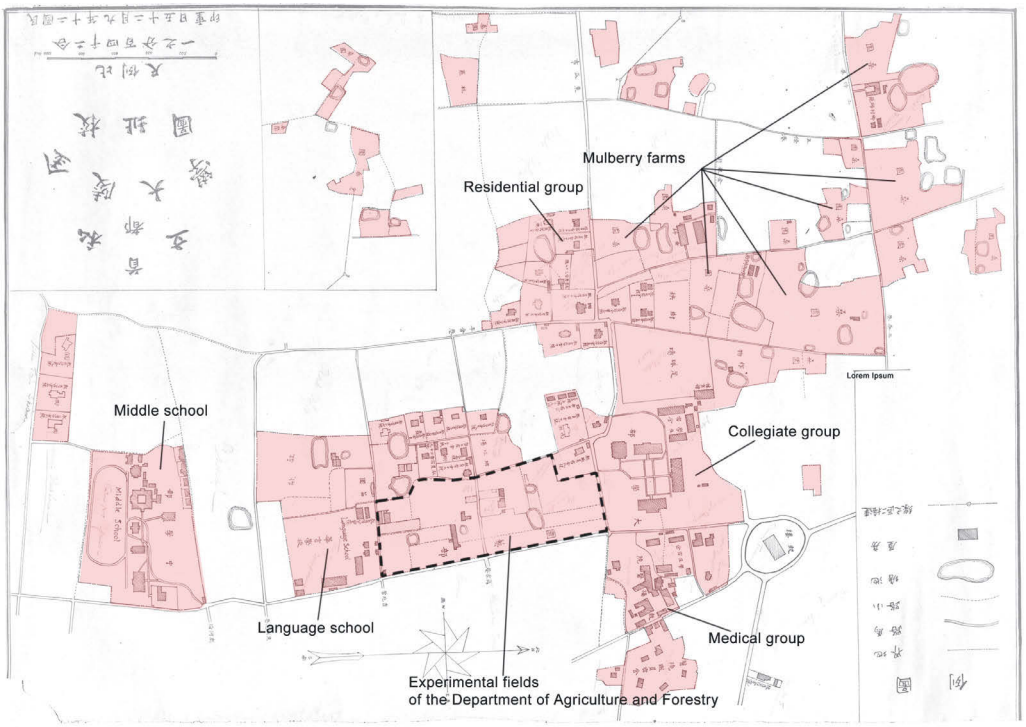


Fig. 5. *Map of the University of Nanking produced by the building and property committee, 1931, annotated by the author, with land owned by the university in red (Archives of the United Board for Christian Higher Education in Asia, Yale Divinity Library)*

made a donation to erect a large dormitory building on the campus, on the condition that it be designed by 'her own architect' — the Chicago firm Perkins, Fellows & Hamilton, formed through the partnership of Dwight H. Perkins, William K. Fellows and John L. Hamilton in 1911.[29] Perkins, educated at the Massachusetts Institute of Technology, was renowned for his expertise in designing educational buildings in Chicago, erecting more than forty schools while working for the Chicago Board of Education from 1905 to 1910.[30] McCormick's vast wealth and her willingness to make further donations earned her power to influence the decisions of the university's trustees, and this fostered the growing ambition of Perkins, Fellows & Hamilton to acquire the commission to plan the whole campus in place of Ludlow & Peabody. In May 1912, McCormick donated $1,000 to the university as service fee for the work of Perkins, Fellows & Hamilton, and in the same month the firm presented the trustees with a preliminary planning scheme for the collegiate group .[31] In June, the board advised Ludlow & Peabody that they 'had considerable discussion over the matter of an architect and comprehensive scheme of buildings' and would like to 'let the matter remain open until we see what is to come out of Mrs. McCormick's proposition'.[32] In 1913, fully sponsored by McCormick, Fellows was invited to Nanjing to study the site and prepare an overall plan.[33]

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Fig. 6. *University of Nanking, collegiate group and agricultural gardens, photograph of* c. *1930 (Archives of the United Board for Christian Higher Education in Asia, Yale Divinity Library)*

Perkins, Fellows & Hamilton had a different view on Beaux-Arts planning to Cady & Gregory. In a book later published by the firm in 1925, they wrote that 'the American idea of distinctly separated buildings is wasteful of space, expensive in construction and adds materially to the cost of operation and maintenance'. Instead they favoured British ideas of grouping university buildings in quadrangles, exemplified by Oxford and Cambridge: 'Would it not be better to develop these large institutions, these universities, as a series of colleges like Oxford? One could imagine each department with its own quadrangle and each quadrangle associated with its related department and to the administration and facilities used in common.'[34] This vision was probably influenced by Perkins's previous experience in designing Hitchcock Hall (1901), a dormitory at the University of Chicago, the campus of which was arranged into Gothic quadrangles. During the design process, the client asked Perkins to imitate the architectural form of the colleges at Oxford University, and in 1900 sent him to Europe to study Gothic architecture.[35]

However, the plan that Perkins, Fellows & Hamilton drafted in 1914 for the campus of the University of Nanking largely followed the previous scheme by Cady & Gregory (Fig. 3). Indeed, it had even more apparent Beaux-Arts features including symmetry, axiality and distinctly separated buildings rather than quadrangles. The university mall, as a dominating part of the campus, was maintained and extended further south, with the language school and an athletic field on the west and five future buildings on the east. The collegiate group to the north comprised two open-ended courts forming the academic group (east) and the dormitory group (west). The only building on the campus which may be called a 'quadrangle' was for the language school, where western missionaries were trained to speak Chinese. At the same time as working for the University of Nanking,

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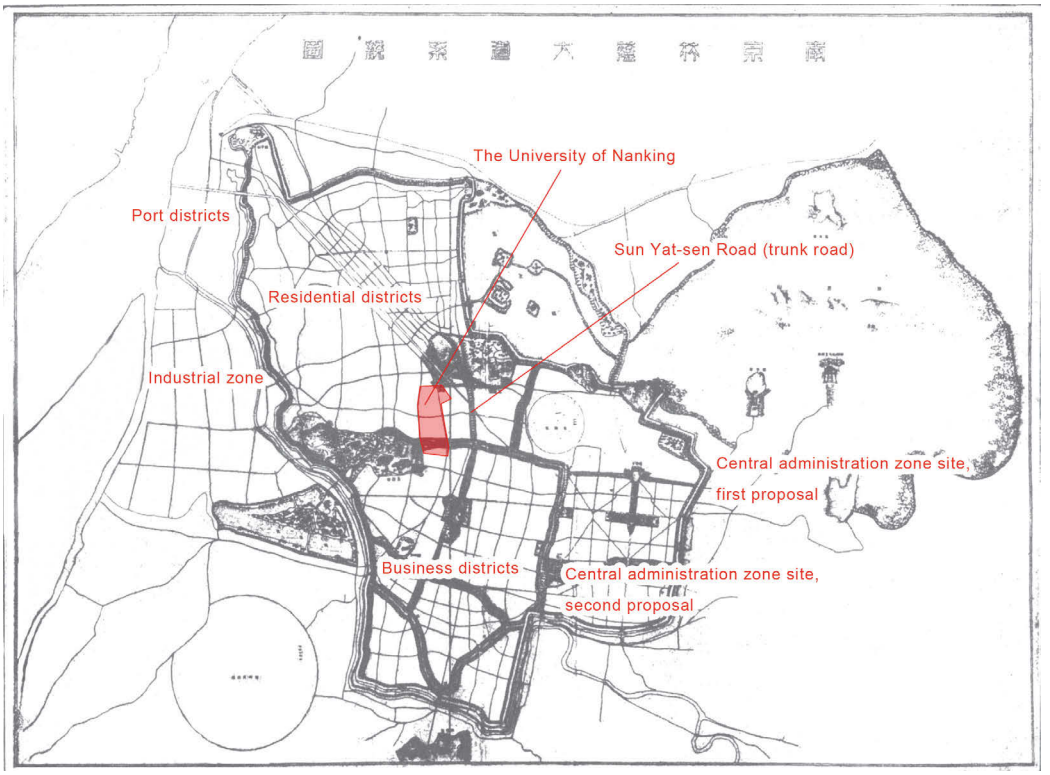


Fig. 7. *The proposed road system and zoning of the Nanjing Capital City Plan, 1929, annotated by the author, from Guodu Sheji Jishu Zhuanyuan Banshichu,* Shoudu Jihua, *2006*

Perkins, Fellows & Hamilton was involved in the planning of another Christian university in eastern China — Shantung Christian University in Jinan, Shandong Province (Fig. 4).[36] In this case on a rectangular site, the proposed plan was again distinctly Beaux-Arts, with a central university mall connecting the chapel and the administration building, and four academic buildings symmetrically disposed either side of the mall.

Although Perkins, Fellows & Hamilton did not specify why they embraced Beaux-Arts planning at these two campuses, the reasons are not hard to infer. Aside from the popularity of Beaux-Arts education in US and European universities, from which most architects of China's Christian universities graduated, Beaux-Arts plans were potentially more appealing than other schemes in fundraising campaigns — a vital issue. Funding for US universities in the early twentieth century, including the Christian universities in China, came largely from donations of US industrialists and philanthropists who enthusiastically gave to educational causes in exchange for personal memorials or memorial buildings.[37] Beaux-Arts plans were often more attractive to these donors as the grand schemes depicted a potentially prosperous institution worthy of investment and elevated the overall sense of monumentality they desired. Second, according to some western architects, Beaux-Arts planning principles coincided with traditional Chinese ones — particularly those

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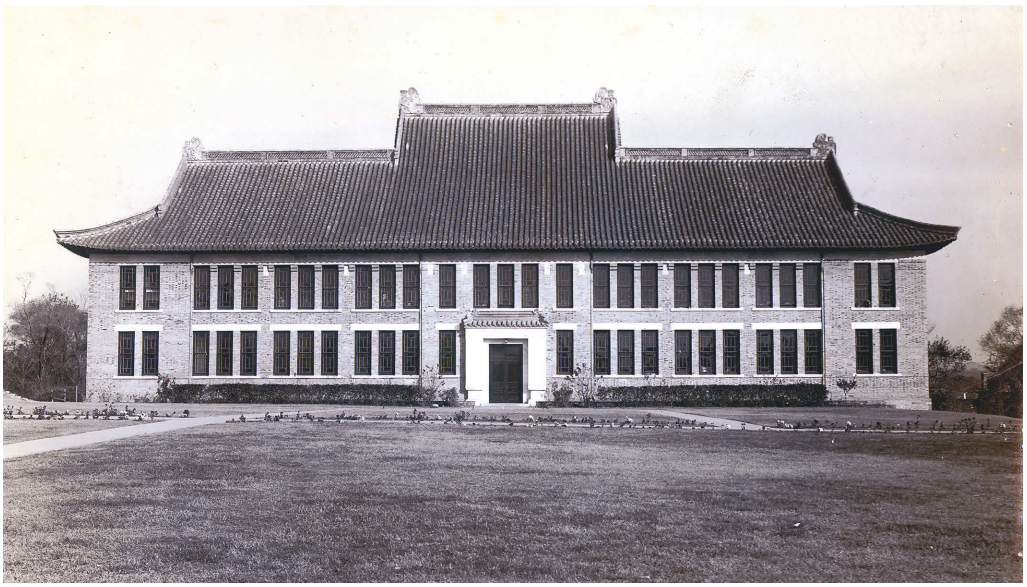

Fig. 8. *University of Nanking, Science Building, front façade, Perkins, Fellows & Hamilton, 1917, photograph of c. 1930 (Archives of the United Board for Christian Higher Education in Asia, Yale Divinity Library)*

represented by the planning of the Forbidden City — in terms of their similar emphasis on axiality and symmetry.[38] In this way, Beaux-Arts planning represented a balance of westernisation and localisation, and might more easily blend a Christian campus into the Chinese context. In fact, more than half of China's Christian universities completed in the early twentieth century adopted Beaux-Arts schemes. For example, West China Union University in Chengdu, Sichuan (designed by Fred Rowntree), Lingnan University in Guangzhou, Guangdong (James Edmunds Jr), and Yenching University in Beijing (Henry K. Murphy) all featured symmetrical arrangements of buildings, large open spaces and the creation of visual climaxes on major axes.[39]

At the University of Nanjing, however, the Beaux-Arts plan was largely challenged and compromised during the construction process. This was associated with the political and cultural conflict between the missionaries and the local Chinese regarding land issues, as well as the university's intention to involve itself in the modernisation of agricultural education in Nanjing and China. The first challenge emerged when the missionaries tried to purchase the 'Western Hill' property, a tract of grave lands in the intended site. Historical records diverge on the process of the purchase. A historical sketch of the University of Nanking, edited by the Chinese scholar Wang Dezi, suggests that 'Western Hill' was an ancient battlefield where soldiers were buried, thereafter used as an ownerless cemetery by nearby residents.[40] This source suggests that the missionaries purchased this land (unclear from whom) at a low price and cleared up the graves for construction of the campus. Another source holds that the grave lands were owned by local residents and that the missionaries occupied them illegally and desecrated the graves.[41] Both

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Fig. 9. *University of Nanking, Science Building, rear façade, Perkins, Fellows & Hamilton, 1917, photograph of c. 1930 (Archives of the United Board for Christian Higher Education in Asia, Yale Divinity Library)*

sources mention that the issue of ownership and the removal of graves caused dispute between the missionaries and the local people.[42] The missionaries were sued and the case remained unsettled for years until the missionaries won by bribing Chinese officials and gaining support from local gentry.[43] Similar conflict over land issues happened between missionaries and local landowners in other cities. The 'non-cooperation' of local villagers over the purchase of land for West China Union University in Chengdu was eventually resolved through the help of local government and gentry who intended to take advantage of western involvement to modernise local urban space.[44] These cases reveal divergent attitudes among the Chinese towards the foreigners as participants in the urbanisation of Chinese cities in the early twentieth century.[45]

In time, the construction of the University of Nanking on the 'Western Hill' site had the benefit of dispelling superstition among the local community, as the once gloomy grave lands were turned into a beautiful campus with green open space and well-constructed, light-filled buildings. In addition to this tract of land, the university purchased an adjacent property called Yu Kung Kuan (also spelt Yu Gongguan, literally 'property of the Yu family'), which originally belonged to a Qing dynasty aristocrat but was believed by local people to be a 'haunted' place where nobody would get close.[46] Its transformation into the language school of the university, with bright classrooms filled with students, similarly helped to exorcise space and minds. The conversion of these sites contributed to efforts in this period, mainly launched by Chinese government officials and elites, to use the imported 'religion' to oppress what was perceived as backwards superstition inherited from the country's past.[47]

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Fig. 10. *Ginling College, Nanjing, main building, front façade, Henry K. Murphy, 1923, photograph of c. 1930 (Archives of the United Board for Christian Higher Education in Asia, Yale Divinity Library)*

While the issue of land purchase was solved if not forgotten, another challenge emerged that had a significant impact on the construction of the campus. In 1911, the year after the university's establishment, the Qing dynasty was overthrown, and in 1912 the Republic of China was established. In addition to the devastating impacts of war during the revolution and subsequent warlordism, the city of Nanjing in 1913 suffered from serious floods which made hundreds of thousands of people homeless. Joseph Bailie, who was then teaching mathematics at the University of Nanking but who was also familiar with agriculture and forestry, cooperated with the local government and helped the victims by engaging them in afforestation and colonisation of nearby mountains.[48] Their successful efforts aroused the interest of Chinese government officials at various levels in the value of modern agriculture and forestry for the struggling Chinese republic. Noticing the growing local demand for agricultural education, the University of Nanking established its Department of Agriculture and Forestry in 1914 with funding and other forms of support from both central and local governments.[49] This attracted the attention of enthusiastic governors of nearby provinces including Anhui, Shandong and Guizhou, and scholarships were established to encourage students from these provinces to study agriculture and forestry at the university.[50] The department taught courses and conducted experiments with the aim of improving China's crop farming and fruit growing, as well as mulberry and silk worm culture.[51] The rapid growth of the department, which became a college in 1916, led to an increasing demand for land to facilitate practical work for the students and create experimental fields for research.

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Fig. 11. *St John's University, Shanghai, Science Building, Atkinson & Dallas, 1899, photograph of* c. *1930 (Archives of the United Board for Christian Higher Education in Asia, Yale Divinity Library)*

A committee under the board of managers of the University of Nanking was formed to apply for land from the local government and a proposal made to organise a Chinese board of trustees of the new College of Agriculture and Forestry to help secure more.[52] These attempts were not successful, and to meet its urgent demand for land the college began to rent properties adjacent to the campus as temporary mulberry farms, including what the university called the Ying Property, a large tract of 21 English acres to the north-west.[53] At the same time the college turned to lands that were already purchased by the university but not currently in use, in particular the large vacant area in the proposed university mall. According to the university president's report in 1918, all campus land not occupied by buildings was by then used for experimental work in agriculture and forestry, including the mall.[54]

The temporary occupation became permanent during the construction of the campus. From the 1910s to the 1930s, the focus of construction was on the collegiate group and the medical group; there was no attempt to retrieve the experimental fields for new buildings or the mall.[55] As a result, the 1931 map of the campus shows a significant departure from the original plan (Fig. 5). The campus expanded to the north-west, with large areas of land — originally rented as mulberry farms — purchased by the university. The collegiate group was built as planned, indicating the proposed north–south axis. However, the mall was replaced by loosely disposed buildings and open spaces. The Chinese characters on the map indicate that this area was for Yuan Yi Bu, which may refer to the Department of Horticulture, or more likely the agricultural gardens managed by the College of

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Fig. 12. *University of Nanking, women's dormitory, front façade, Perkins, Fellows & Hamilton, 1919, photograph of c. 1930 (Archives of the United Board for Christian Higher Education in Asia, Yale Divinity Library)*

Agriculture and Forestry in which nursery stock, foreign vegetables, fruits, flowers and seeds were produced and sold by students.[56] An early photograph including this area shows it was divided into multiple plots growing various kinds of plants (Fig. 6). This use of the campus drastically compromised the original ambitions for a comprehensive Beaux-Arts atmosphere.

The planning and construction of the campus of the University of Nanking thus demonstrate how the tendency of westernisation, exemplified by the vision of a grand Beaux-Arts plan, was undermined as the university strove to localise — responding and adapting to the shifting social and economic contexts of Nanjing. During the period of construction in the 1920s and 1930s, the city of Nanjing experienced radical political changes. With the defeat of the warlords by the Chinese Nationalist Party and the foundation of the Nationalist government in 1927, Nanjing was reaffirmed as the capital of the Chinese republic.[57] The University of Nanking experienced a new wave of the anti-Christian movement urging for Chinese control of Christian universities in order to 'retrieve educational rights' from the foreign missionaries.[58] Under such circumstances, the university soon registered itself under the new Nationalist government in 1928, removed compulsory religious courses and activities from the curriculum, and appointed a Chinese faculty member as its president for the first time to alleviate local hostility. As the Nationalist government began to address the city's social problems and to modernise its infrastructure, the university also eagerly involved itself in this process. It cooperated with the government to contribute to social welfare, including establishing training

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schools for textile mill workers and cooperatives for rickshaw pullers, and working with the newly formed Education Cinema Association (Jiaoyu Dianying Xiehui) to produce patriotic films.[59]

Nonetheless, the architectural ideals that underpinned the university campus were echoed in the new urban planning of Nanjing. In 1929 a Capital City Plan was published by the Nationalist government, having been drawn up by Chinese planners and architects including Lü Yanzhi and American advisers including Murphy (the architect of Yenching University). Employing a combination of planning ideas, the city was to be gridded by a hierarchical road system and divided into distinct zones including a central administration area adjacent to the Ming Imperial Palace and main business districts in the south section of the city (Fig. 7).[60] Within each zone, Beaux-Arts planning was adopted to create a sense of order and monumentality, while Chinese-style buildings — topped by traditional curved roofs — were to be erected to help forge a national identity.[61] Having transplanted a Beaux-Arts scheme to Nanjing, the university stood harmoniously in the new city plan that it helped to bring about. At the same time, however, it consciously sought ways to fit in and be part of China's rapid nation-building.

## ARCHITECTURAL DESIGN: CHINESE ARCHITECTURAL IDENTITY AND MODERNITY

The architecture of the University of Nanking was shaped by two major intentions on the part of the missionaries and the architects: to make the university both 'Chinese' in appearance, blending the campus into the city, and 'modern' in meeting functional requirements. After Fellows conducted his site tour in 1914, the architects drafted a report expressing their preliminary thoughts on the issue of style. They argued that 'the foreign style [in China] has so far developed nothing worthy of imitation [...] Transplanted Gothic, no matter how well it may be executed, looks out of place.'[62] Instead they acknowledged that 'China is the only country in the world that has any claim to a native style of architecture [...] developed through countless centuries', and proposed to adopt an architecture that would 'hold [its] place in the Chinese landscape in a manner not offensive'.[63] Meanwhile, the issue of modernity arose in the design and construction of the university buildings, as modern engineering knowledge was used to reconcile the Chinese appearance and the spatial and structural requirements of the buildings. This was achieved through the cooperation of western experts and local Chinese workers. However, the architects could not break free from their western architectural knowledge and education and avoid foreign elements when designing for the university. Limited funding also seriously reshaped it in the process of construction. The completed buildings at the University of Nanking thus manifest how the pursuit of localisation and the intention to modernise were intertwined and modified by a latent trend of westernisation and a range of practical issues. This section will elaborate on this by examining in detail the Science Building (1917) and the Administration Building (1920), both part of the main collegiate group.

The Science Building (Fig. 8) exemplified a combination of Beaux-Arts architectural principles — symmetry, centralised form and monumentality — and Chinese elements that was seen throughout the campus of the University of Nanking and indeed subsequent Christian university campuses in China.[64] The building was two storeys in height and a simple rectangle in plan, with classrooms arranged along a central corridor.

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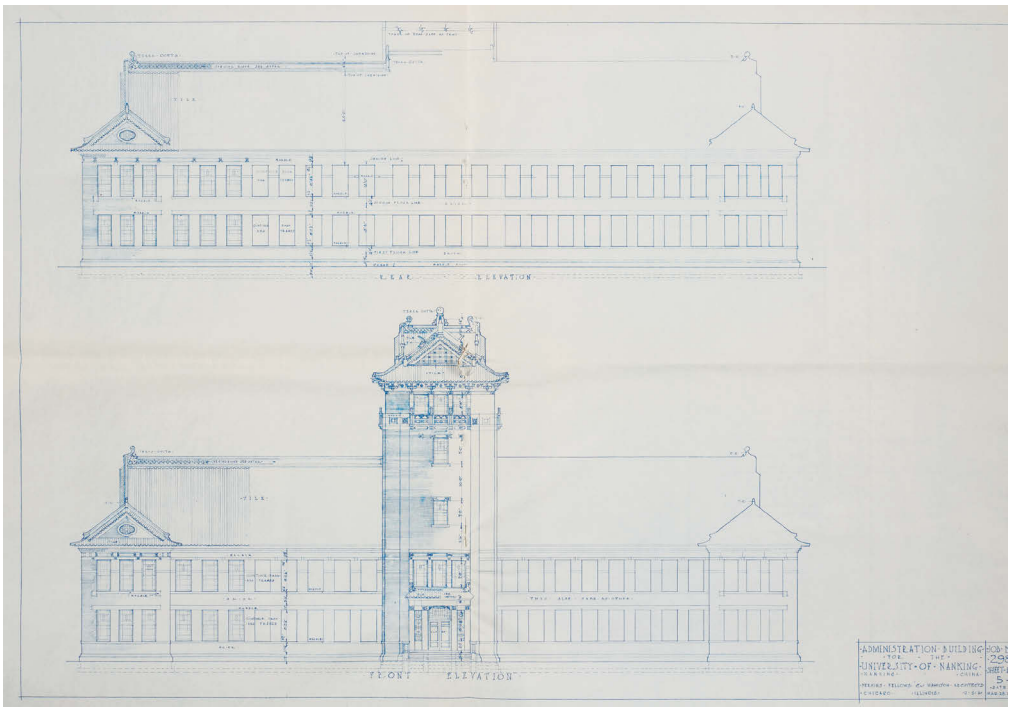


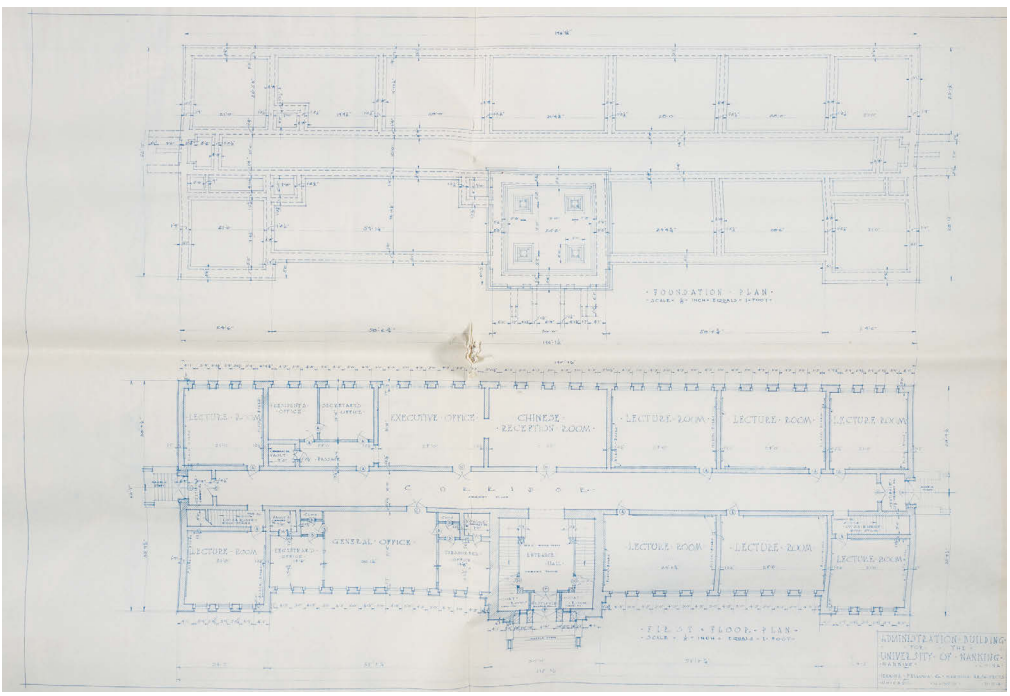


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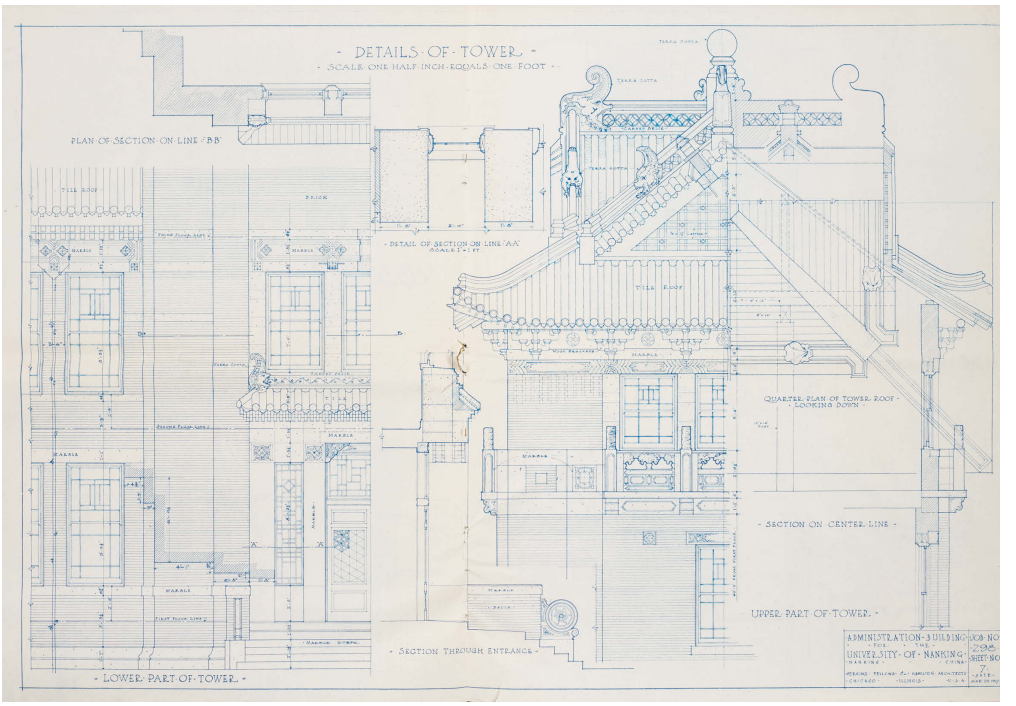


Figs 13–15. *Perkins, Fellows & Hamilton, design drawings for the Administration Building, University of Nanking, 1917 (Archives of the United Board for Christian Higher Education in Asia, Yale Divinity Library)*

Ornamentation was applied to the main elevation to emphasise the central entrance — in particular additional eaves and the brick and plaster finishing. The central section of the building accommodated large organic chemistry laboratories, which extruded outwards and upwards by one storey at the rear (Fig. 9). The building was topped by a Chinese *xieshan* (hip-and-gable) roof featuring mildly curved eaves, typical of palace architecture in north China. The architects claimed that northern Chinese palace architecture, with smaller projection of eaves and simpler bracket structures than southern ones, would cost less in construction and upkeep.[65] Their Beaux-Arts representation of a local style was further developed in later Christian university campuses, including the main building of the nearby Ginling College for Girls by Murphy (Fig. 10).[66] Such design, according to the Chinese architect and architectural historian Liang Sicheng, was satisfactory in reflecting the spirit of Chinese architecture, whereas the practice at earlier Christian campuses — for example, St John's University in Shanghai (Fig. 11) — was 'merely putting Chinese roof on western walls'.[67] Inspired by the consonance of Chinese palace architecture and the Beaux-Arts in terms of symmetry and monumentality, as well as the flexibility of Beaux-Arts as a design method, Chinese architects trained in the US further explored the combination to create a new 'national style' for Chinese architecture in the 1930s.[68] In the Capital City Plan of Nanjing, examples included the Ministry of Railways building

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complex of 1929 and the Party History Hall of 1935.[69] For Chinese architects and scholars such as Liang Sicheng, the University of Nanking was a pioneer in the revival of China's architectural heritage in the modern era.[70]

Although the pursuit of Chinese architectural identity at the university was often compromised by practical issues such as cost, decisions aimed at reducing cost sometimes assisted the localisation of architecture. For building materials the architects suggested the purchase of clay bricks from local kilns in Nanjing, and to reduce the cost the university considered producing bricks on campus.[71] At the point when the Science Building was under construction, the demolition of the city wall of Nanjing had commenced and the university managed to purchase around 100,000 of its bricks at low cost to use in addition to ordinary bricks.[72] These bricks from the city wall were used not only in the Science Building, but also in later construction on the campus, establishing a subtle connection between the university buildings and the history of the city which — although it might have been unintentional and unforeseen by the architects — enhanced the localisation of the buildings.

Other practical demands tied to the aim of modernising the university challenged the imitation of Chinese architectural styles. To provide heating and hot water to the students and staff, stoves were installed in the dormitory and academic buildings, with their chimneys extruding from the Chinese roof. It concerned the university authorities that this damaged the Chinese appearance of the buildings. In their later design for the women's dormitory, the architects improved the section design by leading all the pipes of the different stoves to the flues embedded in each of the two *wenshou* (dragon-shaped zoomorphic ornaments) on the roof's ridge (Fig. 12).[73] For the missionaries, this was a successful example of a university building that was both modern and Chinese.

The Administration Building provides another vivid example of how the aim of modernisation shaped the design and construction of the university. In January 1916, John L. Severance and his sister Mrs Dudley P. Allen each donated $25,000 to erect this building in the collegiate group ($35,000 for construction, $15,000 for upkeep), and the architectural drawings were finished in March 1917 (Figs 13–15).[74] The design featured a central tower attached to a two-storey horizontal block, topped by a Chinese hip-and-gable roof decorated with details from northern Chinese palace architecture. However, the overall composition — a central tower attached to a horizontal block — was rare in Chinese architecture, though quite common in educational buildings in the UK and the US.[75] Negotiation over the removal of the tower from the design emerged in response to insufficient funds resulting from the low rate of exchange between the US and Chinese currencies, as well as the roaring inflation rate in the US in the aftermath of the first world war.[76] Although Severance and his sister each added $5,000 to the construction fund, this was deemed not enough. John E. Williams, a member of the university's board of managers, wrote to the architects and asked them to eliminate the tower to reduce cost.[77] In their reply, the architects expressed disappointment, arguing that there would not be any great amount saved by doing so.[78] Meanwhile, Williams also wrote to the university superintendent, Alexander G. Small, to evaluate the omission of the tower.

It was the intention to modernise the campus that helped save the tower. In his reply, Small expressed an ambiguous attitude towards its design. On the one hand, he criticised it from the perspective of aesthetics, arguing that 'the tower is a distinct foreign introduction

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Fig. 16. *University of Nanking, Administration Building, front façade, Perkins, Fellows & Hamilton, 1920, photograph of* c. *1930 (Archives of the United Board for Christian Higher Education in Asia, Yale Divinity Library)*

and any scheme you work with the tower will not cover up that foreign element'.[79] On the other, he insisted on keeping this element of the building for its practical value, claiming that it would be the perfect place — due to its height and location — to install a water tank for the university. At the time the university was constructed, there was no running water system in the city of Nanjing.[80] According to Small, 'an institution the size of this ought to have some place where water can be stored in sufficient quantities under sufficient pressure to put out fires which might otherwise mean a serious handicap to the University'.[81] To save the tower, Small tried to reduce the cost of the building through other ways, including changing its floor material from timber to concrete. While the construction cost was the same, Small argued that the concrete floor would not need to be annually repaired and would thus save on maintenance costs.[82] As a result, Severance agreed to the diversion of the $15,000 donated for upkeep to cover the construction cost and the tower was built as proposed (Fig. 16).

Modernisation on the campus also happened at the level of architectural tectonics. During the construction of the university, western experts and Chinese workers combined traditional Chinese techniques and modern engineering knowledge to meet the functional

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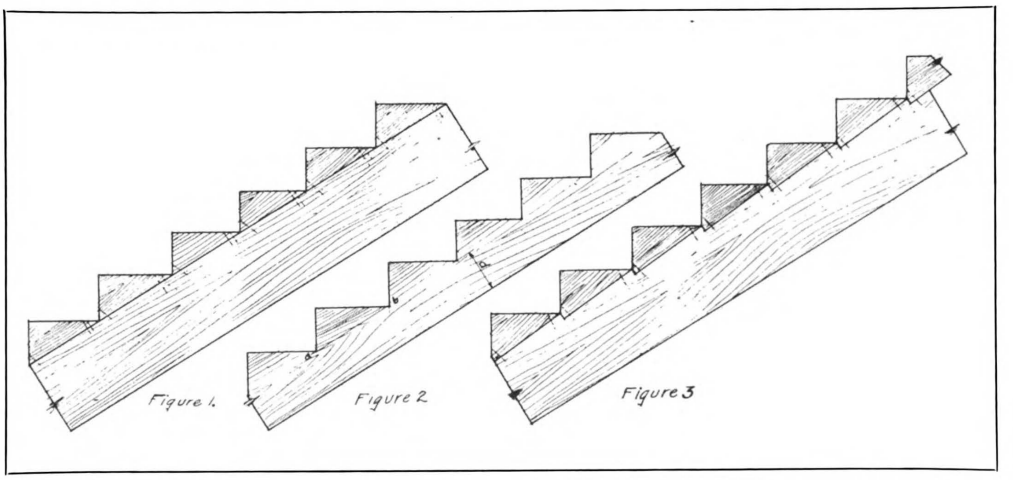


Fig. 17. *Adaptation of traditional stairway to modern requirements, from Alexander G. Small, 'Construction Problems of a Superintendent in China'*, American Architect, *1928*

requirements of the buildings. As the superintendent, Small mainly cooperated with a Chinese contractor called Chen Ming Ji Ying Zao Chang which had been established in 1897 by the Chinese carpenter Chen Lieming, nicknamed Chen Ah Ming by Small.[83] With limited previous construction experience, the foremen 'could read only the simplest of blue-prints' and had limited knowledge of mechanics.[84] Almost no one on the contractor's staff could speak English either. Small thus learned Chinese to communicate with local workers. It was recorded that, when the workers encountered technical problems, Small would use his engineering knowledge to improve existing techniques or to work out new solutions.[85] For example, Small considered that the traditional Chinese technique of toenailing the tread supports on top of stair joists was not reliable enough for large university buildings, as the tread support might pull the nails and slip along the joist when multiple students step on it ('Figure 1' in Fig. 17). An alternative approach was to cut the joist into the shape indicated in 'Figure 2', yet the joist in this case might be too thin to carry the load safely. Small came up with a new solution — to cut notches on the joist to hold the tread supports ('Figure 3' in Fig. 17), which combined the advantages of the previous two schemes. Small also worked out solutions to make the heavy teakwood doors of the university chapel stably hinged, through careful calculation of forces and loads.

The Chinese contractors not only carried out Small's solutions, but were actively involved in solving construction problems with acquired engineering knowledge in cooperation with him. In most buildings, the architects proposed to use a timber truss to support the roof while maintaining a large clear span for the classrooms below. However, due to the heavy load of the Chinese tiles, no conventional joints known to the workers or to Small would be strong enough to connect the rafter and the tie beam without collapsing. To solve the problem, Charles T. Gee, a Chinese engineer working for the contractor, collaborated with Small and invented a strengthened truss joint based on mechanical knowledge (Fig. 18).[86] In usual heel joints, bolts are placed perpendicular to

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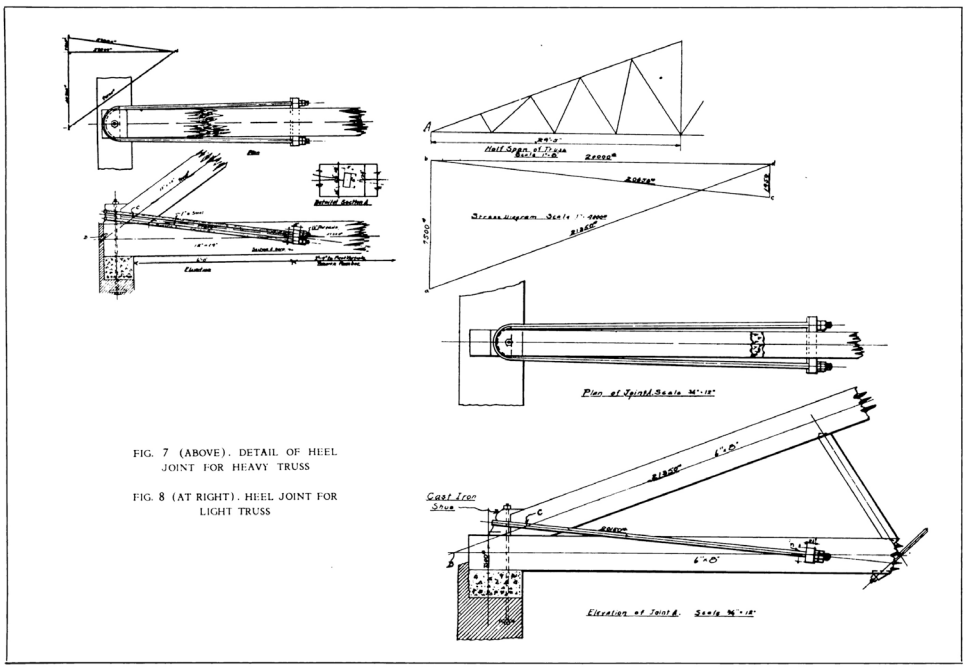


Fig. 18. *Details of heel joints, from Alexander G. Small, 'Construction Problems of a Superintendent in China'*, American Architect, *1928*

the rafter member with a steel plate over the end of it, and the steel plate is notched back on the top of the tie beam. Gee and Small creatively cut a hole through the middle of the tie beam and placed a steel bearing plate in the hole. Two U-bolts were used to oppose the stress in the rafter member, transferring it to the iron castings around which they pass. In this way, the only stress acting between the rafter and the tie beam at their contact point was the vertical component of the stress in the rafter, with lower risk of collapsing.[87] This design ensured the stability of the roof truss to support the heavy Chinese roof, below which large classrooms could be free of internal columns.

Under the direction of Small, the workers of Chen Ah Ming completed the Science Building, the Administration Building, the university chapel and several dormitories. Local competitors of Chen Ah Ming soon emerged, including Ing Mei Chee, Chow and Wang.[88] According to Small, these contractors shared the same blacksmiths and carpenters, while the painters often interchanged freely.[89] Therefore, every time a new building was to be erected, Small would compare their quotes and select the one with the lowest cost. The boom of building contractors in Nanjing and nearby areas (particularly Shanghai) in the early twentieth century exemplifies the rapid modernisation of China's building industry to meet the increasing building demand of western and Chinese clients.[90] The Chinese workers, through constructing the University of Nanking, gained experience of modern construction and engineering knowledge. This prepared them for the construction of later building projects, especially when the Capital City Plan was carried out in the 1930s.[91]

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## CONCLUSION

This article has shown how the design and construction of the University of Nanking were shaped by the three intertwining trends of westernisation (with the purpose of Christianising China), localisation (aimed at surviving the fierce conflict between western missionaries and the local people) and modernisation (meeting western expectations and growing local and national demands). Examining the negotiations involved and the interaction of these three trends has illuminated how a Christian university in China, as a new type of institution, prioritised certain issues over others and manipulated the available resources in order to establish itself and develop in the context of the shifting local and global relations of the early twentieth century.

During the construction of the campus, westernisation — represented by the Beaux-Arts plan — was compromised in the process of localisation. The replacement of the university mall by experimental fields exemplified how western planning ideals gave way to local imperatives, especially urgent in a period of political uncertainty and cultural conflict. The satisfaction of modern functional requirements, exemplified in the negotiation of the tower of the Administration Building, was prioritised over architectural aesthetics to ensure the smooth operation of the university. However, not all interaction among the three trends led to compromise. The hybrid campus, with Chinese-style buildings disposed on a US Beaux-Arts plan, suggested the possibility of the peaceful coexistence of western and local ideas and skills, influencing the urban plan of Nanjing and other cities. The efforts to achieve a Chinese appearance while fulfilling functional requirements, through the two-way exchange and production of knowledge between western and local people, accelerated the modernisation of traditional techniques and the building industry of Nanjing and China in the early twentieth century, with social and economic impacts as well as influence on the search for a national architectural style. The construction of the University of Nanking thus illuminates a transitional moment in the architectural history of modern China when the intersecting trends of westernisation, localisation and modernisation brought new possibilities to Chinese architecture and cities as the country moved towards becoming a modern nation state.

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## NOTES

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65 UBCHEA RG11, box 218, folder 3702, report on building conditions by Perkins, Fellows & Hamilton.
66 Yang, *Zhongguo Jindai*, p. 279.
67 Liang Sicheng 梁思成, *Zhongguo Jianzhu Shi* 中国建筑史 [*A History of Chinese Architecture*] (Tianjin: Baihua Wenyi Chubanshe, 1998), p. 352.
68 For example, the Mayor's Building in Shanghai's proposed Civic Centre by Dong Dayou and Dahua Cinema by Yang Tingbao: see Xing Ruan, 'Accidental Affinities: American Beaux-Arts in Twentieth-Century Chinese Architectural Education and Practice', *Journal of the Society of Architectural Historians*, 61, no. 1 (March 2002), pp. 30–47 (p. 38).
69 Musgrove, *China's Contested Capital*, pp. 100–16.
70 Liang, *Zhongguo Jianzhu Shi*, p. 353; Kuan, 'Between Beaux-Arts and Modernism', p. 178.
71 UBCHEA RG11, box 255, folder 3810, A. G. Small to J. E. Williams, 3 May, 1916.
72 UBCHEA RG11, box 191, folder 3332, minutes of the twenty-ninth meeting of the executive committee of the board of managers of the University of Nanking, 27 April 1914.
73 UBCHEA RG11, box 225, folder 3810, A. G. Small to J. E. Williams, 11 December 1918.
74 UBCHEA RG11, box 224, folder 3798, pledge copied from the minutes of the annual meeting of the board of trustees of the University of Nanking, 14 January 1916; and box 218, folder 3702, letters between the architects, Diffendorfer and Williams between 2 February 1916 and 4 November 1916.
75 Yang, *Zhongguo Jindai*, p. 265. Similar arrangements can be observed in educational projects later designed by Perkins, Fellows & Hamilton in Chicago, including the Bay City Senior High School (1922) and Mishawaka High School (1924): Perkins, Fellows & Hamilton, Architects, *Educational Buildings*, pp. 91–111.
76 UBCHEA RG11, box 224, folder 3798, assistant treasurer to J. L. Severance, 8 May 1917.
77 UBCHEA RG11, box 218, folder 3702, J. E. Williams to W. K. Fellows, 29 June 1918.
78 UBCHEA RG11, box 218, folder 3702, Perkins, Fellows & Hamilton Architects to J. E. Williams, 17 June 1918.
79 UBCHEA RG11, box 225, folder 3810, A. G. Small to J. E. Williams, 16 July 1918.
80 Musgrove, 'Building a Dream', p. 140.
81 UBCHEA RG11, box 225, folder 3810, Small to Williams, 16 July 1918.
82 UBCHEA RG11, box 225, folder 3810, Small to Williams, 16 July 1918.

83 Leng Tian 冷天, 'Deshi Zhijian: Cong Chen Ming Ji Yingzaochang Kan Zhongguo Jindai Jianzhu Gongye Tixi Zhi Fazhan' 得失之间: 从陈明记营造厂看中国近代建筑工业体系之发展 ['Pain in Styles, Gain in Tectonics: A Study on the Development of Modern Building System of China, Through A Case of Chen Ming Ji Construction Company'], *Shijie Jianzhu* 世界建筑 [*World Architecture*], no. 11 (November 2009), pp. 124–27.
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91 Nanjing Difangzhi Bianzhuan Weiyuanhui 南京地方志编撰委员会, *Nanjing Jianzhu Zhi* 南京建筑志 [*A Historical Record of Architecture in Nanjing*] (Beijing: Fangzhi Chubanshe, 1996), p. 317.

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