Railway Colleges of China

Chen Guanmao

China today has more than 1,000 colleges. In addition to colleges under the direct control The State Education Commission (Department of Education) or local provincial governments, special municipalities (directly under the central government), or autonomous regions, there are many colleges that were founded and are managed by central administrative departments (e.g., Machine Industry, Water Supply and Electric Power, Traffic, and Railways), commissions (equivalent of ministries), general affairs bureaus, or general assemblies.

Many of the colleges managed by the central administrative departments, commissions, etc., have a long history, are adequately financed, and offer high levels of learning, hence they occupy an important position in higher education in China.

All these colleges are managed in conformity to laws and ordinances enacted by The State Education Commission. They gather gifted students through a nationally-unified entrance examination. Since the Department of Finance of the central government provides the general administrative expenses, it has a voice in evaluating educational practices. On the other hand, the costs for expansion of school buildings, equipment, etc., are provided by the Department of Educational Affairs. In addition, educational facilities at each college are determined based on the size of the teaching staff and the number of students prescribed for the college by the Department. Therefore, the Department of Educational Affairs plays the leading role in the appointment of college presidents.

Among such colleges, those belonging to The Ministry of Railways have the longest history and are most numerous. About 100 years ago, railways were at forefront of science and technology in China. In 1881, the Ch'ing dynasty constructed China's first railway between Tangshan and Xugezhuang with the aim of recovering the delay in development of China's economy and science and regaining the rights and interests in Chinese railways from the European powers. Then, by concentrating its engineering abilities, the dynasty proceeded to construct a number of railways, including the world-famous Beijing-Zhangjiakou Railway.

In addition, in order to foster Chinese engineers in railway construction and construction management, the government of the Ch'ing dynasty built two railway colleges in 1886 and 1909, respectively. They were The Shanhaignon School of Railway & Coalmining, the predecessor of the present South-West Jiaotong (Transport) University (in Chengdu), (it was renamed four times in 100 years, thus, Tangshan school of Jiaotong University, Tangshan Institute of Technology, and Tangshan Railway Institute) and The school of Rail Management, the predecessor of the present Northern Jiaotong University (in Beijing), (it was also renamed four times, thus, Beiping School of Jiaotong University, Beiping Institute of Railway management, and Beijing Railway Institute). Consequently, the Ch'ing dynasty paved the way for specialized education in railways in China. Thereafter, a specialized course in railways was established at Shanghai Jiaotong University which is under the control of The Ministry of Railways.

Until the birth of the new Communist government, several railway schools, including Jinchaji Institute of Industrial Transport, Huabei Institute of Transportation, and Dongbei Railway Institute, had been established in districts ruled by the Communist Party. During the war and postwar period of restoration, these schools produced many railway specialists.

After the new Communist government was established, the departments of higher education in railways were reorganized and consolidated. For example, the specialized course in railways at Shanghai Jiaotong University was made an independent

■ Shanghai Tiedao University *(Xu Shu)*

college. In 1953, the basic structures of the railway schools in Beijing and Tangshan were decided.

Around 1958, The Ministry of Railways founded a number of colleges in rapid succession in order to cope with the development of railways in China. In the early 1960s, those colleges were finally integrated into four railway institutes in Shanghai, Chansha (Hunan), Lanzhou (Kansu), and Dairen (Liaoning), and two railway medical colleges in Nanking (Kiangsu) and Shanghai.

In 1971, the Department of Education of the Board of State Affairs incorporated the Diesel Car Manufacturing Course of Shanghai Jiaotong University and the Railway Construction Course of Tongji University into the Shanghai Railway Institute.

In the 1980s, The Ministry of Railways founded Huadong Transport University (in Nanchang, Kiangsi) and Suzhou Teacher Training Railway College (in Kiangsu).

In 1984, the Shijiazhuang Army school of Engeering which had belonged to the Railway Corps of the People's Liberation Army was reorganized into a railway college called Shijiazhuang Railway Institute (in Hepei).

In 1995, The Ministry of Railways, with the approval of The State Education Commission, integrated the Railway Institute and Railway Medical College in Shanghai into the Shanghai Tiedao (Railway) University to be one of a few new colleges which include medical schools.

As a result, the total number of colleges under the jurisdiction of The Ministry of Railways (hereafter called the railway colleges) reached 10.

For more than 40 years, along with the increase in the number of railway colleges, the number of students of railway colleges has been increasing dramatically. In 1949, the number of students of the two colleges then under the jurisdiction of The Ministry of Railways was only 1,125. However, the total number of railway college students admitted jumped to 42,500 during the 1949-1975 period (including years of no enrollment during the Great Cultural Revolution). In the 5 years from 1976 to 1980, the number of railway college students admitted each year was 3,500 on average, increasing to 6,000 during the 1981-1985 period.

In the 1990s, the yearly enrollment of railway college students has further increased to 11,000 on average. Basically, it is now possible to meet the ever-increasing demand for personnel in railway construction, diesel car manufacturing, and train operation control needed for further growth of railways in China.

To supply much needed railway personnel, the individual railway colleges have established several unique faculties specializing in railways, in addition to the existing medical and teachers courses. Typically, these faculties include Railway Construction (railways, bridges, tunnels), Diesel Cars (design, manufacture), Railway Electrification, Railway Transportation (control, management), and Railway Signals (automatic control, remote control).

These specialized courses have been renamed from time-to-time. Essentially, however, they are closely connected with the four major elements of railway management—rolling stock (transportation), machinery (manufacturing and maintenance of diesel cars), construction work (railway construction and maintenance), and electricity (communications and signals). In early railway colleges, these specialized courses had much weight.

In addition to personnel specializing in the above fields of technology, railways require engineers in geology and hydrology, machining and materials, accounting, statistics, communications, computers, etc. The Ministry of Railways recruits such engineers annually from colleges outside its jurisdiction. On the other hand, it has established faculties for the appropriate disciplines in some colleges under its jurisdiction. In addition, to foster research personnel in the field of railway science, it has founded special courses in applied mathematics, applied mechanics, applied chemistry, applied physics, foreign languages, etc., in several railway colleges.

The special courses established by The Ministry of Railways in the medical colleges and teacher training colleges under its jurisdiction are not much different from those of ordinary medical colleges and teachers training colleges. The Ministry of Railways manages these colleges because it must provide medical care to those engaged in the railway business and educate their children. China is vast and its railways are scattered across the land. Therefore, it is necessary for individual railways to have their own hospitals and schools (primary and junior high). So such colleges provide them with medical and teaching staff.

From this viewpoint, it is said that the higher education provided by The Ministry of Railways is more or less characterized by introversion and exclusiveness. Yet, some railway colleges (or faculties) have a respectable history and offer a high level of education. It may be said that the influence of education provided by China's railway colleges makes itself felt not only within China but also in overseas countries. For example, many prominent Chinese figures, including Qian Xueshen, an authority on missiles, and Lin Tongyan, a specialist in bridge construction, now live in the United States, but graduated from China's railway colleges. This proves that Chinese railway college graduates are playing a leading role in diverse fields, not limited to railways. In other words, it shows one open aspect of China's railway colleges.

In addition to 4-year regular courses, China's railway colleges have postgraduate courses which aim to foster still higher learning. South-West Jiaotong University, Northern Jiaotong University, Shanghai Tiedao University, and Chansha Railway College grant doctorate degrees, and Lanzhou Railway Institute, Dalian Railway Institute, Nanjing Railway Medical College, and Huadong Transport University, grant master's degrees. Many of the doctorate and master's postgraduates of these colleges now hold important engineering or administrative posts. In addition, the individual railway colleges are involved in many diverse scientific research projects sponsored by the central, provincial and municipal

■ Shanghai Station *(Xu Shu)*

governments, and The Ministry of Railways. In the studies of problems involved in constructing high-speed railways in China, many departments of higher learning in the field of railways play a leading role.

To cope with the arrival of the peak in railway construction in China and the reformation of the railway operation system, the railway colleges have, in past years, expanded their special courses and at the same time, established new special courses in modern railway construction technology and new railway management systems. As a result, the total number of special courses at railway colleges exceeds 80. With the new special courses in commerce and economics, law, insurance, tourism, etc., the railway colleges are emerging as fully-fledged universities. The colleges that have widened their doors to meet the ever growing demand for railway personnel strive to develop the potential of their students and develop the personnel needed for building a new society and development of local railways. Therefore, they receive powerful support from the central and local governments.

From now on, based on China's educational development program, each school belonging to their associated department of the central government will develop under the management of, or with the cooperation of, the government of its locality. Therefore, China's higher education will move toward a bipolar management system of central and local governments.

At present, in view of the peculiarities of railway operations, The Ministry of Railways allows the railway colleges to devote themselves to teaching special knowledge. In the future, however, with the reformation of the railway management system, the manner in which The Ministry of Railways manages the railway colleges will undergo a marked change.

In China, there are two distinct concepts concerning the relationships between The Ministry of Railways and colleges. One is the relationship between The Ministry of Railways and ordinary colleges and the other is between The Ministry of Railways and colleges under its jurisdiction. With an extensive reform of the national economic system, the railway management system will undergo a series of drastic changes. Naturally, the two different concepts about the relationships between The Ministry of Railways and colleges mentioned above will change. Namely, the ordinary colleges will deepen their relationship with The Ministry of Railways, whereas the railway colleges will strengthen their relations with the general public.

The Ministry of Railways merged Shanghai Railway Institute and Shanghai Railway Medical College, both under its jurisdiction, into the Shanghai Tiedao University with the approval of The State Education Commission in May 1995. This was an important step taken to adapt to the coming new age. Incorporating the faculties of mechanics, electricity, civil engineering, telecommunications, transportation management, and computers of the former Shanghai Railway Institute and the faculties of clinical medicine, general medicine, etc., of the former Shanghai Railway Medical College, the new Shanghai Tiedao University is a large-scale university with many special courses, including five new postgraduate courses in mechanical and electrical engineering, civil engineering and architecture, medicine, information science and technology, and international economics, and four new faculties of engineering, medicine, economics, and literature.

As part of the reform of the educational system, Shanghai Tiedao University has, ahead of the other railway colleges, introduced a private student admission system and a free

■ Double-decker *(Xu Shu)*

■ Locomotives standing at Shanghai Station *(Xu Shu)*

course-selection system. Under the private student admission system, a certain number of students entering special courses strongly related to railways (of all the 72 regular courses now open to candidates) are awarded The Ministry of Railways' scholarship (excludes schooling and other expenses payable by students). The scholarship students are, after graduation, obliged to work at places specified by The Ministry of Railways. In addition, some departments in need of personnel have a scholarship system which provides a larger sum of money than the above scholarship to students wishing to obtain a job in the department offering the scholarship.

Ordinary students study at their own expense. They are allowed to take a job in any of The Ministry of Railways or elsewhere. By respecting the independence of students in selecting their jobs, the railway colleges are deepening relationships with society in the fields of communications, computer software, civil engineering and architecture (industrial and private), automobiles, refrigeration equipment, electrical equipment, accounting, English language, design, etc. Since it established a medical institute, Shanghai Tiedao University has, through its three affiliated hospitals, reinforced its links with society and increased its influence in society. This paved the way for establishing new high-level universities as a means to strengthen the social backing of railway colleges.

Shanghai Tiedao University which emphasizes The importance of training urban transport specialists, is planning to establish a city-type traffic institute. In view of the characteristics of such a traffic institute, the college has already established a policy of building the planned institute in cooperation with the private sector in the Shanghai district. With this policy, the college has abandoned the traditional idea of depending entirely on The Ministry of Railways for the funds it needs, opening a new way of funding railway colleges.

The system in which a governmental department of railways builds and manages colleges is found not only in China but also in the former Soviet Union and some other countries. As railway operations have been continually commercialized and privatized, those colleges have steadily become diverse in character.

However, this phenomenon represents only one of the ongoing processes of reformation. The commendable direction of reformation is that the railway operations be transferred from the government's centralized control system to the private enterprise management system in quick response to development of railway technology (changeover from system which depends primarily on special technology to system which employs mainly common technology) and to the development of railway management (changeover from unilateral management to multilateral management) and that railway operations be managed by individual branches under the supervision of the head office.

In China, the railways and railway colleges have a very close relationship with each other. The Ministry of Railways paved the way for the establishment of colleges and actually founded railway colleges, and has since continued to help them develop. On the other hand, the railway colleges have educated hundreds of thousands of superior personnel over 100 years and continued to support railway operations by supplying personnel required for efficient railway operations.

At present, China is seeing a peak in railway construction. The Beijing-Kowloon Railway running south-to-north, a new trunk line expected to help support the return of Hong Kong to China, is scheduled for completion in 1997. Construction of the Beijing-Shanghai High-Speed Railway, China's first rapid transit link, is about to start. The railway colleges are making significant contributions in these and other railway construction projects.

The reformation to modernize China's railway system is inseparable from the reformation of the railway colleges providing higher education in railways. Naturally, the reformation of the railway system will afford the railway colleges a good opportunity to introduce a new strategy. I am confident that China's railway colleges will make even greater progress in the coming 21st century. ■

Chen Guanmao

Professor Chen was born in Shanghai and graduated from the Department of Mechanical Engineering at Tangshan Tiedao University.

He worked at the China Ministry of Railways from 1975 as manager of the Department of Education. Since 1995 he has been a professor at and President of Shanghai Tiedao University.