Professor Wang Kuang-
His Life and His Works

王洸教授其人其書

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FOREWORD

For more than 45 years Professor Wang Kuang has been devoting his time and effort to the Chinese navigation. His outstanding contributions to the Republic of China in general and to the navigation world in particular have been known to most of the Chinese people. In order to provide a chance for peoples of foreign countries to get acquainted with Prof. Wang's life and works, we are now publishing this book in English.

This volume is a collection of selected articles on Prof. Wang either written by Prof. Wang himself or by his friends and newpapermen. It consisits of six parts. Part One deals with Prof. Wang's personal history and impressions by his friends of him. They are essentially factual and objective reports. Part Two contains two press reports on his distinguished achievements and a story about the honor he had received on the Navigation Day in 1965 on the occasion of his 40 years' continued service. Part Three includes two speeches made by Prof. Wang before foreign dignitaries on two separate events. Part Four is a collection of some of the important treatises written by Prof. Wang on the progress of modern transportation. Part Five and Part Six introduce Prof. Wang's more than 50 books on transportation science published in the past four decades and the book review.

We are greatly indebted to Prof. C. Y. Cheng (程振粵) for his painstaking work in compiling and editing this book. We also wish to record our thanks to Prof. C. S. Kan (甘其綏) for his assistance and advice and to Mr. T. C. Yang (楊泰傅) for proof-reading.

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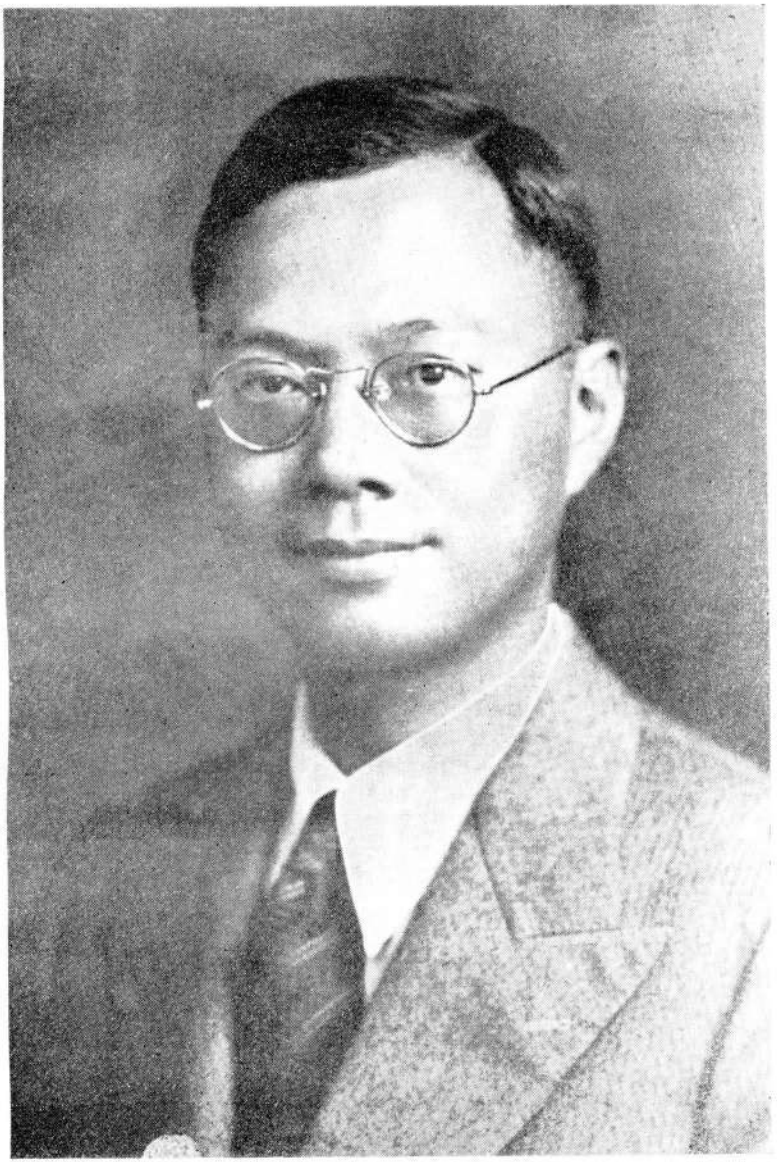

Professor Wang Kuang (1937)

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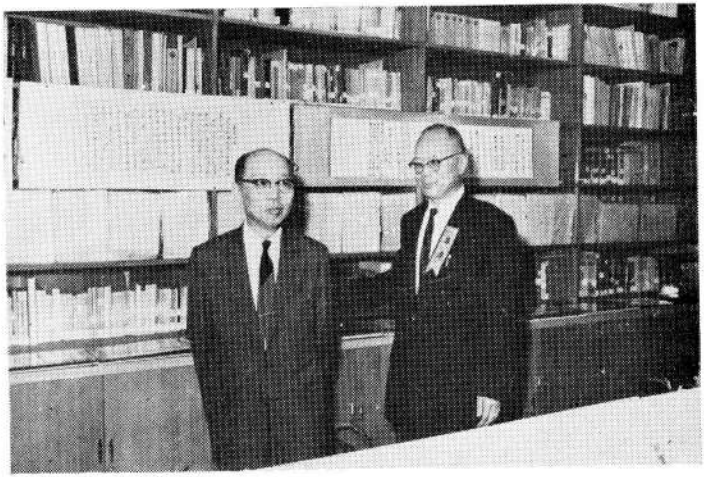
A congratulatory poem from Vice President C. K. Yen in 1965 (then prime minister) to Prof. Wang Kuang on the occassion of the 40th anniversary of Prof. Wang's outstanding service to the navigation world.



Former Premier C. K. Yen (嚴家淦 left) congratulates Prof. Wang on the 40th Anniversary of his outstanding service to the Republic of China

Former Minister of Education C. H. Yen (閻振興 left) personally sends his greetings to Mrs. Wang on the occasion of Prof Wang's 40th Anniversary of public service

Former Vice Premier Yun-wu Wang (王雲五 center) & Prof. C. H. Reun (任卓宣 Right) congratulate Prof. Wang on the 40th Anniversary of his outstanding service to the Republic of China.

Former Minister of Education Chi-yun Chang (張其昀 left) & Congressman S.Y. Sui (水祥雲 Right) personally express their greetings to Prof. Wang on the occasion of Prof. Wang's 40th Anniversary of public service.

PART I

MY MEMOIRS

by Prof. Wang Kuang

HOW I BEGAN TO WRITE

In recent years I have written quite a number of books in the fields of ocean transportation and communications. My friends often ask me about how and when I got the interest of writing. Frankly speaking, I began my writing purely by coincidence. And the original purpose of writing was by no means for academic learning. Strangely, I started writing as a "Chinese opera critic". As to my writing on transportation and communications, it was, in fact, encouraged by Mr. Wang Yun-wu (王雲五). My first book, "Chinese Navigation" (中國航業) was written when I was a student at the National Chaotung University in Peiping.

As we all know, a great number of students in Peiping were Chinese opera lovers. During the period between 1911 and 1924, most students at middle schools and colleges in Peiping were fond of listening and singing Chinese opera, very much the same like the students nowadays who are movie fans. When I was a student at the Affliated Middle School of Peiping Normal University, I as well as my schoolmates soon became Chinese opera lovers. I often spent three or four afternoons every week at the Chinese opera houses because at that time study load of middle school students was light. The place I often visited was Kwan Ho Building (廣和樓) where the famous Fu Lien Chen Opera School (富連成社) students had their experimental perfor-

mances. The famous actor, Ma Lien-liang (馬連良), was then just graduated but still with the troupe, and another celebrated actor, Tang Fu-ying, (譚富英), was still under training. After I had seen the performances, I usually wrote some comments and sent them to some local papers. More often than not, my articles appeared in the paper a few days later. My initial success in writing stimulated me tremendously and I began to write Chinese opera criticisms for some big newspapers in Peiping. My pen-names, "Tao Kung" (道公) and "Owner of Ting-li House" (聽鸝館主) soon became well-known to many readers. When I got acquainted with a number of friends in the Chinese opera circle and gained a broader knowledge in this field, I wrote more and more articles for the papers and was soon recognized as one of the leading Chinese opera critics at that time, although I was only a middle school student. Fortunately, everything went well without my father's knowledge.

It happened one morning my father discovered an article I wrote in the previous night. He was furious and ticked me off very seriously. Henceforth I was prohibited from writing criticisms on Chinese opera, but I must admit that my interest in becoming a writer actually stemmed at the time when I was a "Chinese opera critic".

I entered the National Chaotung University (交通大學) in Peiping in 1924. In those days there were many associations of fellow-provincials in the school with a view to promoting fraternity or achieving political aims. I and a few schoolmates also organized an association of Kiangsu fellow-provincials.

We published a quarterly called "The Light of Kiangsu" (蘇光). (Later known as Journal of Communications and Economics 交通經濟彙刊) with a circulation of nearly 2,000 copies. In 1927 I wrote an article, "Problems on Current Administration of Navigation by the Customs" which was published in the last issue of the year. I enumerated a number of reasons to argue that the customs, under the control of foreign powers at that time, should not be allowed to take care of the navigation administration, that the power should be retrieved to the Chinese Ministry of Communications, and that a Bureau of Navigation be set up in certain places. To substantiate my viewpoints, I also proposed an organic outline of the Bureau of Navigation. Quite unexpectedly, a few days later this article was reprinted in full in the Shun Tien Times (順天時報), a mass-circulated and influential Chinese language newspaper owned by the Japanese. Soon after, this article was again translated into Japanese by the South Manchuria Railway Co. and carried in their publication, "Chinese Navigation". Although I did not deem this a great honor at that time, it had a good deal of impact upon my writing on academic subjects in later years.

When I was studying at the National Chaotung University, my father was Chief of Navigation Section of the Ministry of Communications. He was instructed to compile the part on navigation administration of a book entitled "The History of Communications" (交通史). I often read his manuscript and jotted down some data from it. I started to write a book, "The Navigation of China" (中國航業)

with the data and materials I got from other sources and those from my father's manuscript. In addition, I expressed my personal viewpoints in regard to the problems on Chinese navigation. When the writing was completed, Mr. Wang Yun-wu, then Chief of the Bureau of Compilation and Translation of the Commercial Press (商務印書館), accepted it and included my book in his "Universal Library" (萬有文庫) series in 1928. This was my first book ever published. I felt most excited because the work of a college student of 21 was unbelievably accepted by the greatest publishers in China. The remuneration of 200 silver dollars did not mean much to a young man. Until now, whenever I met Mr. Wang Yun-wu, I still thank him for the encouragement he gave me in my early days of writing.

(Originally published in the Central Daily News, February 2, 1957)

I JOINED THE MINISTRY OF COMMUNICATIONS

In November 1926 while I was still a student at the National Chaotung University in Peiping, my father suddenly passed away. With the kind assistance of my father's friends and a heavy heart, I joined the Ministry of Communications as a part-time junior clerk. My experiece during that period is still vivid in my memory.

My father's name is Wang Chuo (王倬), alias Wang Yun-wu (王雲五). During the years of Emperor Hsuan Tung of the Ching Dynasty, he became an editor of the Commercial Press in Shanghai right after his return from Japan where

he had his advanced study. His major was law, but he was also interested in local administration. I still remember when I was a boy he wrote a book, "The Outline of Local Administration" (地方行政要義), a subject basically new to the Chinese at that time. Later he wrote another book, "The History of Communications" (交通史). Both were published by the Commercial Press and enjoyed a brisk sale. Although my father's name was the same as our former vice premier, and both were with the Commercial Press, they never worked together at the same time. Their namesake, however, has become a legend of the Commercial Press until today.

My father quit the Commercial Press in 1916, and joined the Ministry of Communications upon the request of the then minister, Hsu Shih-ying (許世英). He was appointed first as a senior clerk (主事) in the Navigation Department, and later became Chief of Navigation Section for many years till his death.

My father suffered from asthma and heart ailment after 40. His health failed repidly after my brother's death in the autumn of 1925. My brother, Wang Chun, (王沖) was graduated from National Chaotung University in Shanghai in 1923. He was a clever and promising young man. Right after his graduation, he was assigned to the Ministry of Communications and became Dr. John Earl Baker's assistant (Dr. Baker was later a commissioner of JCRR in Taiwan) to compile a uniform accounting system for the Chinese national railways. Unfortunately, he died of tuberculosis only one year after he had joined the Ministry. My father was so grieved at the

loss of his beloved son that his physical condition deteriorated day by day.

One very cold afternoon in November 1926, while I was attending class at the school, Mr. Sung Chien-shun (宋建勳) rushed to my classroom from the Ministry informing me that my father was critically ill in his office. I sensed that something unfortunate would happen. When I entered my father's office, I saw him sleeping in the chair, perspiring profusely and could not hear me at all. I was told that his illness relapsed suddenly soon after his arrival in the office. He died of heart paralysis at 51.

When I had finished my father's funeral, I was immediately confronted with the financial hardship of my family. I had to support my mother and my younger brother, Wang Chih (王治), who had just entered the National Chaotung University in Tang Shan. Thanks to the help of my father's friends, I got a job at the Ministry's Navigation Department with a monthly salary of fifty dollars. Since I was still a student at that time, I was excused from attending office regularly. I usually worked after class in Mr. Sung Chien-shun's Engineeing Section taking care of receiving and despatching official correspondences.

A few months later, a technician in charge of the issuance of seamen's certificates resigned. Since no one in his section knew English, I was transferred to succeed him. This was the beginning of my good fortune because I was soon promoted to be a clerk. In June 1928 when the Nationalist Government unified China, the Ministry of Communications

of the old regime was taken over along with other government institutions. I was selected from some 60 employees to go to Nanking to join the new Ministry as a senior clerk of the Navigation Department. In August of the same year, I went to Nanking to take up my new job. I was 23 at that time, and it was a story of 29 years ago. Until now I am still grateful to the kindness shown to me by the friends of my father.

(Originally published in Ta Tao Semi-Monthly (大道半月刊), June 16, 1957)

I FOUNDED THE COMMUNICATIONS MAGAZINE

Probably persons in the communications circle today may well remember a fairly wide-circulated monthly called The Communications Magazine published before our War of Resistance against the Japanese. Altogether it had 58 issues published regularly each month. When the war broke out in 1937, this magazine was compelled to suspend publication because the Chinese Government evacuated from Nanking at that time. It was a full fledged magazine with about 120 pages each issue. Its format was somewhat similar to the Communications Reconstruction Magazine now published in Taiwan, but its contents were almost double.

Two thousand copies were printed for the first issue. Circulation grew rapidly from 3,000, 4,000 to 5,000 copies in subsequent issues. Owing to its fine and rich substance, this magazine was well received by the people in the communications circle. Special issues, such as "Navigation", "Railway Rates", and "Transport Coordination" were also published with

nearly 500,000 words each. Undoubtedly, The Communications Magazine had established a firm position in the publishing world at that time. Regular subscribers included U. S. Library of Congress, Geneva International Library, Columbia, Harvard, Stanford, Princeton, and Lyon Universities. It would not be difficult to find a complete set of this magazine in any of these institutions today.

This magazine was published neither by the government nor by any private institution. Actually, this was promoted and sponsored by the schoolmates of National Chaotung University, or, to say it more explicitly, by myself. My associate was Mr. Wen Tsung (萬琮). Two other schoolmates helped me to do the compilation work.

The publication of this magazine was motivated by pure coincidence, or, I may say, prompted by the stimulation of unemployment. In the summer of 1931, the Ministry of Communications ordered me to do the ground work for the setup of a Navigation Bureau in Hankow (漢口航政局) to take care of the navigation affairs of Hupeh, Hunan, Kiangsi and Szechuan Provinces. This new institution was responsible to enforce the navigation laws newly promulgated by the Ministry. Since I was the prime mover of this project, the Ministry believed that I was the appropriate person to handle the matter. Because the director was not an expert in this field, I became the one who was actually doing the job. The success and limelight of a young man usually invite jealousy and even enemy. Two years later, when General Chen Min-shu (陳銘樞), Commander-in-Chief of the famous 19th Army,

took the post of Vice Premier and Minister of Communications, he dismissed practically all the senior officials of the Ministry and replaced them with his own aides. He also appointed immediately his former regiment commander to be the Director of Hankow Navigation Bureau. I was hinted by the new director to resign. When I returned to Nanking, I found it was impossible for me to stay on in the Ministry. I therefore became jobless.

Young men can never stay idle for a long time. After two months' unemployment, I began to feel the pinch. I got to do something for myself. In those days, academic learning was not so prevalent in the communications circle. There was no periodical in this field. I soon decided to found The Communications Magazine in the hope that with the experience I had in my schooldays in the publication of The Communications and Economics Magazine, and my subsequent connections with people of the communications circle, I might be able to start a new magazine and take up the work I was willing to do.

I had neither capital nor political support at that time. It was difficult to win other's sympathy before the magazine was published. Besides, I was a jobless young man. No person of high standing nor my former colleagues would like to give me their help. Some advised me to drop the idea, and some even laughed at me for ignorance of my position. Amid disappointment and frustration, I felt very much ashamed and crestfallen.

Fortunately, I finally won the support of Mr. Wei Yi-fu

(韋以黻), Technical Supervisor of the Ministry of Communications. Also, many friends promised to contribute their articles to my magazine. But the problem of financial difficulty still remained unsolved. I bought a desk with two dollars, got a seal for The Communications Magazine Society, and printed some letter papers and envelopes. The office of the Society was set up in my bedroom. I worte letters to my friends informing them that the magazine was scheduled to appear in October 1932. To my pleasant surprise, many valuable articles soon arrived, some were written by the chiefs of Railway, Telecommunications, and Postal Service Departments. The leading one was a contribution from Mr. Wei Yi-fu. I also wrote a few articles on navigation. After the completion of compilation, next came the problem of printing fee. The printing of 2,000 copies meant a good deal of money, and I had no means to finance it. Finally, I got the permission of a big publishing company in Shanghai to print the magazine on credit. I promised to pay the fee within one month after publication. Five hundred sheets of colored advertisements were posted everywhere in Nanking. As an expediency, I printed time tables of all national railways and other business announcements of communications agencies as advertisements without their prior consent.

When the first issue of The Communications Magazine was out, it looked pretty good. After the readers had noticed that many articles were written by well known persons and it carried so many advertisements, they began to believe that this was a magazine of sound standing. With the initial

success, it became much easier to solicit advertisement later and I soon made the two ends meet.

The Communications Magazine was eventually born after a long and hard struggle.

(Originally printed in "The Friend's Voice" (友聲), November 1953)

THE BLOCKADE LINE IN THE YANGTZE RIVER

(I) THE SINKING OF SHIPS

On August 12, 1937, with the fine cooperation of merchant ships, the Chinese Navy built up a Maginot Line in the Yangtze River, popularly know as the Kiang Ying Blockade Line (江陰封鎖線), in order to forestall the Japanese warships from steaming up to attack Nanking in rear. As a result, the Chinese Army was able to lick the Japanese in Shanghai for four months. The wise decision in establishing this blockade line augured the final victory of our war of resistance.

In the wake of the Marco Polo Bridge incident of July 7, 1937, Chinese troops in Shanghai were on the brink of a major conflict with the Japanese. The Chinese High Command decided to defend Nanking and fight the war of resistance to the end. To have the Kiang Ying Blockade Line built was a strategy mapped out long ago. The Ministry of Communications was instructed to "rent" the Chinese merchant ships for this purpose. Consequently seven ships were taken from China Merchants Steam Navigation Co. and 16 ships from private companies each of 1,000 to 2,000 tons.

They all arrived in time awaiting orders from the Ministry of War.

At 4 p.m. of August 11, ships were ordered to get ready to leave at 6 a.m. the next day, but the destination was not mentioned. At 6:30 a.m. of August 12, an order of "Sinking Ships to Blockade the Harbour" was issued by Commander Tseng Yi-ting (曾以鼎) of the Second Fleet. The warships led the way northward until they reached Chang Shan Harbour, the narrowest waterway near Kiang Ying. Instructions were given to every ship as to where it should be sunk. It was a splendid day, sunny and windless. Scuttling began at 6 p.m. The first batch to go down was the six ships of China Merchants Steam Navigation Company which was followed by 14 ships of private lines and 8 vessels of the Chinese Navy. Owing to the strong undercurrent, the ships could not be sunk astride as originally planned. To make the blockade more effective, 3 other ships and 28 pontoons left by the Japanese were also scuttled. The first phase of this blockade line was thus completed.

On September 25, 4 Chinese warships were used to form a subsidiary blockade line in the rear. Gravels totaling 8,856 tons and 185 junks were used to fill up the gaps. It took two months' time and some 2,000 laborers' work to complete the whole thing. This was further strengthened by two forts built on the south and north banks of the Yangtze River. Although it was heavily bombed later by the Japanese Air Force, it still remained to be a tough defense line. It was not until December 4, 1937 when the Japanese Army occupied Kiang Ying that the blockade line was bypassed by the

enemy. However, big Japanese warships were still held up for quite a long time. The glorious "Battle of Blockade" will certainly go down to the Chinese war history.

Another purpose of building the Kiang Ying Blockade Line originally contemplated was to catch all the Japanese warships and merchant ships plying in the Yangtze River at that time. Unfortunately, this military secret was divulged to the Japanese by a traitor, Huang Chu-yu (黃秋岳), thus permitting the Japanese ships to escape before the line was sealed. Huang and his son, a co-conspirator, were later shot in Nanking. Only two Japanese merchant ships were caught which became the first trophy we got since the Battle of Shanghai. The Chinese Government soon set the Japanese nationals free. I was ordered by the Ministry of Communications to take over these two ships and hand over them to the China Merchants Steam Navigation Company. The two Japanese ships were renamed "Kiang Han" (江漢) and "Kiang Shian" (江襄). The latter was sunk by the Japanese warplane in Huang Kang at a later date, while the former had rendered a valuable transportation service throughout the war.

Because the Kiang Ying Blockade Line had born a good fruit, two more blockade lines along the Yangtze River and some in other places were also built during the war. Eighty-seven merchant ships totaling 116,000 tons were used for the purpose. The Chinese Government in order to fulfill its promise, compensated the private steamship companies for the use of their ships totaling US$3,690,000 after the war. Also, it bought 11 war-surplus ships on their behalf and

formed a Union Steamship Line (復興航業公司) which has its head office in Taiwan and branches throughout the world. The ships all fly the flag of the Republic of China.

Undoubtedly, when the greenlight of counter-attack is given, Chinese merchant ships will be the vanguard to carry out the important tasks of landing troops and logistic supplies on the mainland. I am sure, they will do their best to help the government fulfill their mission as they did before.

(Originally published in Central Daily News, August 11, 1956)

THE BLOCKADE LINE IN THE YANGTZE RIVER

(II) THE BUILDING OF SHIPS

When the war broke out in 1937, the Chinese Government decided to fight the war to a bitter end. In order to forestall the invasion of Japanese warships and execute the policy of "Trading Space for Time", many merchant ships were scuttled in the narrow waters in East and South China and along the Yangtze River. In 1937 and 1938 the famous Kiang Ying Blockade Line and Ma Dong Blockade Line (馬當封鎖線) were built with scuttled ships loaded with gravels plus floating mines and shore batteries. The Kiang Ying Blockade Line was the first of its kind built by the Chinese Navy using 24 merchant ships totaling 43,000 tons. The Ma Dong Blockade Line was established later scuttling 18 merchant ships totaling 24,000 tons. At that time the Japanese warships were dodged from steaming up the Yangtze River. Even after the fall of the Kiang Ying and Ma Dong Forts, these

blockade lines still gave the Japanese a good deal of headache. It took them a long time to clear the waterway. Naturally, our military aim was achieved; but, on the other hand, we also suffered a great loss of our merchant ships. Our water transportation was badly crippled. This was, of course, an unavoidable sacrifice in the wartime.

On the afternoon of a day in May 1938, when I was in the office at the Navigation Bureau, I was suddenly summoned by the Minister of Communications Chang Cha-ngao (張嘉璈). With the presence of Vice Minister Lu Chu-fu (盧作孚), he told me that the High Command had decided to build a third blockade line in the Yangtze River behind the Ma Dong Blockade Line, and the only 12 sea ships now available and the 4 big river vessels of the China Merchants Steam Navigation Company had to be scuttled. The Minister said he had made it clear to the military authorities that our water transportation would be crippled if we scuttle all the ships; but we must find some other means to meet the war demand. I told the Minister that since war in lower part of the Yangtze River was at its height, these ships, especially the four river vessels, must be used to maintain transportation between Kiukiang and Hankow, and Szechuan and Ichang. Also, the 80,000-ton equipment of Hanyang Arsenal must be shipped by sea vessels because cranes were not available in river vessels. I pointed out that during World War I, reenforced concrete ships were once built by Allied Nations due to the shortage of steel. Similar examples could be found in Shanghai where the Nanyang Brothers Tobacco Company

built some reenforced concrete pontoons and British and American Tobacco Company also built a reenforced tug boat. In order to save the 16 ships we had, I suggested to build reenforced concrect hulks for military use. Vice Minister Lu shared my view and Minister Chang gave it his final approval. I was instructed to see the military authorities at once. The military authorities accepted our proposal but warned me that the mission must be fulfilled as soon as possible. What is more, the reenforced concrete ships should have the same capability as the 16 merchant ships.

A few days later the Supreme Commander's Headquarters formally approved the Ministry's plan. They asked for four big reenforced concrete ships within three months. The materials would be provided by the Fort Bureau of the Ministry of War. A sum of $200,000 was also appropriated for the purpose. After completion the ships were to be delivered to the Tienpi Engineering Office (田壁工程處) of Wu Han General Garrison Command Headquarters.

An ad hoc committee was immediately set up to moot the urgent military assignment. Mr. Wei Yi-fu, Technical Supervisor of the Ministry of Communications was appointed chairman of the committee, and I was named as his deputy. At that time I was fully aware that it was impossible to carry out the mission, if we did not have some ones with sound knowledge and good experience in shipbuilding work. Fortunately, I obtained the assistance of such able personages as Messrs. Yeh Tsai-fu (葉在馥), Yang Chin-lee (楊青藜), Chien Chong-gan (錢昌淦) and Tang Wen-ti (唐文悌). It

happened that my brother, Wang Chih (王治), was just the person in charge of engineering materials of the Fort Bureau. For the sake of expediting the work, I asked him to be the Chief of General Affairs Section of our committee concurrently.

The draft designs of the reenforced concrete vessels were discussed at the committee meeting. Mr. Chow Hung-chou (周宏沼), representative of the Ministry of War opined that the ships should be (1) big enough to blockade the entry of enemy's warships of deep drought; while the smaller warships, although able to pass through the gaps, would be blasted by our floating mines: and (2) strong enough to protect the mines behind the blockade line. According to his suggestions, it was resolved that the reenforced concrete ships should be 80 ft. in height, 24 ft. in width, and 12 ft. in depth. Two steel frames with a height of more than 20 ft. and strength of some 10,000 kilograms should be installed on the deck of each ship. The site of shipbuilding was located in Wuchang near the Yu Hua Textile Factory where a dry dock was soon completed.

The construction work of these four reenforced concrete ships started smoothly in June until one day in August when I was attending the wedding ceremony of Mr. Wei's son, a foreman came to see me saying that the water of Yangtze River went up all a sudden. While three ships floated, the fourth one was submerged in water. I rushed back to my office and told Mr. Chien Chong-gan, Chief of Engineering Section, that the military authorities needed the ships

urgently, and, if their requirement could not be met, all of us would be court-martialled. I asked him to go immediately to the site and find a way to save the ship. He went with a heavy heart. Fortunately, the water did not go up any further. After using a number of pumps, the ship emerged from the water again on the third day. Ten days later we handed the four ships to the military authorities. I was told afterwards that two of them were sunk in early October near Ko Tien (葛店). The other two were scuttled near Ching Shan (青山) before the fall of Hankow and Wuchang.

It is true that the reenforced concrete ships proved useful in blockading the river, but the real significance was the fact that we had saved 16 big merchant vessels, without which water transportation in Central China at that time would have been completely paralyzed. Also, 80,000 tons equipment of Wu Han Arsenal could never have reached I-Chang in time, let alone the establishment of this arsenal in Chungking at a later date. I therefore believe that the policy-makers should be far-sighted and the executive personnel should be undaunted in order to achieve success.

Upon the completion of the reenforced concrete ships, Mr. Chien Chong-gan was promoted to be the Chief of Bridge-Designing Bureau by Minister Chang. He was ordered to take charge of the building work of Kung Go Bridge (功果橋) on the Yunnan-Burma Highway. The bridge across the Lan Chong River (瀾滄江) was 500 ft. in length. It took two years to finish the job. Unfortunately, Mr. Chien was killed on his way back to Kunmin from Chungking. His

and property. How to prevent accidents is therefore the main responsibility of highway authorities.

During the period of our War of Resistance against the Japanese, I almost lost my life as a result of an accident on the Szechuan Kwangsi Highway. The bitter lesson remains vividly in my mind and the scar is still on my face. I am writing this story in the hope that traffic safety be further strengthened in the future.

In 1939 our War of Resistance reached a crucial stage. The Chinese army retreated and fought in mountain areas. Railways could no longer be used. As gasoline was extremely scarce in those days, it was impossible to transport all military and civilian needs by means of highway. Old junks of different types were used to meet the urgent war demand, but they were limited in number. Consequently, the Chinese Government decided to build its own wooden ships, and I, in the capacity of Director of Yangtze River Navigation Bureau, was instructed to supervise the shipbuilding work. In September 1939, the first batch of these wooden ships were launched at various places of Szechuan Province. They added a new strength to water transportation and were proved to be highly useful.

At that time, the sea coast of Southeast China was entirely cut off from the inland by the Japanese. The Chinese Government wished to open two new ports in Vietnam and Kwangchow Bay in order to obtain supplies from the outside world. In addition to the construction of a railway line in that area, water transportation was deemed helpful to link

plane was shot down by five Japanese fighters and bursted into flame. The death of Mr. Chien was not only my personal sadness, but also an irreparable loss to the nation.

After V-J Day, I returned to Hankow to take up my job as Director of Yangtze River Navigation Bureau. I made a survey trip along the lower part of Yangtzs River in order to map out a plan to salvage those scuttled vessels and clear the waterway. On board of S. S. Kiang An which was saved from sinking eight years age, the captain pointed at the upper part of two reenforced concrete ships near Ko Tien and grinned, "These are the ships you built years ago. The Japanese could never move them away. Through years of silting, the navigation route has changed its course." Although I lamented the death of Mr. Chien with whom I worked together in building these ships, I was gratified that after eight years of absence, I returned to my old job again.

(Originally published in "Chong Liu" Semi-Monthly (暢流半月刊), July 1956)

MY EVENTFUL JOURNEY ON THE SZECHUAN KWANGSI HIGHWAY

Proper maintenance and safety checking of motor vehicles are essential works of every highway administration. It is clearly stated in the traffic code that vehicles must have their lights on when people drive in the night. Excessive speeding is also strictly prohibited. However, these regulations are often neglected. That is the reason why so many highway accidents happened every year causing a heavy loss of life

up the railway and the highway. A shipbuilding office was set up in Luichow (柳州) to construct wooden ships for that purpose. I was appointed concurrently the director of that office. It was necessary for me to visit Luichow once in every three or four months. As a rule, I traveled by plane. In one early September of 1940, owing to a fare hike of Eurasian Airline, I decided to travel by bus this time so as to save some Government money. My colleague, Mr. Hu, strongly asked me not to take the bus because it was very risky, but I did not listen to his advice. The wayward bus almost took my life in this eventful journey.

The weather in September was still pretty warm in Southwest China. I soon reached Kweiyang that evening. The next day, I started my travel from Kweiyang to Chungking. When we reached Chikiang (綦江), the bus had a breakdown and we were transferred to an old bus without headlight and horn. It was assumed by the station master that it could reach Chungking at about 4 p. m., so the headlight was not necessary. However, when we arrived at a check point, the gendarmes found many Vietnamese pictures in a student's suitcase. The episode took as long as two hours before we were permitted to proceed. The driver who desperately hoped to reach Chungking before dusk accelerated the speed almost recklessly. I was tired and soon fell asleep. Suddenly, I heard a big boom and then lost my consciousness.

I was awakened by a familiar voice. I could not see anything as my head and eyes were bandaged. I soon learned that he was my good friend, Mr. Huang Sui-sung (黃壽嵩),

Director of Chungking City Bus Administration. He told me that he found me in the bus collided with a truck at a place about four kilometers from Chungking and two persons were seriously injured. He immediately took me to his car and returned to Chungking. He was now accompanying me to a hospital. As I was carried on a sedan chair, I heard some one said, "So pitiful is this fellow! His head is broken." Another one said, "The man is covered with blood. How horrible it is!" I suddenly felt heart-broken. I thought of my wife who was waiting for my return and having dinner with me. I thought of my colleagues and the official business I should report to the Minister of Communications. I regretted that I did not take the good advice of Mr. Hu. I wept bitterly.

The operation at the hospital was completed at 2 a.m., and my head and eyes were again bandaged. The doctor told me that the broken glasses were taken out from my head. I anxiously asked him whether I would be blind. He consoled me and said, "Although your face is scarred, you will not be blind." In fact, my wife told me later that the doctor worried very much about my eyes in the first three days. He only hoped that one eye could be recovered. It was really a miracle that my both eyes were saved.

My wife came to see me at 8 a.m. the next day. She told me that she has been worrying about me all the night and finally got the bad news. She took care of me for three weeks before I was permitted to leave the hospital. Just two days before I left, another episode almost again blinded me.

It happended that the nurse accidently put the tincture of iodine instead of protargol into my eye. I cried with pain. Fortunately, it was soon washed away.

Although I did not lose my eyesight, my nose bridge was badly snapped. It was revealed later that when the cars had a head-on collision, my head hit violently the chair before me. My glasses were broken into pieces which cut into my eyes. Luckily, the tortoise shell rim had enough elasticity to prevent the broken pieces of glasses to go deeper. Otherwise, I am a blind now.

The Minister of Communications, upon learning this news, came to see me at the hospital. He also issued an order to the highway bureau to set up an ad hoc committee on traffic safety. He ordered that cars without headlight should not be used and no car under repair should be allowed to take temporary mission. The fare of Eurasia Airline between Kweilin and Chungking was reduced to its original rate. Because I had lost too much blood at that time, I still suffer from anemia until today. I can never forget the kindness of Mr. Huang Sui-sung, without which I should have died long ago. I wonder whether he is safe now on the mainland.

(Originally published in Ta Tao Semi-monthly (大道半月刊), October 1, 1956)

THE BURNING OF A CITY

On September 2, 1954 the Communists shelled Kinmen wandonly and killed many of our people on the island. Same day five years ago, the Communists set a big fire which burned almost one half of the city of Chungking. As a result,

more than ten thousand people were killed. My wife and a number of colleagues of the Navigation Bureau totaling 17 persons became victims of the holocaust.

In the summer of 1949, our war against the Communist suffered a serious setback. The Yangtze River Navigation Bureau was ordered to move from Hankow to Chungking. My family and colleagues soon reached there. A few days later I received an order from Ministry of Communications in Canton appointing me concurrently as the Director of Navigation & Civil Aviation Department of the Ministry. I went to Canton immediately and left my family behind. On September 3 when I was in my office, I read a headline in the newspaper saying, "Chungking's Big Fire Burned and Drowned 10,000 People". The news was described in detail as follows:

"At 3 p.m. yesterday, several places near Chaotien Gate (朝天門) in Chungking caught fire simultaneously. It spread rapidly and soon was out of control. Houses in commercial districts were all wrecked by fire. The lower part of the city was completely razed to the ground. The fire was somehow under control after 9 p.m. Death toll mounted to more than ten thousand.

"When the holocaust was at its height, people rushed away for their lives. The streets were soon blocked. Those who could not find their way out were either burned to death or died of suffocation. It was like the eruption of a volcano.

"Some people reached the bank of the Yangtze River, but the fire soon burned the warehouses and ships in the

area. The river was covered with fire because of the burning gasoline. When they jumped into the river, they were either burned or drowned to death.

"The fire started simultaneously at several places. It was believed that it was set by the Communists so as to cause panic and achieve their subversive aims."

The news shocked and grieved me considerably. My Chungking Office near the Yangtze River must have been burned down. Did my colleagues manage to escape? How about the official documents? How about my aging mother? How about my wife and children? I tried to call Chungking the whole morning, but the long distance telephone was no longer available.

I soon received a telegram from the acting director of the Navigation Bureau saying that my mother and elder son were safe, but the whereabouts of my wife was unknown. Several colleagues died, he added. I suddenly felt paralyzed in my bed, and in a dream I saw my wife coming in with her hair dishevelled, her facing sweating, and her forehead bleeding. She gasped and grinned, "Our son had come back." The second telegram from Chungking said, "No news about Mrs. Wang. Altogether 17 colleagues and dependents died. Official belongings totally destroyed. Return immediately." I flew to Chungking the next day with relief funds given by the Minister. Mr. Chow, the acting director, met me sadly at the airport. "Any information?", I asked. "No information, sir." was the answer. I knew that there was no hope of my wife's survival. When I reached the office, I saw some

women there sewing funeral clothes. My mother-in-law and younger son came to see me with tears in their eyes. My mother and elder son were in bed. From them I learned the tragic story of my wife.

When the fire broke out, my wife ordered the servant to carry my mother and send her to our office at Lin Shen Road. The crowd surged upward to the higher part of the city. She could be safe had she run toward that same direction. However, after she got some belongings out from home, she turned her way downward to our Hsin Yi Road Office trying to take some clothes of mine from there. She took her son to the office, but when she wanted to return, the road was already blocked by the crowd. They finally went to the water front and took shelter in a wharf near Chao Tien Gate. Unfortunately, the wharf also caught fire and they had to jump into the river. My wife was seen no more.

My mother cried, "I would have been burned to death had not my daughter-in-law helped me. What a pity, she died for us." I again asked my poor son whose head was badly hurted. He said "Fire kept burning close to us. Mother and I could not but jump into the river. We held a quilt bundle by both ends, and it was grabbed away by a fat woman a short while later. I heard mother's call of my name, but I could see her no more. Without much consciousness, I caught a wooden board and was drifted along as water running downward. I could feel the hot water on top of me when I submerged in the river. The undercurrent almost

killed me. Had I not got hold of the wooden board tight, I could never have come up to the surface again. At long last, I saw a fishing boat and begged the fisherman to pick me up. He reluctantly put me abroad after I promised to give him a reward. I did not see mother at that time. The fisherman sent me home the next morning and was duly rewarded.

I was told that there were thousands of corpses floating in the river, and it was impossible to identify the body of my wife. Nevertheless, I decided to look for her in person.

The next day I went to the very site where my wife was drowned. I with my two sons knelt down and cried:

"You have saved my mother and fulfilled you filial piety.

"You attended me day and night for more than twenty days when I was in the hospital.

"During the years of war, you lived in a small village and fed the baby with your own milk. As a result, you became thinner and weaker ever since.

"You never liked luxurious things. You encouraged me to be a pure-handed civil servant.

"You are a good painter especially of birds and flowers. I never arranged an exhibition for you in Hankow after the war, because I don't want people think that I took advantage of my position. Your talent was thus concealed without due recognition.

"Your gracefulness, your beauty, and your kind heart had won the respect of all who know you. You cheered me up in my early days and became my prop and

mainstay in my middle age. You have given me too much, but I have given you so little.

"You are only 37. You died and left your mother, me and our sons behind. I was unable to see you when you died. Now I cannot find your remains. You have suffered too much indeed.

"I must take the revenge."

My sons wepted and my colleagues sobbed amid the murmuring of the Yangtze River.

Three days later, a memorial service was held at Chang An Temple for my wife and the deceased colleagues. I finally exhibited her paintings with the ink and brushes. All those attended the funeral service were tearful when they saw the postumous exhibition.

It was a fine day on September 2, 1954. My wife, Chun Ju (俊如), went to office and my two boys went swimming. I did not want my sons to think of the tragedy, nor Chun Ju to share my grief. I stood in the yard with tears in my eyes and prayed:

"In Taiwan I have built another home. Your sons have been grown up. They are healthy and strong. Our elder son, Popo, is seventeen now. He is a good swimmer and sharp shooter. Maomao, our second son, is fifteen, naughty but intelligent. I married Chun Ju for four years. She loves the boys just like her own. She is also a government employee. We work together to support the family. I have accomplished nothing in recent years except writing a few more books. This is what you wished me to do. After the recovery of our

mainland, I shall take Chun Ju and our two sons to the riverside where you died to see you. The time would not be long. May your pure soul forever rest in peace."

(Originally published in "Friend's Voice" (友聲), October, 1954)

THE SEARCH FOR A BOOK

One summer day this year, Mr. Chao Su-chen (趙叔獻), Manager of Taiwan Commercial Press, sent me a book, "The History of Communications", published in September 1923. He said, "I finally got the book written by your father through a friend in Hongkong."

I was overwhelmed with joy because the work of my father thirty-two years ago, which I wished to have for a long time, was eventually found.

This book was a collection of lecture notes written by my father in 1922 when he was an instructor at the Training School for Communications Personnel operated by the Ministry of Communications for the purpose of upgrading the technical know-how of staff members of the Ministry and its affiliated organizations. The period of training was three months. It was similar to the one sponsored by Minister of Communications Ho Tsung-han (賀衷寒) a few years ago.

There was an interesting episode concerning the publication of this book. One of my father's students was a telecommunications personnel. He was later appointed director of a telecommunications office in a county of Kiangsu

Province. He sold the manuscript of my father's work to the Commercial Press in Shanghai under a disguised name of Wang Kuo-hua (王國華), and got two hundred silver dollars from the book company. This was soon discovered by Mr. Fang of the Commercial Press and a charge was to be levelled against the ficticious writer. He admitted that he obtained the money by false pretenses to cure his tuberculosis. My father pitied him and did not want to have the money returned. The book, however, was published in my father's name.

I had carried this book with me all the time until the day when I was forced to leave Nanking with the advent of the Japanese army. I lost all my belongings including, of course, my father's book. In recent years when I wrote books on communication subjects, I always wished to read it. Now the book is again in my hand. I read it and find as if his admonitions are still ringing in my ear. To commemorate this happy occasion, I dedicated my book, "The History of Chinese Navigation" (中國航業史) to my father in September 1955.

Following is the foreword of my father's book, the meaning of which is still new, although it was written thirty-two years ago.

"The history of Chinese communications is a glorious one. Several thousand years B.C., Chinese communications were already well-developed. Further achievements were made in subsequent years. It is a pity that the Chinese students nowadays simply know how to admire the progress made in this field in Europe and America in recent

Mrs. Yi-yin Chien Wang; Photoed in 1948 at the age of 36.

decades. They forgot entirely our own glorious past. It is true that we have not made such rapid strides as in some foreign countries and we are far lacking behind them in many respects.

"The fundamental idea of economics lies in the desire of human beings. Communication is a science under the scope of economics. The early desire of human beings was mere existence. As civilization advanced, human intelligence and technical knowledge began to create a greater desire and progress which was made more conspicuous in the field of communications. However, the achievements were first utilized for political purposes and later opened to the general public. Due to different internal and external conditions, the pace of progress made in different countries has not been the same.

"China has a vast territory but is thinly populated. We live on agriculture and are self sufficient. The rulers of all the dynasties adopted a policy of isolation. As a result, very little progress was made in the past few thousand years in the field of communications. In other words, Chinese government had never transferred communications from the field of politics to economics. With the founding of the Chinese Republic, we are catching things up and have accomplished in recent decades a good deal in railways, telegram and telephone, navigation, and aviation. But what we have achieved so far is far behind that of the advance countries.

"After reviewing our ancient history of communications, there were many things we can be proud of. But a study of

our modern history left much for us to be ashamed. The former gives us encouragment, while the latter gives us introspection. The learning of facts would help us to know its historical development, and see how communications are closely linked with economics. This is the primary purpose of the present writing.

"In the compilation of history, people usually divide it into three periods, i.e., ancient, medieval, and modern. This book is divided also into three parts: Part I, from ancient time to the South and North Dynasties; Part II, from Sui Dynasty to Ming Dynasty; and Part III, from Ching Dynasty till today. It is somewhat similar to the way of writing of Western history. For comparative study, I also list events according to the chronological order occurring both in China and foreign countries in the field of communications. I shall write two separate books dealing with the history of communications in China and that in foreign countries when time warrants."

(Originally published in "Friend's Voice", (友聲) December 1955)

ANECDOTES OF THE MINISTRY OF COMMUNICATIONS

What I am stating here are the civil service system and some of the anecdotes on personnel setup of the Chinese government during the period of late Ching Dynasty and early Chinese Republic. I joined the Department of Navigation of the Ministry of Communications in December 1926 as a

clerk, and concurrently, one of the compilers of an official publication, "The History of Communications". As a result, I was permitted to have access to certain official documents of both the Ministry of Post and Transmittance (郵傳部) of the Ching Dynasty and the Ministry of Communications of the Chinese Republic.

The Ministry of Post and Transmittance of Ching Dynasty was established in 1906 in charge of the administration of railways, telecommunications, post, and navigation of the whole country. Since this was a new setup, both personnel and functions were comparatively well organized. Many new persons were appointed to important posts. The head of the Ministry was called "Shang Shu (尚書)". There were two vice ministers called "Tso Shi Lang (左侍郎)" and "Yu Shi Lang (右侍郎)" very much like today's political vice minister and administrative vice minister. Under the vice ministers, there were four senior officials to help handle the ministrial affairs. They were called "Tso Chen (左丞)" and "Yu Chen (右丞)", "Tso Tsan Yi (左參議)" and "Yu Tsan Yi (右參議)".

In the Republic of China, "Shang Shu" was called the Minister. He had only one vice minister as his deputy. The Ministry of Post and Transmittance was divided into four departments, i.e., shipping, railway, telecommunications, and postal service. Shipping Department is called Navigation Department today which ranked first at that time. The head of each department was called "Chang Yin" (掌印)

or Seal Holder. No division was made under each department because workload at that time was not heavy. Shipping Department had 7 or 8 staff members; all of them should sign on the drafts of official documents. In addition to regular appointees, there were also extra employees.

The rank of government officials in the Ching Dynasty was divided into nine grades. "Shang Shu" belonged to Grade I; "Shi Lang", Grade II; "Tso Chen" and "Yu Chen", Grade III; "Tso Tsan Yi" and "Yu Tsan Yi", Grade IV; "Lang Chung" (郎中) and "Yuan Wai Lang" (員外郎), Grade V; "Chui Shi" (主事), Grade VI; and "Sher Ching Kwan" (小京官), Grade VII. Those belonged to Grade VII and Grade IX were somewhat the same as clerk and copyist of today. Each rank had an affiliated grade, such as Affiliated Grade II, Affiliated Grade V, etc. for those appointees of lower qualifications.

After the founding of the Republic of China, civil service system of the Ministry of Communications, like other ministries, underwent a change, but the official rank was also divided into nine grades. Minister belonged to Grade I; vice minister, Grade II; counselor, department chief, and technical supervisor, Grade III; inspector, technical expert, and secreatary, Grade IV or Grade V; and clerk and technician, Grade VI to Grade IX. Grade VI to Grade IX were again divided into 3 steps each. The appointees of this category could stay on their jobs for life, if no serious dereliction of official duties was found. The jobs of extra personnel were by no means permanent. They were usually dismissed by new minister.

Most probably, the chiefs of the departments would tender their resignation when a new minister assumed his duty. According to tradition, chiefs of railway, telecommunications and postal service departments had fewer changes. The chief of navigation department was removed more frequently. Three persons who held the job of department chiefs during that period are now in Taiwan. Mr. Liu Ching-shan (劉景山) was the chief of railway department, and Mr. Lin Tih-an (凌鐵菴) and General Chang Chun (張羣) were the chiefs of the navigation department. General Chang Chun was appointed in 1924. He stayed on the job for about one month only.

(Originally published in Central Daily News, May 11, 1957)

THE HOBBY OF PAINTING

I am sorry to say that not only I don't know how to paint, but my calligraphy is also very poor. Perhaps, it was due to the fact that my father and my wife were amateur painters, I became interested in painting and calligraphy. At one time, painting was my only hobby, although I was not a painter myself.

I was working in Hankow after World War II. Life appeared to be peaceful and quiet at that time. My wife, Yi Ying (錢懿瑛), began to renew her interest in painting. There were several ancient and contemporary painting exhibitions held every month in Hankow and Wuchang. As a pastime, I missed none of them. The painting brokers,

upon learning that I was a regular visitor of every exhibition, soon got my home address and came to see me. They told me many interesting anecdotes of the artists which further heightened my interest in painting. In the end I always bought some from them. My wife welcomed their visits at first, but when she discovered that I had spent a great part of my salary in buying paintings, she asked the servants not to let them in any more. To my astonishment, I did not see those brokers for a long time. I soon became impatient and went to see them. They were quite sympathetic with me and agreed to sell me paintings at a special discount and even permitted me to pay by installments. I put up the paintings I bought all over my sitting room and bed room as if an exhibition was on every day. Of course, I enjoyed it very much. When I went to Nanking on field trips, I would, as a rule, buy some paintings with my travel allowance. Although my wife was not happy about my unwarranted spending, she nevertheless tolerated me because she knew my life was rather monotonous. When I realized that my hobby had seriouly effected my family budget, I began to keep aloof from the brokers. However, I still went to the pasting and mounting shops when I had time to appreciate the paintings there.

When the political situation turned from bad to worse in the autumn of 1948, I lost entirely my interest in collecting paintings. On September 2, 1949 the Communists burned the lower part of Chungking City and my wife, Yi Ying, tragically died at that moment. Chungking fell on November

29 that year. I took my two sons to Taiwan and left all the paintings behind. For nine years I had never renewed my hobby.

Strange to say, when I awaited the plane at Chengtu airport to take me to Taiwan in 1949, I met Mr. Chang Mu-han (張目寒), who was supervising the evacuation of Control Yuan personnel. We talked and I soon found he was also very much interested in painting. He showed me some ancient masterpieces with him and we became good friends thereafter. After my arrival in Taiwan, he introduced me to Young Chun Ju (楊俊如) and later we got married.

Chun Ju was an accountant in the Ministry of Audit for ten years. She never liked painting. However, since she got acquainted with Mrs. Sun Chin-sheng (孫金生), a famous painter, and my cousin Miss Yuan Shin-lien (袁行廉), she began to enjoy it. It testifies to the fact that a person's hobby can be created under certain circumstances. What is more, the hobby I had kept away for nine years has revived again.

(Originnally published in "Friend's Voice" (友聲) in May, 1957)

I LOVE SONGS OF KUAN

When I was a middle school student in Peiping, I was very fond of the Chinese opera. People called me Opera Fan. After entering the National Chaotung University, my interest was shifted to "Songs of Kuan" or "Kuan Chu" (崑曲), which was originated from Kuan Shan, a place near Soochow. My professor, Ku Chung-chu, (顧宗泰), a native of Kuan

Shan (崑山), was an expert in this art and encouraged me to learn it. He said, "To sing Kuan Chu would swell your lungs, is good to your health, and moderates your mentality." He recommended his fellow-provincial, Mr. Chien Pei-san (錢柏森) to teach me two famous songs, "Che Lu" (折柳) and "Yang Kwan" (陽關). When I was transferred to Nanking to be a staff member of the Ministry of Communications, Mr. Chien again requested an old actor, Shih Kwei-lin (施桂林) and famous flute player, Chao Chun-yun (趙椿鋆), to teach me such songs as "Sher Yen" (小宴), "Chin Bien" (驚變), "San Tsui" (三醉), "Ting Ching" (定情) and "Tze Ho" (賜盒). It established my foundation of singing the songs of Kuan. Because of my excellent gift of hearing and a good knowledge of Chinese opera, it was not difficult for me to learn Kuan Chu. I could follow the tune of flute and sing just after others had sung a few times. Soon I knew many songs of Kuan, although I did not understand exactly the meaning of them.

To sing Kuan Chu needs fine vocal expression and strength, without which you can never follow the tune of the flute. It is different from the Chinese opera in which the Chinese violinist can always match your pitch. Also, Kuan Chu is sung along with dancing. The actor must have a good figure before he can have a good performance. According to my experience, to sing Kuan Chu needs better cultural training than to sing Chinese opera.

My first public appearance to perform Kuan Chu was in May 1935. On the occasion of a charity fund-raising campaign in Nanking, I was asked to sing "Ting Ching Tze

Ho", a story about Emperor Tang Min-huang (唐明皇) and his beloved concubine Yang Kwei-fei (楊貴妃). It was just three days after my wedding, and my bride was also among the audience. When I appeared on the stage, the capacity audience gave me a thunderous applause. I felt exceedingly happy at that moment. This is the most unforgettable occasion throughout the 30-year history as a Kuan Chu lover.

Following is the origin of Kuan Chu and its way of singing:

"Kuan Chu, or Songs of Kuan, was a kind of song called Shui Mo Rhythm (水磨調) originally invented by Mr. Wei Liang-fu (魏良輔) in Ming Dynasty at Kuan Shan near Soochow. At that time there were four ways of singing: (1) Hai Yen Rhythm (海鹽腔), (2) Yu Yao Rhythm (餘姚腔), (3) Kuan Shan Rhythm (崑山腔), and (4) Yi Yang Rhythm (弋陽腔). The most popular one was Kuan Shan Rhythm or Kuan Chu because the tune was more enchanting. It has been prevailing until today.

"Many Chinese plays can use Kuan Chu as melody. Some miscellaneous melo-dramas (雜劇) of Yuan Dynasty can also be sung by Kuan Chu.

"Rhythm may be divided into two different categories, i. e., the Northern Rhythm and the Southern Rhythm. The former had seven tunes just like 1, 2, 3, 4, 5, 6, 7, in western music. The latter had only five tunes, short of 4 and 7. The Songs of Kuan, or Kuan Chu, can be good melody both in Southern and Northern Rhythms."

(Originally published in Newsletter of Jen Society (仁社), July, 1963)

ONE OF THE COLLEAGUES I DEEPLY ADMIRE

By Chi-shen Chien (錢其琛) *Vice Minister of Communications*

I first knew Prof. Wang Kuang in 1926 when we worked together in the former Ministry of Communications in Peiping. When the Chinese Nationalist Government set up its capital in Nanking, Prof. Wang became the senior clerk and division chief of the Department of Navigation of the new Ministry of Communications. He was later promoted to be Director of Navigation Bureau for Yangtze River Area, while I was also a member of the Ministry. We often contacted each other on various occasions. Since the outbreak of Sino-Japanese War in 1937, the navigation administrative work in that area became increasingly important. Prof. Wang shouldered a very heavy responsibility at that time and did make significant contributions during the tenure of his office. After V-J Day, he became Director of Navigation Department of the Ministry and we saw each other quite frequently. I have known Prof. Wang well for 40 years. He is one of the colleagues I deeply admire.

Prof. Wang started his career in the field of communications when he was only 20 years old. For 40 years he has been devoting his time and efforts to improving navigation facilities and developing navigation services. His outstanding contributions to his country are indelible. In recent years, besides taking charge of the Taiwan Navigation Company's board of directors, he also teaches at many

colleges and universities. As a public functionary, he is loyal to his duties and handles official affairs fairly and seriously. As a teacher, he teaches patiently and is highly respected by his students.

Although Prof. Wang is now 60 years of age, he is still hale and hearty. After office, he used to string his knowledge and experience together in writing various books on transportation and to participate in public and private social activities to promote academic studies. He offered great help to his Alma Mater on her reactivation in Taiwan and rendered invaluable service for our alumni association.

Prof. Wang is sincere and modest. He disciplines himself rigidly and studies earnestly. He is one of the few navigation authorities in contemporary China. His virtues and writings are so familiar to all that I don't think it is necessary for me to add anything here. (Maritime Quarterly, July 1965)

PROFESSOR WANG KUANG AND I

By Prof. C. Y. Cheng, (程振粵) *National Taiwan University*

This year marks the 40th anniversary of Prof. Wang Kuang's continued service in navigation work. With a view to commemorating his distinguished contributions to the nation, the Maritime Quarterly decided to publish a special issue in his honor. Prof. Wang and I have been good friends for almost 30 years. In fact, he is one of the most admirable friends that I ever have. On the occasion of this auspicious day, it behooves me to say a few words about what I know of him.

Prof. Wang studied at Chao Tung University in Peiping and took his advanced learning in the United States, while I was graduated from Chao Tung University in Shanghai and received my graduate eduation in Great Britain. Although we had no chance to see each other during the period of our student days, we knew each other quite well through our writings published in academic journals or newspapers. It was not until the time of Sino-Japanese War that we first met in Chungking when we both taught at Chao Tung University. We immediately became good friends after a brief exchange of greetings. Since then I always found chances to talk with him. I knew him better and admired him profoundly. In the spring of 1954, I came to Taiwan from Hong Kong to work in the Aid Refugee Chinese Intellectuals, Inc., an institution sponsored by U. S. Congressman Walter Judd. One day Prof. Wang suddenly came to my office. I

was overwhelmed with joy when I had him before me. It was really fortunate that we saw each other again after a long separation. He told me that he arrived in Taiwan right after V-J Day and now Director of Navigation Department of Ministry of Communications. He said that when he knew that I was in Taipei, he was so happy that he had to come and see me at once in spite of his pressing official duties. I was deeply moved by his friendship and sincerity. Sometime later we both taught at Provincial Cheng Kung University in Tainan. We often had dinner together after class and kept talking till midnight before we caught the night express train to return home.

Prof. Wang is a paragon of Chinese traditional virtue. In dealing with others, he always shows his highly refined quality of a learned scholar. He treats anyone sincerely, disciplines him rigidly, follows faith and righteousness strictly, and discern right from wrong unequivocably. All of these qualities are by no means easy for an ordinary person to possess. For instance, he has been Board Chairman of Taiwan Navigation Company for six years, yet he takes bus to go to his office every morning. Once I asked him why TNC could not provide a car for its board chairman. He said, "TNC was in the red for many years. This is not the time for us to be extravagant. My most urgent task is to make TNC both ends meet. I don't care about having a car for myself." Let us ask who else among the Chinese VIPs today can do the same like Prof. Wang. Actually, TNC is now quite profitable, yet he takes bus to his office every

morning as usual.

Prof. Wang's seriousness in doing his job and his high sense of responsibility can seldom be found in China nowadays. Once he had some difference of opinion on official business with his boss. He resigned forthwith when he knew that his idea could not be accepted. Such a strong attitude can hardly be seen in Chinese politics.

Prof. Wang is an authority in transportation science. Many colleges and universities in Taiwan invited him to teach. Although he is a busy man of advanced age, he wishes to impart his knowledge to the younger generation. He is now teaching at National Chengchi University, Provincial Cheng Kung University, Private Tatung Engineering College, Private Tamkang College of Arts and Sciences, Provincial Maritime College, and Private Min Chuan Girls' College of Commerce on subjects of modern transportation. He teaches 24 hours a week traveling between Keelung in the north and Tainan in the south. Though strenuous, he enjoys his work with tireless effort. At one time I was also a part-time professor at Cheng Kung University. However, I soon resigned because I found the long distance travel between Taipei and Tainan unbearable. Compared with Prof. Wang's ten-year continued teaching service there, I certainly feel greatly ashamed. Under his enthusiastic instructions, thousands of young students have been trained to become new blood of Chinese communications.

In regard to Prof. Wang's contributions to public service, it should also be prominently publicized. He was Director of

Navigation Bureau for Yangtze River Area for 11 years. During his tenure of office, it was the period of China's War of Resistance against Japan followed by post-war rehabilitation. His job was most difficult to handle at that juncture. However, among others, he accomplished three major tasks. The first one was the establishment of winching stations between the rapid waters of I-Chang and Wan Hsien by using mechanical power to replace manual labor for the purpose of expediting water transportation. Not only did this new measure save a great deal of lives and properties, but also strengthened the flow of war supplies. Winching stations were later used along Chia Lin River and Yuan River setting a new era of Chinese navigation history. His second feat was the reversion of ten wharfs in Hankow, Nanking, and Chiukiang from Jardine, Butterfield and Swire, and NYK Steamship Companies after the Second World War. These were subsequently used as public wharfs. From then on the Chinese merchant ships were no longer at the mercy of predominant foreign merchants. It had the same significance as the retrocession of navigation powers. His third achievement was the salvage of sunken ship after V-J Day. At that time many of the sunken ships blocked the Yangtze River waterway. Although it was imperative to salvage those ships immediately, the Chinese Government did not have the means to do it. After his on-the-spot investigation, Prof. Wang submitted a report to the Minister of Communications suggesting the Ministry to make a public announcement that unless the ships were salvaged within two months by their

rightful owners, they would be salvaged by others. The Minister accepted his proposal and many ships were thus salvaged soon afterwards. As a result, not only the navigation route was cleared, but many new ships were added to the Chinese merchant fleet.

After his arrival in Taiwan, Prof. Wang Continued his job as Director of Navigation Department of the Ministry of Communications. A year and 4 months later, he was transferred to be adviser and then elected Board Chairman of Taiwan Navigation Company. His contributions to Chinese navigation are known to all.

Speaking of writing, Prof. Wang is unrivaled among many of his friends. Despite his busy official duties and 24-hour teaching assignment every week, he still finds time to write books. He has completed 40 books so far, a happy coincidence with his 40-year service anniversary. My unforgetable impression is that after the publication of his book, he invariably sent me a copy asking for comments. His sincerity and modesty touched me profoundly.

The above succinct account of Prof. Wang's refined virtue, brilliant career, and prolific writings may serve to portray his unusual personality. In China we have an old saying that three features make a man immortal, i.e., good virtue, distinguished merit, and imperishable words. It is difficult to find a person who possesses any one of them, but in the case of Prof. Wang, he practically has all the three. I can hardly find any of our friends who has such an extraordinary gift. I feel greatly honored to say a few words for a great friend of mine. (Maritime Quarterly, July 1965)

PROFESSOR WANG KUANG—PIONEER OF OCEAN TRANSPORTATION STUDY IN CHINA

By Lin Ts'ui (林翠)

(I) Profile of Prof. Wang

I very seldom write biography of persons in contemporary China. The purpose is not difficult to find, i. e., the deeper I know the worldly affairs, the more disappointed I had on them. More often than not, I discovered that many a so-called "prominent" figure has behind him much concealed hypocracy and meanness. However, I am willing to write the biography of Prof. Wang · Kuang because he is really a virtuous gentleman with great ideal, knowledge and ability.

It is often said that slander invariably follows popularity. But in the case of Prof. Wang, owing to his modesty, he virtually has no "enemy". To the best of my knowledge, any one who knows Prof. Wang speaks highly of him.

Prof. Wang so far has written more than 40 books on ocean transportation. He well deserves the title of "Pioneer of ocean transportation study in China". Though a prolific writer, he is by no means a "bookworm" type scholar. On the contrary, he is a very capable administrator. He held many important positions in the past and made significant contributions to his country in her days of trials.

Fourteen years ago he was elected board chairman of the government-owned Taiwan Navigation Company. For nine consecutive years of service, he renounced the privilege of

having a car for himself. I believe that he was the only board chairman of any government enterprise who went to his office by bus.

Before and after his retirement from public service, he has been teaching at several colleges and universities. As a result, he has students all over the world. For three years I had the privilege of teaching with Prof. Wang at the same school. He had classes in the day department, but, strangely enough, my night school students also paid him high respect whenever his name was mentioned.

The above may be considered as a sketch of Prof. Wang's profile. In view of his exemplary personality, I take great pleasure in writing his biography.

(II) Sadness in early years

Prof. Wang was born in 1905 at Wu Chin County of Kiangsu Province. He went to Peiping with his father at the age of 12. Two years later he entered Shung Chi Middle School. He soon became a little Peiping opera fan, and in consequence, he neglected his school work. One day his "secret" was discovered by his father who gave him a real dressing down. His father also ordered him to submit a statement of repentance to his teacher who later wrote on it his comment: "The poor school work of this student was due to his frequent visit to the Peiping opera house. He has been seriously reprimanded by his father. In this statement he frankly told the truth and vowed his repentance. This testifies that if a family has a strict father, the kids will know how to behave themselves. Since he knows how to put

forth his efforts in the future, he is still hopeful." This comment together with Prof. Wang's statement was put on the notice board in order to encourage other students.

Fifty years later Prof. Wang wrote in his memoir: "The admonition given to me from my father and teacher had an indelible impression on my young heart. Not only had I corrected my habit of telling lie, but also enabled me to be strictly honest in handling public affairs as well as in dealing with people in my life."

In 1920 Prof. Wang joined the Affiliated Middle School of National Normal University, a very popular school at that time. Traditionally, the students in Peiping had a deep interest in Peiping opera. Just spending 16 coppers, they were able to enjoy the afternoon performance at Kuang Ho Theater played by the students of famous Fu Lien Chen Peiping Opera School. Ma Lien Liang, a popular Peiping opera actor at a later date, was just graduated from that school.

Although Prof. Wang did make a great improvement in his studies, he, as most other students, still had a fervent love of Peiping opera. As a critic, he often wrote comments on opera for leading newspapers. In order to hide his secret from his father, Prof. Wang used "Tao Kung" or "Tin Li Kuan Chu" as his pen-names. His articles were so well-written that many of them were carried in other papers. In fact, this was the beginning of Prof. Wang's writing career. He continued his writings until he entered the Peiping Chaotung University. One day an article finished by him the

night before was inadvertently left on the desk and discovered by his father in the morning. Naturally, he was severely punished on this score, and this concluded his writing on Peiping opera comments.

Prof. Wang's father, Mr. Wang Chu (王倬), was a section chief of the navigation department of the Ministry of Communications at that time. His elder son, Wang Chung, Prof. Wang's brother, was graduated from Chao-tung University in Shanghai in 1923. The brilliant young man was appointed assistant to the Ministry's foreign advisor, Mr. Baker. Unfortunately, he died of pleurisy not long after. Sorrow-stricken on the death of his beloved son and aggravated by his chronic heart trouble, Prof Wang's father passed away at the end of 1926. He was 51.

Now the burden of supporting the family was put on Prof. Wang's shoulder. He said in his memoir: "After I have finished the funeral service of my father, I was immediately facing financial stringency of my family. My younger brother, Wang Chi, had just entered Chao-tung University in Tangshan. The exigent problem was how to get enough money to pay the tuition for two of us. Father was a good public servant; he had no savings. In the midst of my plight, thanks to some of my father's friends, I got a job of junior clerk in the Navigation department of the Ministry of Communications. I received a salary of 50 silver dollars a month",

In the meantime Prof. Wang continued his study at the Chao-tung University. Paradoxically, hardship to a young man is often a blessing. It becomes a litmus test of his strong

will and goads him to overcome seemingly insurmountable difficulties. Herein lies the difference between an ordinary man and a "superman". The former succumbs to misfortune, while the latter persistently defies it.

In 1928 at the age of 21, Prof. Wang completed his first book Chinese Navigation which was published by the Shanghai Commercial Press and included in the first series of the "Universal Library". In the summer of the same year the North Expeditionary Force of Kuomintang Party unified the whole country. Prof. Wang was promoted to a senior clerk in the navigation department of the new Ministry of Communications. Beginning January 1929 he was again appointed concurrently a member of the Committee on Statutes of the Ministry. He drafted "Statutes Governing Registration of Ships", "Enforcement Regulations on Maritime Law", "Rules Relating to Signs on Navigation Routes", "Regulations Governing Examination of Ships", "Detailed Regulations on the Enforcement of Law Governing Registration of Ships", "Statutes on Management of Maritime Personnel", "Piloting Law", etc. Owing to his meritorious service, he was promoted three times in 1930.

(III) Founding of "Journal of Communications"

In the middle of 1931, in view of Prof. Wang's outstanding achievements, the Ministry sent him to Hankow to do the preparatory work for the setting up of Hankow Navigation Bureau. Although his rank was only a division chief, he was ordered to shoulder the full responsibility of the mission. His excessive zeal soon invited jealousy from other quarters.

In autumn next year, Chen Ming-su, a general of the 19th Army famous for his sucessful resistance against the Japanese forces in Shanghai, became vice premier and concurrently minister of communications. Shortly after his assumption of duty, he fired many officials of the ministry and Prof. Wang was one of the victims. Being unemployed, he returned to Nanking. Suddenly, he got a brainstorm. The idea was to start a monthly magazine called "Journal of Communications". According to Prof. Wang: "Because of the lack of money, I spent two dollars to buy a small desk, to get a seal for the "Society of Journal of Communications" and to print some letter papers and envelopes for official use. My bed room was used as the office. I then sent out a number of letters to my friends requesting them to contribute articles for my magazine and promised them that the first issue would be out in October 1932. Luckily, I soon received many replies. Writings on navigation were done by myself. After the collection of articles enough for the first issue, the next problem confronting me was how to get the funds to defray the printing cost. With the help of my friend, a printing shop agreed to print the magazine first and settle the payment within one month after publication. In the meantime I printed 500 sheets of color advertisements to have them posted everywhere in Nanking. As an expediency to raise funds, I published without their permission in the first issue the time tables of all railways, and advertisements of communication agencies appeared in other magazines. When the first issue was out, it looked like a very hignly placed journal on

technical subjects. Most of the contributors were well known to the readers. It is true that "Well begun is half done". The auspicious start soon brought me a lot of subscibers and advertisers. Once and for all, I no longer worried about how to make two ends meet. The magazine's debut scored a wonderful success."

The start-from-scratch Journal of Communications had about 120 pages. I printed 2,000 copies for the first issue. The circulation eventually soared to 5,000 and it became one of the most popular magazines at that time. Altogether 58 issues were published regularly every month. It was discontinued after the outbreak of the Sino-Japanese War in August 1937.

(IV) To take up heavy responsibility at war time

In the spring of 1933 when the Journal of Communications had 5 or 6 issues, Prof. Wang was invited by the National Planning Commission to head the navigation section. He accepted the offer on three conditions: (1) He should have free hand to nominate his assistants; (2) If his service was considered satisfactory, he hoped to be sent abroad to take advanced study; and (3) He continued to be the publisher of the Journal of Communications. All these were readily concurred. As a result, he was sent to the United States to study navigation at the September of 1935. He returned to China 18 months later and was immediately appointed chief of ships section of the navigation department of Ministry of Communications. He was only a youth of 30 at that time.

When the Sino-Japanese War broke out in 1937, an

all-out war of resistance began. Prof. Wang was appointed director of Hankow Navigation Bureau in February 1938 taking charge of navigation affairs in Hupeh, Hunan, Kiangsi, and Szechuan Provinces.

In May 1938 the Chinese Supreme Commander decided to build a third blockade line in the rear of Ma Tang blockade line. This necessitated to scuttle the only 16 big ships then available for war-time transportation. Although this strategy could stop the Japanese warships from steaming up on the Yangtze River, it would be impossible to ship the 80,000 tons of machineries of Han Yang Arsenal from Hanyang to Ichang, let alone to transport other war supplies. In view of the situation, Prof. Wang suggested to build 4 cement ships to be scuttled instead of sinking the 16 useful steamers. After lengthy negotiation, his proposal was approved, but he was ordered to complete the cement ships within three months. According to the specifications, the cement ship was 80 feet in length, 24 feet in width, 12 feet in depth, with 2 square steel frames each of 20 feet in height and 10,000 kilograms in weight erected on the deck. On the eve of their completion in August, the water of Yangtze River suddenly rose to a very high level. Three cement ships already finished floated without any damage. The fourth one, because the super-structure was left undone, was submerged in the water. Prof. Wang immediately mobilized all the engineering staff to save the ship. A large number of pumps were used to get the water out. He did not sleep for two nights. Fortunately, the water stopped rising and

ten days later all of the 4 cement ships were handed over to military authorities.

These four cement ships served the purpose of blockading the river. More important, the 16 big steamers were thus saved so as to continue the water transportation in war-torn Central China. This was a significant contribution of Prof. Wang to military as well as to civil sectors.

(V) The establishment of mechanical winches to facilitate shipping

Right at that juncture, Prof. Wang was concurrently director of requisition of water transportation department of Chinese Military Commission. As lots of military supplies were stockpiled in Ichang waiting for shipment to Chungking, Prof. Wang commandeered all available ships to expedite transportation. However, because the current was so rapid, it was most difficult for ships to move upstream. Prof. Wang suggested to the Ministry of Communications to establish mechanical winching stations to facilitate upriver shipping. In October 1938 a Winch Administration Committee was set up with Prof. Wang as the chairman. With only a scanty sum of 10,000 dollars at his disposal, he eventually overcame numerous difficulties. Within a short span of three months, he established eight mechanical winching stations. In less than a year, up to June 1939, 571 steamships and 11,229 wooden ships were winched upriver. By saving countless manpower and materials, Prof. Wang made a great contribution to water transportation and dispersal plan at wartime.

(VI) To supervise the construction of wooden ships

In early 1939 when Prof. Wang was director of Yangtze River Navigation Bureau, the Ministry of Communications instructed him to carry out the wooden ships construction program. From February 1939 to March 1940, 219 improved type wooden ships totaling 5,172 tons were built.

The improved type of wooden ships had 8 advantages as follows:

(1) Body: Curvatures of the body were carefully designed to maximize the efficiency of displacement, loading capacity, center of buoyancy, rate of vertical and horizontal stability, etc.

(2) Structure: Structure was made to follow the regulations on wooden ships building promulgated by the Ministry. It had keels, ribs, vertical and horizontal beams and the planks were wedged together like dog's teeth. The construction work was firmly secure.

(3) Partition: Cabins were reasonably partitioned and waterproof. The upper part of each cabin was movable so that special cargoes could be kept to meet the wartime requirement.

(4) Deck: The deck was of slight slope type to facilitate easy drainage of water.

(5) Rudder: The cross section of the rudder was in curvature. It could be controlled handily. It was easy to keep the original direction in spite of very strong currents.

(6) Equipment: Equipment such as hook, winch, etc.

was well constructed according to detailed calculation.

(7) Speed: Owing to the handiness of the body and the light weight of facilities, the improved type wooden ship, compared with the old type ones of the same tonnage and same number of crew, had an increase of 30 per cent in speed.

(8) Convertibility: With a towable rod in the rear and a space for installing an engine, the wooden ship could be converted into a tug boat type steamer.

Other advantages were attractive appearance and durability. Ever since its completion, the improved type wooden ship became a wonder of wartime transportation widely acclaimed by the press.

(VII) A serious car accident almost took his life

In early September 1940 Prof. Wang was ready to return to Chungking from Kweilin after the completion of his official duties. At that moment the airplane fare of Eurasia Airlines suddenly made an increase of 100 per cent. For the purpose of saving public funds, he decided to take the trip by bus. Unfortunately, a serious accident happened between Chi Chiang and Chungking. Prof. Wang was badly injured. He narrowly escaped death sheerly due to his good luck. This testifies how loyal he was to his country.

(VIII) National interests were firmly protected

During his tenure of office as Director of Yangtze River District Navigation Bureau, Prof. Wang made a significant contribution to his country and people until the final stage

of the War of Resistance. In February 1945, he went to Canada and United States on an observation trip. When he returned to Chungking in October, he served the same position to start the rehabilitation work in the post-war period. Under his capable supervision, the lower part waterway of Yangtze River was soon cleared; night sailing was restored; wharfs in Hankow, Nanking, and Kiukiang formerly owned by foreign firms were taken over; and 10 public wharfs were built. Owing to his meritorious services, he was awarded during those years by the Government Order of Brilliant Star, First Class Superior Type Glorious Light Medal, First Class Navigation Medal, and Order of Victory.

One thing deserves particular mentioning was that Prof. Wang firmly protected the national interests by refusing the return of wharfs to Butterfield and Swire, and Jardine Steamship Companies in spite of duress and cajolery, thus frustrating the design of imperialist nations to infringe our navigation sovereignty.

(IX) A good better half

At the end of July 1949, when the war against the Chinese Communists was at an ebb, Prof. Wang took up the jobs of Director of Navigation Department of the Ministry of Communications and Director of Yangtze River District Navigation Bureau in a critical hour. The saddest thing was that in a disatrous fire on September 2 in Chungking, Mrs. Wang was killed. Five years later, he wrote in a very touching essay entitled "The Burning City":

"You saved Mother on my behalf enabling me to have discharged my duty as a son."

"During the period of War of Resistance, you rather chose to stay in the country to milk our baby and do the household chores. You bought meat only for me to eat; you did not want to make a dress with the rationed cloth; you became thinner and thinner; you looked tired and haggard."

"Your tenderness, your beauty, your kindness had won the praise of my friends, schoolmates, and colleagues. You made me happy in my early age, sustained me in my middle age; you gave me too much; I owe you a lot."

Two years later, Prof. Wang established a happy family again in Taiwan. the new Mrs. Wang, nee Young Chun-ju, is an intelligent and beautiful lady. She has been helping him greatly in Prof. Wang's old age.

(X) Nine years with Taiwan Navigation Company

Beginning January 1959 Prof. Wang became board chairman of Taiwan Navigation Company. For nine years, as above-mentioned, he declined the offer of having a car for himself. Believe it or not, he was the only board chairman of a great government-owned enterprise who went to office by bus.

After two years of his chairmanship, a new era of the Company dawned. His optimum planning brought it a wonderful success. The debt-torn Company was no longer in

the red. The press even termed it as a "miracle". In 1958 TNC recorded a net loss of NT$32,955,919, but it registered a net profit of NT$11,470,595 in 1960.

When he retired in 1968, the staff of TNC presented him a silver plaque in honor of his distinguished leadership.

(XI) Model of intelligentsia

After his retirement at the age of 62, Prof. Wang has been devoting himself to writing and teaching. During the past sixty odd years in his life, he was haunted by many misfortunes. He lost his father in his youth, lost his beloved wife in his middle age, and was almost killed by a car accident. But the unfortunate "fate" has never overpowered him. Instead, it created a glorious life for him. The three "immortals" traditionally pursued by Chinese scholars are "to establish one's merit", "to establish one's virtue", and "to establish one's words". Prof. Wang has undoubtedly established all of these three imperishable features of a scholar. He is, in fact, a good model of Chinese intelligentsia. (Maritime Quarterly, April 1972)

CHRONOLOGICAL ACCOUNT OF PROFESSOR WANG KUANG'S CAREER

EDUCATION:

Sept. 1924–June 1928 National Peiping Chao Tung University, Department of Transportation Administration

Sept. 1935–June 1936 Graduate School, Pennsylvania University, U.S.A.

Feb. 1945–Oct. 1945 Sent by Government to Europe and U.S.A. to study wartime navigation and ocean transportation

May 1971 Honorary doctorate degree, the China Academy

HONORS (Awarded by the Chinese Government):

1946–1948 Order of Brilliant Star
First Class, A Type, Kuang Hua Medal
First Class Navigation Medal
Order of Victory

PUBLIC SERVICE:

I. Administration

Nov. 1926–July 1928 Junior clerk, Navigation Department, MOC

Aug. 1928–June 1931 Clerk, Navigation Department, MOC

Jan. 1929–June 1931 Member, Laws & Regulation Committee, MOC

July 1931–June 1932 Division Chief, Hankow Navigation Bureau, MOC

April 1937–Jan. 1938 Division Chief, Navigation Department, MOC

Feb. 1938–Aug. 1941 Director, Hankow Navigation Bureau, MOC

Sept. 1941–July 1949 Director, Navigation Bureau, Yangtze River Area, MOC (Concurrently Chief, Hankow, Ichang, & Hunan Area; National Pilot Administration Committee)

Oct. 1938–Dec. 1943 Chairman, Upriver Winch Administration Committee, MOC

Aug. 1949–Feb. 1951 Director General, Navigation & Civil Aviation Department, MOC

Jan. 1950–May 1950 Concurrently Director General, Railway & Highway Department, MOC

Mar. 1956–1958 Adviser, MOC

II. Planning & Research

July 1934–Mar. 1937 Research Fellow in charge of Navigation, National Defence Committee

Mar. 1951–Dec. 1958 Member, Planning Committee, MOC

Jan. 1955–Dec. 1958 Research Member, Research Institute of Communications, MOC

Nov. 1957–Dec. 1966 Member, Water Transportation Sub-Committee, Mainland Recovery Planning Commission, Executive Yuan

Aug. 1959–Dec. 1961 Member, Technical Standard Committee, MOC

Apr. 1962–Dec, 1965 Chief, Communication Section, Economic Mobilization Planning Commission, Executive Yuan

June 1963–Dec. 1966 Chairman, Screening Committee on Maritime Affairs Terminology, MOE

Jan. 1962–Dec. 1969 Member, Screening Committee on Navigation Laws & Regulations, MOC

III. Military Transportation

July 1938–Nov. 1938 Director, Requisition Department, Water Transportation Command, National Military Council with rank of a major general

Sept. 1941–Oct. 1944 Chief Commander, Szechuan Water Transportation Regiment, National Military Council

Jan. 1950–May 1950 Member, South East Sea Navigation Committee, South East Military and Civil Officer's Office

IV. Ship-building

May 1938–Sept. 1938 Chief, Laboratory on Reenforce Concrete Ship–building, MOC

Nov. 1939–Feb. 1943 Director, West River Ship–building Bureau, MOC

Jan. 1941–Feb. 1943 Director Szechuan River Ship–building Bureau, MOC

Mar. 1943–Feb. 1944 Director, Ship–building Bureau, MOC

V. Navigation Enterprises

Dec. 1949 Director, Central Airlines Corp.

Feb. 1950–Dec. 1950 Director, China Oil Tankers Co.

Sept. 1949–Mar. 1962 Director, China Merchants Steamship Navigation Co.

Jan. 1959–Feb. 1968 Board Chairman, Taiwan Navigation Co.

VI. Education

Dec. 1950–Apr. 1954 Examiner, Special Examination for Navigation Personnel

Sept. 1962–Sept. 1967 Assistant Examiner, High Examination

Aug. 1935–July 1936 Professor, Military Communications Research Institute, National Military Council

Sept. 1939–June 1943 Professor, National Chungking Merchant Ship Institute

Sept. 1942–Feb. 1945 Professor, National Chao Tung University

Sept. 1956– Professor, Provincial Maritime College

Sept. 1956– Professor, Chengkung University

June 1954–June 1963 Professor, Institute of Political Cadet

Feb. 1959– Professor, National Chengchi University

Oct. 1959– Professor, Ming Chuan Girls Institute of Commerce

Sept. 1960–Aug. 1970 Professor, Ta Tung Engineering College

Sept. 1960– Professor, Tamkang College of Arts and Sciences

May 1960–Jan. 1972 Lecturer, National War College

VII. Academic Associations

July 1962– President, China Maritime Institute

Incumbent Executive Director, China Corporation Register of Shipping

Incumbent Director, China Local Government Society

Incumbent Director, Research Society of Dr. Sun Yat-sen's Teachings

Incumbent Executive Supervisor, Chinese International Trade Association

Incumbent Director, Research Institute of Oceanology, Chinese Culture College

Incumbent Director, China Communications Reconstruction Society

VIII Publication

Sept. 1932–July 1937 Founder, Communications Magazine
Nov. 1951– Founder, Maritime Publishing Company
June 1964– Director, Taiwan Commercial Press, Ltd.

PART II

Free China Honors Professor Wang Kuang on Navigation Day

Taiwan Navigation Company's Crucial Battle for Survival

FREE CHINA HONORS PROFESSOR WANG KUANG ON NAVIGATION DAY

The China Maritime Institute, an educational and marine research organ financed by Chinese shipping circles at home and abroad, held its anniversary meeting at 9:30, yesterday, in the CMI building, on the occasion of the Navigation Day. The meeting was to mark its 3rd anniversary and the 40 years' continued service of its Director Wang Kuang.

The highlights of the meeting were a speech given by Shen Yi, Minister of Communications, the presentation of the artistically designed membership emblems, the formal acceptance of Wang Kuang's donation in books on marine navigation either written by himself or others, the establishment of the "Wang Kuang Navigation Scholarship Fund" donated by the Hong Kong Navigation Association, and the granting of the "Wang Kuang scholarships" among the country's hopefuls.

The 2-hour meeting presided over by Wang Kuang and Wang Chi-hsien was attended by more than hundred members and guests. In his address Minister Shen emphasized the importance of maritime navigation and made a brief statement about the shipping conditions in China.

During the past four years, Shen said, the tonnage of China's merchant ships has been increased from 500,000 tons to 880,000 tons; the transportation capacity upped from 2,800,000 tons to 4,990,000 tons; the average speed of ships

increased from 11.4 to 13.8 nautical miles per hour; and the average age of ships increased only from 14.7 to 16.2 years.

In the past, considerable space of local newspapers has been devoted to the reporting of Wang's lifelong service in promoting maritime navigation in China as well as his feat in saving the Taiwan Navigation Company from going bankrupt.

In fact, Wang celebrated his 60th anniversary barely 4 days ago. He is known as the "Master of Chinese Navigation" or as others called him "the Shipping Ambassador". He began his career as early as 1928 in the Ministry of Communications.

Since then, by dint of hard work and sheer ability, he has climbed to the top of the ladder of success. He held many top posts in the realm of maritime navigation and shipbuilding and was the director of the Department of Navigation and Aviation under the Ministry of Communications up to 1951. He is now chairman of the board of directors of the Taiwan Navigation Company. Meanwhile, he is busy in bringing up young navigators by teaching in a number of colleges and universities in Taiwan.

He is one of the founders of the China Maritime Institute and by popular voting became its director three years ago. Under his able guidance, the institute has been quite active in sponsoring various navigation research projects, in publishing literatures dealing with navigation and marine transportation, and fostering young needy students by means of scholarships.

In the institute, a library with more than 20 thousand

reference books and valuable writings has been set up from the donations of Wang and other. Wang is also the author of 40 books on navigation, a coincidence of his 40 years' service.

As the chairman of the board of directors of the Taiwan Navigation Company, when the company was facing bankruptcy in 1957, he was responsible for helping the concern stand on its feet. After less than a year, the shipping company was no more in the red; and in two years it began having favorable balance. Thus, Wang has every reason to be proud of himself in winning the battle for rejuvenating the debt-ridden TNC. (The China News 7/12/1965)

TNC'S CRUCIAL BATTLE FOR SURVIVAL

By D. J. (China Post)

Year in and year out for almost ten years the Taiwan Navigation Company, Ltd. of the Taiwan Provincial Government had been operated in red. The only difference between one year and another during this period was that the Company suffered greater loss in every succeeding year than the previous one. The culminating effect of all the losses reached its climax in the latter part of 1957 when the financial state of the Company more than justified a declaration of bankruptcy. In the face of this desperate situation, the Taiwan Provincial Government had to make a decision between a complete shutdown and reorganization of the Company with better talent and more government subsidy. For obvious reasons, the latter course was chosen.

It goes without saying that the reorganization of the Company is only possible when the government can find the right man, who has the confidence of the authorities of not only being a man of integrity but also one who is capable enough to assume the great responsibility in an undertaking that requires expert knowledge, to be the chairman of the board of directors of this shipping concern—the only one of its kind operated by the Taiwan Provincial Government.

It did not take the authorities to do much talent-scouting before they decided upon the choice of Mr. Wang Kuang, one of China's foremost authorities on transportation, to fill this responsible position.

In something like half a year after Mr. Wang Kuang had taken over the duties as Chairman of the Board of Directors of the Taiwan Navigation Company, this shipping concern was no more in the red. Today, one year and a half later, this Company is proud of the fact that it can show a favorable balance. Due credit should go to Governor Chow for his wise decision in the choice of the right man, the Commissioner of Communications, Mr. Y. C. Tang, for his able directorship and the General Manager, Mr. S. K. Chen, for his efficient management.

"How could you manage to achieve so much within so short a time?" I asked one of the executives of the Company.

"Because the Company is managed and operated on the basis of two cardinal principles of economy," answered the official tersely.

"What are the principles?"

"Reduction of overhead expenses to a minimum on the one hand and better utilization of the Company's resources to ensure more income on the other."

General Manager Chen Shuen Ken's report to the Provincial Assembly on November 11, 1958 and TNC's bulletin on the conditions of the Company between July, 1958 and June, 1959 gave a graphic account of the achievements and progress made by this Company. For the purpose of retrenchment, the Company has taken drastic steps, the most outstanding of which are as follows:

1. Branch offices in Japan, Hongkong and Hwalien have been abolished.

2. All transportation facilities of the Company for the executives (including the Chairman of the Board of Directors) and staff members have been dispensed with. Instead they are provided with bus commutation tickets.

3. The Company has terminated the services of 99 members of the staff and the employment of 40 workmen.

4. Salaries of executives and staff members and wages of workmen are to be paid at 20 per cent discount.

Positive measures have also been adopted to enable the Company to be operated more profitably, such as the establishment of permanent sailing schedule between the U.S.A. and Taiwan, between Japan and Taiwan and between the Philippines and Taiwan.

To all intents and purposes, TNC has won the first round in a crucial battle for survival. No one has better reasons to be proud of the achievements of the TNC than its Chairman Wang Kuang, who is not only an experienced executive and administrator but an expert on transportation. Incidentally, he is the author of more than 40 books on affiliated subjects concerning transportation. Some of them are being used by several colleges as textbooks. Mr. Wang also realizes more than anyone else that the problems of TNC are by no means over. In the commercial world where competition is keen, there is a long way to go before TNC is good enough to compete with other better equipped shipping concerns. In the meantime, TNC's foundation is none too good. Their 10,000-ton ships have a speed only a little over 10 knots. Consequently, it is not a paying proposition for

such ships to go farther than the west coast of America. For a longer distance, ships of 15,000 tons with a speed of 16 nautical miles or more per hour are the minimum requirement. The executives of TNC share my views that it is imperative for them to build sooner rather than later two more 15,000-ton ships good enough to make 16 knots, without which the future of this government-operated shipping concern will be anything but optimistic. Whatever measures may be introduced to improve the efficiency of the management and how great sacrifices the personnel of the Company may be prepared to make will not help the Company surmount the kind of difficulties that concern the quality of the ships.

Since the Taiwan Provincial Government has made the wise decision in adopting necessary measures to help TNC win the first round in the battle for survival, it is a matter of great urgency that something be done to provide the Company with a more solid foundation, which is only possible when new ships are built and old ones modernized. In any battle, it is the last round that counts. The government should be convinced by now TNC has done everything humanly possible to win the first round. What chances TNC has in winning the last round depends more upon the decision of the government in building more ships than any efforts of the Company. (China Post, 12/29/1959)

PART III

The Trend of World Shipping Industry

Welcome our Friends from "World Campus Afloat"

THE TREND OF WORLD SHIPPING INDUSTRY

by Prof. Wang Kuang

A speech made at the Second World Chinese Shipping Amity Conference held in Bangkok, Thailand, on November 21, 1969.

The Presidium asked me to make a report on the trend of worldwide shipping. I quite hesitate in accepting the request because my knowledge on the operation of shipping business is much less than you have and the request was made unexpectedly that there is little time for preparing the report. However, I wish to take this opportunity to present some of my opinion for your reference.

First, the rapid increase of international trade promotes the development of shipping industry. International trade depends largely on the shipping service. The shipping industry has also to rely heavily upon the international trade. Therefore, international trade and shipping industry are closely related—a fact which I think all of us here are fully aware of. According to the data I have on hand, the total amount of cargo carried by ships in 1965 reached 1,602 million tons which is 617 million tons more than in 1959. Therefore, the number of ships also has increased considerably. In 1965, the total tonnage of ships over 1,000 gross tons in the world was 160 million tons. On the average, each 10 tons of cargo need the service of one ton of ship. According to the statistics of June of last year (1968), the total tonnage of the ships in the world has reached 1,756 million tons. Although I

have no data on hand with regard to the amount of international trade during the corresponding period, it seems that the increase of merchant ships fails to catch up with the requirements of international trade, especially in the respect of oil tankers. That all the harbors in the world have constantly been crowded with merchant ships is sufficient to indicate the prosperity of the shipping industry.

Secondly, as the international trade in Asian region is highest in the world, the prospect of the Asian shipping industry is very bright. The total amount of international trade reached 1,602 million tons in 1,965 among which the amount in the Asian region is the highest, 531 million tons of cargo; European the second, 334 million tons; North American the third, 277 million tons; then the Latin American, African and Australian regions. The Asian international trade has become very prominent because the economy of the Asian nations, such as Japan, Thailand, the Republic of China, Korea, Philippines, Malaysia and Singapore are being expanded rather fast. From 1961 to 1965, on the average, the rate of economic growth of the Republic of China is 9.7 percent; Japan 9.6 percent, Korea 7.1 percent; Thailand 6.9 percent. The rates of economic growth of these Asian nations are higher than the 5.2 percent of Italy, the 4.9 percent of Western Germany, the 4.7 percent of America, the 4.6 percent of Australia, and the 3.3 percent of England. From the stand point of the Asian people, more responsibility should be assumed and more cooperation is needed with respect to the international trade and shipping operation in the Asian

region. In other words, the prospect of shipping business operated by the Asian people is very bright and joint effort of all Asian nations in this regard is highly worthwhile.

Thirdly, the operation of passenger service tends to be popularized. Since the development of civil aviation industry, the passenger service of merchant ships has been shifted to tourists. In order to compete with the airplanes and buses, the speed of passenger ships need be increased, accommodation facilities modernized, class unified and ticket fare reasonably lowered. For the operation of scheduled passenger shipping service, the tonnage of the ship is preferable not to exceed 58,000 tons, the tonnage of the Queen Elizabeth II, so that the ship can pass through Panama Canal and Suez Canal to shorten the voyage.

Fourthly, bulk carriers will be the main force of non-scheduled shipping operation. The biggest cargo sources for non-scheduled shipping operation are grain, coal, iron ore, fertilizer, salt, and sugar. Most of such transportation is for single voyage and the return voyage is usually made without carrying any cargo. If conventional ships are used for such service, the ship tonnage is considered not large enough to get any profit. After the Second World War, the bulk carriers are developed and used solely for such kind of transportation. Since the bulk carriers meet the requirements of economic shipping operation, the number of such ships has been increased as rapidly as the oil tankers. As of March of this year (1969), the total tonnage of such ships has reached 59.2 million tons. The tonnage of such ship is 16,000 tons

for the smaller ones, and is 70,000 to 80,000 tons for the bigger ones. Since the economic situation of various countries is continually developed and industrialization is still under progress, the cargo sources for bulk carriers will still be constantly increasing. Our shipping industry in operating non-scheduled shipping service needs to face such fact. In order to gain more profit, the number of ships should be increased, and attention should be paid to the construction of large ships and the replacement of small ships with larger ones.

Fifthly, container ships will be the main force of scheduled shipping operation. The merit of container ship is the saving of loading and unloading time. It will also faciliate the operation of water-land joint transportation and lessen the loss and damage of cargo during transportation. Therefore, the container ships are greatly welcome by industrial circles and will be the main force of the scheduled shipping service in the future. According to the statistics of January of this year (1969), there are 29 container ships under operation, with a total of 246,000 ton carrying capacity. At the same time, 54 container ships totalling 1 million ton carrying capacity are under construction and expected to be completed this year or in the next year. If the operator of scheduled shipping service does not follow this trend of development by building and operating container ships, he will have difficulty in getting cargo of high freight rate. The trading of certain cargo may be made even on condition that the cargo must be transported by container. Our shipping industry should

meet such trend of development and proper planning be made well in advance.

Sixthly, "Lighter aboard ship" is a promising invention. In the past three years, United States and Japan have developed a kind of lighter aboard ship, known as LASH, which carries on board lighters which themselves are loaded with cargo. Lighters loaded with cargo are lifted on board by big cranes, and at the destination are again discharged from the ship and lowered to the water by cranes and then are driven direct to the cargo consignee. This kind of ship is convenient when the harbour is crowded or space limited. It is particularly convenient when the depth of the harbour is not ideal that big ship is not easy to sail in. Our shipping industry should take the development of such lighter aboard ships into consideration, and if possible, try to adopt such ships into service to see how efficient they will be.

Seventhly, automation of ship operation has great economical value. In traditional maritime countries, the wages are rather high, and in order to reduce the crew and still be able to operate the ship efficiently, automation by using electronic facilities has been widely adopted. Automation saves manpower and is safe. Take the oil tanker as example. The crew number of larger tanker is not necessarily be more than that of small tanker, and after adoption of automatic control, may become less. For instance, on the 16,000 ton T-2 tanker which was built during the Second World War, 51 operating crews are required. And the 150,000 ton

Tokyo Maru requires only 21 persons to operate. The 220,000 ton tankers which are recently built by Mr. C. Y. Tung, the shipping industry tycoon of our country, needs only 41 operating persons on board. You can easily figure out the great economical value and efficiency of such modern tanker.

As time is limited, I am able only to give a report on several main issues. Since all of you are well experienced and successful operators, your comments will be highly appreciated. Thank you.

WELCOME OUR FRIENDS FROM "WORLD CAMPUS AFLOAT"

By Prof. Wang Kuang

It is a great pleasure for me today, on behalf of the China Maritime Institute, to welcome the distinguished personages of the "World Campus Afloat" the success of which has already been known all over the world. As my son, Wang Hsuan (王煊) is now working on the Campus, I feel particularly cordial and happy in meeting our honorable guests in the Republic of China.

During the past six months, my son has written twenty six articles reporting various activities related to the education on the Campus and its round-the-world-voyage. These articles have been published from time to time in the Central Daily News and the United Daily News, two leading newspapers in this country. These articles were also reprinted in the "Maritime Quarterly" published by our Institute. I have brought here a few copies of the "Maritime Quarterly" and will present them for your reference.

On account of the constant reporting in these two mass-circulated newspapers, the unique educational system of the "World Campus Afloat" has been well understood in the Republic of China, particularly appreciated by the educational and shipping circles.

The Chinese college students are most interested in this program, and many of them hope that someday they may have a chance to receive the education on the "World Campus

Afloat", to travel all over the world, and to meet the people in various countries so as to promote international understanding and cooperation.

I am now teaching at the Taiwan Provincial Maritime College in Keelung. In this College, besides other Departments, there are Navigation Department, Marine Engineering Department and Shipping Management Department. The students of these three departments are best qualified to receive on board training to learn various technical know-how and also to practice. To practice on the well-equipped "Universe Campus" passenger liner is far better than doing the same on an ordinary training ship. Therefore, I would like to suggest that these three courses be added to the curriculums of "World Campus Afloat". Not only the Chinese students will love to take these courses, many students of the U.S. maritime institutions, I believe, will also be deeply interested in them.

According to the maritime educational system in the Republic of China, the students of navigation department and marine engineering department must receive on board training before graduation. If such a training could be made on the "World Campus Afloat", it would save time and achieve better results. I think Mr. C. Y. Tung, one of the world shipping magnates will support my proposition.

I hope you will enjoy your stay on this beautiful island, and find the trip profitable and rewarding. Thank you.

(April 28, 1972)

PART IV

Water Transportation During Sino-Japanese war

The Rising Shipping Industry in Free China

Development and Modernization of Shipping Industry in the Republic of China

Progress Towards the Ocean

Transportarion in Taiwan in Last Fifteen Years

Transportation Economy of Today

Chinese Sailing Vessels

WATER TRANSPORTATION DURING SINO-JAPANESE WAR

by Prof. Wang Kuang

The Twenty-Sixth Year of the Republic of China

(1937)

1st April Sino-Japanese relations were in an exceedingly tense state and the outbreak of war could occur at any time. As requested by Yu Fei-pon (俞飛鵬), the Minister of Communications, I was transferred from the National Defense Planning Council to Ministry of Communications. I was appointed as the Chief of Ships Section and the Chief of Maritime Section. Lu Han-Ching (陸翰芹) was the Director of Navigation & Civil Aviation Department at that time.

7th July War of Resistance began with the Japanese troops shooting at Marco Polo Bridge (蘆溝橋). The Japanese launched an surprise attack at Wenping Hsien (宛平縣) near Peiping and the attack was met with severe resistance of our forces.

1st August National Military Council ordered that various Ships Regiments be established in provinces or cities with the Chief of Provincial Construction Department or Chief of Engineering Bureau acting as the chiefs of such Regiments. The primary responsibility of Ships Regiments was to investigate, organize, examine, and control all the ships under its jurisdiction, for use in military transportation.

11th August Ministry of Communications ordered all

the steamship companies to consolidate their vessels in the Yangtze River, Hongkong or other secure harbors in order to avoid capture and utilization by the enemy. Those that could not make the move were allowed to change their nationality, so as to remain at sea for maintaining the coastwise service.

12th August To form the first blockade line in the Yangtze, S. S. "Chiaho", "Hsinming", "Tunghwa, "Yushun", "Kwanglee", "Taishun" and "Kungping" of the China Merchants Steam Navigation Company (招商局), sixteen private owned vessels, warships and twenty-eight receiving lighters were gathered and sunk so as to blockade Changshan harbor (長山港) below Kiangying (江陰). Ships in the Yangtze River sailed down to Chenkiang (鎭江) only.

Japanese ships "Yuehyang" (at a gross tonnage of 3,298) and "Tatseng" (at a gross tonnage of 1,369) of Jeiching Steamship Company were captured at Nanking as they had no chance to run away. These two vessels were immediately taken over by me and a group of sea-men and turned over to CMSNC and renamed as "Kianghan" and "Kiangshieng". It was the first booty since the war began.

25th August The enemy declared blockade of the harbors along the China Sea coast from Chinwangtao (秦皇島) in the North to Peihaikou (北海口) in the South. Vessels, warehouses, receiving lighters and small steamers of the Jeiching Steamship Company along the Yangtze River were all taken over and used by our military organizations.

August Executive Yuan declared Regulations For

Transfer of Ships Into Foreign Nationality During Wartime, permitting sea-going vessels not yet evacuated into the Yangtze River and other merchant ships taking shelter at Hongkong or overseas be transferred into the nationality of neutral countries temporarily. One hundred and thirty ships with a total tonnage of 145,000 were approved for transfer. Eighteen vessels were transferred into the nationality of Italy, seventeen vessels into Germany, thirty-seven vessels into Portugal, sixteen vessels into Greece, seven vessels into Panama, three vessels into Norway, two vessels into Holland, five vessels into Britain and more than twenty vessels into other nations.

1st September By the order of the Minister of Communications, Yangtze River Navigation Combined Office was organized by various shipping concerns, so the ships could be consolidated for use in civil and military transportation. With the same purpose, order was given to shipping guilds at various ports to organize the Inland River Navigation Joint Office. Such offices were consecutively set up at Shanghai, Chenkiang, Wuhui (蕪湖), Kiukiang (九江), Hankow (漢口), Changsha (長沙), Foochow (福州) and Amoy (厦門).

Jointly with Senpa, Mingsheng, Tateh and Tatung shipping companies, CMSNC rendered a service from Shanghai to Chenkiang. It made its way through inland rivers from Jeihweikong (日暉港), Shanghai to Chenkiang, then turned its way to Nanking. All the manufacturing equipment could be moved up to the interior in the shortest

time. The gigantic work was done by Yang Kuan-pai (楊管北) (the Joint Office Chief of Tateh and Tatung ships companies), Lee Ching Lu (李景潞) Chang Tze-kai (張茲闓) and Lin Chih-yong (林繼庸) who were assigned by Central Government to handle that movement.

12th September The Yangtze River Business Office of CMSNC was established at Nanking headed by Shen Chung-yi (沈仲毅), Vice President of the Head Office of CMSNC. He was responsible for directing the Yangtze River vessels and handling civil and military transportation.

19th September Tientsin (天津) Navigation Administration was shut down.

October Haichow (海州) Office, Ninpo (寧波) Office and Wenchow (溫州) Office under the directorate of Shanghai Navigation Administration were shut down. Foochow (福州) Office and Amoy Office under the directorate of Kwangchow (廣州) Navigation Administration were also shut down. As a business requirement, all the offices, except Haichow Office, were restored directly under the directorate of the Ministry of Communications in next year. Wang Chi-hsien (王濟賢), the CMSNC's Chief in Foochow, was appointed concurrently as the Chief of Foochow Office. For years, he had kept abreast of the times in opening the harbors in Fukien (福建) Province and controlling the entry of alien ships. The harbors Siachen (沙埕), Senkiangkuo (三江口), Hankiangkuo, (涵江口), Chingkiang (晋江), Tungshan (東山), Chuanchow (泉州), Shinghua (興化), Sentou (三都), Kankiang (蚶江), Yingning (永寧), Shenghu (深滬), Fooching (福清),

Shiengtze (祥芝), Kuofookong (古浮港), Loyuenwan (羅源灣), Shuishenyu (秀山嶼) and Shiachu (蕭厝) in Fukien Province had been opened to alien ships for import and export during the war.

8th Nov. The south railway station of Shanghai fell into the hands of the enemy. Shanghai Navigation Administration was shut down.

12th Nov. Our forces evacuated from Shanghai. After the evacuation, the President of CMSNC, together with portion of his staff, set up an office in Hongkong. Simultaneously all the CMSNC's property was turned over to William Hunt & Co. in name, on a two-year contract that entitled them to draw 3% out of the total income monthly.

16th, Nov. The Government started to move to Chungking from Nanking as the war against Japanese in Shanghai had turned for the worse. The business was undertaken temporarily in Hankow.

16th Nov. Both Chenkiang and Wuhui offices of the Shanghai Navigation Administration were shut down. Kiukiang Office of the Hankow Navigation Administration was also shut down. Kiukiang office was reestablished again in the next year, and it moved to Chian (吉安) when Kiukiang was no longer in our hands.

13th, Dec. One week before the evacuation of Nanking, the last batch of officials of Ministry of Communications and other ministries of the Central government, together with their files and documents, left for Hankow on the S. S. "Kianghan". I, being assigned by Ministry of Communications,

took care of the movement to Hankow, and from there, further arrangement was made to Chungking and Changsha.

20th Dec. Eighteen commercial vessels, with a total tonnage of some 24,900 and a group of boats with full weight of gravel were gathered and sunk at Matang (馬當), on the Yangtze River to form blockade line for preventing the enemy ships from sailing up river. Chang Hsi-sou (章錫綬) conducted the construction. Ships in the Yangtze River sailed downward to Kiukiang only.

31st Dec. Changsha Office of Hankow Navigation Administration was shut down, to be restored again in April of the next year.

The Twenty-Seventh Year of The Republic of China (1938)

1st Jan. Ministry of Railway and Ministry of Communications were merged. Minister of Communications Yu Fei-pon was designated as the commander-in-chief of Hqs. Service of Supply. Minister of Railway Chang Chia-ngao (張嘉璈) was designated as the Minister of Communications. Peng Shieh-pei (彭學沛) was appointed as Political Vice Minister and Lu Cho-foo (盧作孚) as Administrative Vice Minister. Ho Mou-ling (何墨林) succeeded Lu Han-ching as the Director of Navigation & Civil Aviation Department, upon the latter's resignation.

1st Feb. The area of Hankow Navigation Administration covered Hunan (湖南), Hupei (湖北), Szechuan (四川) and

Kiangsi (江西) provinces, playing a major part in military and civil transportation. I was designated as the Director of Hankow Navigation Administration. As directed, Kiukiang Office and Changsha Office were reestablished. The Yangtze River Business Office of CMSNC was removed to Hankow. Twenty one vessels which had been evacuated to the middle part of the Yangtze River maintained services between Hankow and Ichang (宜昌). They were also used for sailing in the lines: Hankow–Changsha, Hankow–Changteh (常德), Chengteh–Tsiengshih (津市), Changteh–Taoyuen (桃源) and Kiukiang–Nanchang (南昌). Vessels of private concerns were taking part in the respective line as directed by Navigation Administration.

March Kwangchow became the only harbor for import and export, all the harbors along the coast and Yangtze River being either blockaded or lost to the enemy. Canton–Hankow Railway and Kwangchow–Kowloon Railway were busy in military transportation, leaving little capacity to carry civilian goods, food, import and export materials. The situation was gradually improved by way of combined water and railroad service in three sections. Cargo was transported from Hankow to Hengyang (衡陽) or Lukuo (淥口) by vessels. From there, it was carried by train to Chukiang (曲江) or Yinteh (英德). Finally it reached Kwangchow by vessels again. Foreign trade was gradually flowing.

1st April War–time Administration and Training Committee for Jobless Communications Personnel was established to take care of all the administration and training work for

jobless personnel. Pang Kwang-chiung (潘光迥), the Director of General Affairs Department and Chi Yuen-pu (季源溥), the Chief of Labor Section, were taking care of the matter concerned. Chi was concurrently appointed as the Chief of the Communications Service Group. Jobless seamen, river-pilots and seamen discharged from Japanese vessels were to be placed for training and reemployment. Some of them were paid and dispersed.

29th April Lien-yun Harbor (連雲港) at the Haichow-Lanchow Railway was destroyed by our forces in order to avoid utilization by the enemy.

May As the 3rd blockade line in the Yangtze River, sixteen vessels were planned to be used for sinking at Tienchiacheng (田家鎮). The Ministry of Communications proposed to replace these vessels with four gigantic reinforced concrete vessels. This proposal was approved and they were built in time. The Reinforced Concrete Vessels Tentative Office was directed by me as my additional job besides my post as Director of the Hankow Navigation Administration.

17th June Nanchang-Kiukiang Railway was shut down by taking off its rails. Ministry of Communications ordered CMSNC to replace the railway transportation with water transportation between those two places. Nanchang office and Wucheng (吳城) office were set up. Piers being rented, vessels and hulks being prepared; they started their services immediately. There were five vessels from private concerns taking part.

30th June The enemy suddenly penetrated Matang

fortification.

1st July With an urgent need of military transportation to support the campaign in Wuchang–Hankow area, Ships Transportation Hqs. was established in Hankow. Yu Fei–pon, the Commander–in–Chief of Hqs., Service of Supply, was appointed concurrently as the Commander of that Hqs. and I concurrently as the Chief of its Gathering Department. I was responsible for directing the Subordinate Ships Control Office and various provincial ships regiments in handling military transportation.

18th July Haimen (海門) of Chekiang (浙江) province was opend to alien vessels for commercial purpose. Following that, the other ports in Chekiang province such as Shepo (石浦), Ngaochiangkou (鰲江口), Feiyuenkiangkou (飛雲江口), Chingkiangkou (清江口) and Linghai (臨海) were temporarily opened during the war to alien vessels to faciliate import and export.

July Some 2,200 tons of rails had been taken off from Nanchang–Kiukiang Railway and equipment was shipped to Changsha from Kiukiang on the vessel "Haishiang". It was the first time that a sea–vessel sailed in the inland rivers.

September Situation around Wuchang (武昌) Hankow became critical. All vessels were directed to evacuate to the upper part of the Yangtze River: two hundred and eight vessels to Ichang, eighty vessels to Changsha, and more than twenty vessels to Changteh. All river–pilot personnel evacuated to Ichang.

19th Oct. Ministry of Communications ordered Hankow

Navigation Administration to establish Committee for Administration of Winching Statons in Ichang. I was appointed concurrently as the Chairman of the Committee, and Tseng Pei-Kuan (曾白光), Chief of Ichang Office, as the Vice Chairman of that Committee. Installations were set up in all the shoal sites, such as: Chingtang (青灘), Shetang (洩灘), Shinlungtang (興隆灘), Tatung (塔洞), Tungyangtze (東洋子), Qungtzeko (滾子角), Nuiko (牛口), Muichihtze (廟基子). Instead of manpower, machine was used to haul up the vessels. More than a hundred big and small vessels passed over the whirlpool and safely reached Szechuen by means of these installations. (See "The Establishment of Winching Stations" of "Policy on Navigation" written by me).

19th Oct. Shanwei (汕尾) of Kwangtong province was opened as a commercial port to alien vessels. Consecutively, Shenchuen (神泉), Kwanghai (廣海), Yangkiang (陽江), Tienpei (電白), Huengpo (黃坡), Suangchi (双溪), Taokang (島坎), Tsingchow (井州), Shuitung (水東), Fanhou (範和) were opened to alien vessels temporarily during the war.

21st Oct. Our forces evacuated from Kwangchow.

25th Oct. Our forces evacuated from Wuchang and Hankow. Hankow Navigation Administration removed to Chungking and I stationed there. Chungking Office was removed to Luhsien (瀘縣).

26th Oct. Kwangchow Navigation Administration was removed to Wuchow (梧州). Vessels in Pearl River (珠江) were all evacuated to the ports above Kiangmen (江門) and

Chaoching (肇慶). Lu Feng-ta (盧逢泰), the Director of Kwangchow Navigation Administration, took care of evacuation. Chaoching Office was established and headed by Chang Yi-ping (張益平).

24th Nov. In order to furnish transportation in the area where no railway and steamships facilities were available, the Horse-back Transportation Unit was established.

November After the evacuation of Wuchang-Hankow, all the personnel, military materials and commodities, (over 130,000 tons) were concentrated in Ichang. Shipping was difficult owing to low-water at that time. Hasty transportation was rendered by Ming Sheng Enterprise Company, one of the biggest navigation business organizations in Szechuen River (川江), which made its efforts in consolidating a great number of vessels sailing between Ichang and Wenhsien (萬縣). In the meantime, one thousand and twenty woodenboats were gathered by Ichang Office to help the transportation. The freight rate was regulated. This was the first time that control had ever been made on the woodenboat business.

5th Dec. In learning that S. S. "Haiyuen", "Haiheng", "Hailee", and "Haitseng" had not been fully used in Hong Kong, they were sold to Jardine Co. at a price of £300,000 on this date. (They costed £341,700 when built in 1933.)

28th Dec. A loan was made to the boat-owners to build wooden-boats in order to reinforce water transportation in the interior and regulations were promulgated. This was the first time our government had ever made a policy on loan

to ship-builders.

Since the war began, eighty-seven vessels and receiving lighters with a total tonnage of some 110,000, were to be gathered for defensive constructions by military organizations: 24 vessels at Kiangyin, tonnage 43,948; 12 vessels at Min River (閩江), tonnage 7,562; 10 vessels at the Hwangpo River (黃浦江), tonnage 18,642; 6 vessels at Lingyuen Harbor, tonnage 10,747; 7 vessels at Chenghai (鎭海), tonnage 6,657; 4 vessels at Wulungshan (烏龍山), tonnage 2,063; 6 vessels at the Pearl River (珠江), tonnage 1,979; 18 vessels at Matang, tonnage 24,994. After the victory of war of resistance, a compensation of more than US$3,590,000 was given to 34 private enterprise concerns for their losing vessels to the government during the war. US$8,188,367 was used to buy the war-surplus vessels from U. S. A. US$1,190,000 was used as repairing fund and navigating fund. The insufficient amount would be taken on a long-period loan basis to be refunded to the government in 15 years. This was all the assets for the establishment of Fuhsien Navigation Company. (It was fromally established on 23rd of June, 1948.)

The Twenty-Eighth Year of the Republic of China (1939)

9th Jan. Ministry of Communications ordered Hankow Navigation Administration, which was then stationed at Chungking, to supervise the construction of Szechuen wooden-boats in a reformation design by a loan of the government. The gross tonnage of each boat was to be 60,

48, 36, 30, 24, 18 or 12 tons depending on its draught. The boats sailed in Yangtze River, Fui River (涪江), Chialing River (嘉陵江), Chi River (綦江). The loan to the boat-owners amounted to NC$1,000,000. The construction was to be accomplished in two years and was undertaken at Chungking, Luhsien, Yiping (宜賓), Nanchun (南充), Leungchung (閬中), Kwangyuen (廣元), Meiyuen (綿陽), Taihoichen (太和鎮), Chikiang (綦江), and Fuiling (涪陵). Such work resulted in 388 vessels and at a total tonnage of 7,398. (See my book, "Policy of Ship Construction during Wartime" in "Policy on Navigation.")

16th Jan. The capacity of building and repairing ships was greatly increased by the enlargement of the Mingsheng Machine Factory which was owned by Mingsheng Enterprise Company and headed by Chou Mou-pei (周茂柏). 2 steelshell passenger-freighter ships, named Ming Wen and Ming Wu at a tonnage of 500 each, were accomplished on that day, and some 100 tons of other vessels were also built up. It counted a great deal to the navigation in Szechuen River.

January Assisted by Kwangchow Navigation Administration, a War-time Civil Navigation Services in Hsikiang (西江) was organized. Vessels on fixed sailing schedule were to be joined into the organization in handling civil and military transportation. One of the functions of the organization was to take care of the unserviced vessels and to train the jobless seamen. It turned out to be very beneficial.

February The six vessels in Hongkong named "Shienglee", "Anlee", "Moulee", "Hsinlee", "Fonglee"

"Meilee" and owned by the Chengchih Shipping Company, which was established in the 31st year of Kuang Hsu in the Ching Dynasty, were under an attempt to be turned over to the enemy. CMSNC being the partner of that company brought a suit both at Hongkong court and at Chungking District Court against that Company. Thus, the six vessel had never been used by the enemy until the time of Hongkong's surrender. The Chenchih Company was dissolved.

April Ministry of Communications promulgated the fare standards for steamships and wooden-boats in Szechuen River. From then on, the water transportation rate was to be controlled by navigation administration.

April Committee for Administration of Winching Stations set up winches in the receiving lighters of Shetang. Head Winching Station of Yuen River (沅江) was established at Chengteh. Consecutively winching stations were established in Chinglungtang (青浪灘), Owntzetung (甕子洞), Chuichih (九磯) and Hungshe (橫石).

May A survey group of Kingsha River (金沙江) was organized by Central Government and provincial governments of Szechuen and Yunan (雲南) in order to exploit the navigation in that river. The first trip was conducted by Bourige (Dutchman), the adviser of League of Nations to China, accompanied with Hsu Hsien-yao (許顯耀), Hu Yun-chow (胡運洲), Ching Yun-tai (錢運泰), Chang Chiung (張炯), over a distance from Kingkangkai (金江街) of Yunan to Yiping of Szechuen. Encountering an accident in the site between Yutung (漁洞) and Laochuntang (老君灘), Bourige,

Hu Yunchow and Chang Chiung gave their lives. Since then, Wen Tsong (萬琮) was assigned by Ministry of Communications to make several trips between Monkou (蒙姑) and Yiping. This built up a foundation for the navigation of steam ships in Kingsha River between the sections of Yiping–Pingshan (屏山) and Yiping–Meiyiszu (蠻夷司). (See Wen Tsong's book, "King–sha River")

29th June With the assistance of the Winching Stations the big vessel "Kiangsin" of CMSNC (at 3,800 tonnage) could make its way up to Szechuen from Ichang. The navigation in Szechuen River had been improved by an Englishman named Little before 1951 but vessels more than 1,500 tonnage could never sail on Szechuen River. As the sister–ships of "Kiangsin", "Kiangshun", "Kiangan" and "Kianghan" consecutively sailed up to Szechuen maintaining service between Chungking–Wenhsien. Their tonnage were all above 3,000. This was a marvellous achievement in our navigation history.

June Winching station was set up at the site of Hutang (狐灘) along Szechuen River.

July Ministry of Education decided to establish a Maritime College and appointed Wu Chun–sun (吳俊升), Ho Mou–ling, Pang Kwang–chiung and myself as the members of the preparation committee. Sung Chien–Hsun (宋建勳) was designated as the Principal of the college after its establishment. Steering, engineering and ship–building were the main courses in that school. It had an excellent record. Graduated student all turned out to be the key

personnel in the navigation circle in later days. That school was consolidated into the Chiaotung University in July of 1943.

25th Sept. The first batch of wooden-boats was built up and launched in Chialin River. I as Director of Navigation Administration, presided over the ceremony.

October Winching stations were established at Leungshuichi (冷水磧), Youchachi (油榨磧) and Hsiamatang (下馬灘) along Szechuen River. Head Winching Station of Chialin River was also established, with three winching stations at Shelutze (石驢子), Tahsiasheyatze (大小石鴨子) and, Laoyiao (老鴞岩).

November Six passenger-freighter wooden steamers were going to be built at a tonnage of 180 by Ming Sheng Machinery Factory. Their names were Loshan, Pingshan, Shiushan, Wushan, Pishan, and Leingshan. Another three, named Ponshan, Yingshan, and Meishan, at tonnage of 230 each, were also under construction. All these vessels were built within two years. The navigation strength in Szechuen River was greatly reinforced.

November Committee for Administration of Winching Stations set up winching stations at Chingchutang (青竹灘) of Szechuen River and Lingshesentang (連石三灘) and Touloutze (斗簍子) of the Upper Yangtze.

November In order to build more boats and steamers in Hunan and Kwangsi provinces, the Ministry of Communications ordered the establishment of Hsikiang Shipbuilding Yard to be headed concurrently by me. Construction

was carried out in Luichow (柳州), Changan (長安), Luichen (柳城) of Kwangsi (廣西) Province, Hengyang, Yuenlin (沅陵) of Hunan Province, Chian (吉安) of Kiangsi Province. 5 shallow-water steamers and 742 woodenboats (3,907 tons) were completed in 1940. 453 wooden-boats (5,080 tons) completed in 1941. It rendered a big contribution to the combined water-land-transportation in Szechuen and Hunan at that time.

From the beginning of war, the 13th of Aug. 1937, to the end of this year, 14 vessels of CMSNC had been sunk in pursuance of government order—one at Chenghai (鎮海), two at Wulungshan (烏龍山), seven at Kiangying (江陰), and three at Matang (馬當), at a total tonnage of some 28,000. Vessels of CMSNC have transported 530,000 troops, 360,000 passengers, some 198,000 tons of military materials, some 88,000 tons of official items, some 192,000 tons of commodities. 20 vessels at a total tonnage of some 24,300 were damaged or destroyed by enemy planes during their mission in loading troops or other cargoes. The Chenkiang, Nanking, Wuhu, Anking, Kuikiang and Hankow Branches of CMSNC along the Yangtze River were evacuated. With the change of war situation, Chungking and Wenhsien Branches were established. Offices were set up at Hengyang, Lukuo, Lushien and Anshieng (安鄉), and agencies set up at Yiyang (益陽) and Chialing (茶陵). Offices at Yingteh, Chikiang, Nanchang and Wuchen were set up and abolished shortly after.

The Twenty-Ninth Year of The Republic of China (1940)

13th March On account of the serious transportation problems, Generalissimo Chiang called a meeting of representatives of 19 units concerned, so as to consolidate transportation power and to re-adjust the transportation organizations.

April Based on the decision of the meeting, Military Transportation Supervisory Hqs. and Transportation Hqs. were closed up. Transportation Control Bureau was established, headed concurrently by General Ho Ying-ching (何應欽), Chief of Staff. Vice Directors were Chang Chia-ngao, Minister of Communications, and Yu Fei-pon, Commander-in-chief of Hqs. Service of Supply. Chien Chung-tse (錢宗澤) was appointed as the Chief of Direction Department.

May Winching stations were established at Potoupi (葡萄片), Shiengchitang (箱溪灘), Moupontang (磨盤灘), Tientzemo (天子墓), Hsiayichih (小姨溪), Hsiaomen (蕭門), Honghwachi (紅花季), Peichihou (白雞號), Laochuntang (老君灘), Chutang (竹灘) and Tatsetang (大賊灘,) so as to promote transportation ability and safety in Chialing River.

13th June Enemy pushed westward along the Yangtze River. Ichang fell. Ichang Office of Hankow Navigation Administration and Committee for Administration of Winching Station moved up to Wenhsien.

28th June The enemy declared the blockade of Hongkong. No access routes were available between Hongkong and the interior, except air transportation.

July After Ichang was lost to enemy's hands, it was not possible to maintain water transportation in Szechuen, Hupei and Hunan. Maintenance of communications between Southeast and Northwest was very difficult. A line combined with water-land transportation was to be exploited by CMSNC and Ming Sheng Enterprise Co. This line extended from Chungking to Fulin and was separated into two ways at Ponshui (彭水):-one to Kungtang (龔灘) by water, and then to Lungtang (龍潭) by land; the other to Lungtang via Chienkiang (黔江) by highway and then to Yuenlin and Changteh by water. Whole line completed in the summer.

1st Sept. Animal Transportation Administrative Department was established, headed by Wang Kuo-hwa (王國華), to administer the horse-back transportation.

November Winching stations were established at Kaochitou (高積頭), Fengtang (鳳灘), Tsetang (茨灘) and Shuangyungtang (双溶灘) all along Yu River (沅江) in order to assist the combined water and land transportation in Szechuen and Hunan.

During the period since the establishment of Committee for Administration of Winching stations and its stations in 1938 up to 1940, 1,258 steamers and 62,426 boats have been wound up by winching stations.

The Thirtieth Year of The Republic of China (1941)

January In order to build more wooden-boats, Szechuen River Shipbuilding Yard was organized. MOC appointed me

as its chief concurrently. The shipbuilding yards were situated at Senhwei (三滙), Chaohwa (昭化), Yiping and Hochuen (合川) of Szechuen Province. 587 boats including some food-transport boats and some material carrier (at a tonnage of 6,132) were built in a year.

March The companies Mentze (閩芝), Fesheng (蜚聲), Minyen (閩延), Lungtsien (龍津), Chiengtsien (劍津), Minsha (閩沙), and Foosha (福沙), were merged as the Fukien River Steamship Co. with the approval of MOC. It owned 55 steamships at a tonnage of 3,837. The lines between Foochow (福州)-Nanping (南平), Foochow-Chienou (建甌), Foochow-Yangkuo (洋口), Foochow-Shahsien (沙縣) were all run by this company. Business was quite improved.

April Ninpo, Wenchow and Foochow fell into the hand of enemy.

June Statistics showed there were all together 874 steamers at a total tonnage of 95,685 under our control.

3rd Sept. Enemy troops evacuated from Foochow.

20th Sept. Hankow Navigation Administration then stationed at Chungking was enlarged and reorganized as the Yangtze River District Navigation Administration and I was the Director. Szechuen River Navigation Administrative Department was shut down simultaneously. All the navigation administration was consolidated under a single sole control. Offices were established at the important water-transportation places: such as Wenhsien, Hochuen, Nanchung, Luhsien and Yiping of Szechuen Province so as to faciliate the administration.

1st Oct. Previously the Director of Construction Depart-

ment of Szechuen Provincial Government was automatically the Commander of Szechuen Ship Transportation Regiment. Since the Regiment was situated at Chungking which was far away from Chengtu (成都), the capital of the province, the Construction Department Chief could hardly take care of both organizations. Supreme Military Council appointed me as the Commander of Szechuen Ship Transportation Regiment, holding a rank similar to major general. The Regiment Office was removed into the Yantze River District Navigation Administration. It made an enormous improvement in the control of wooden boats for military transportation.

3rd Dec. British, American and Dutch vessels suspended their services between Hongkong and Shanghai. The world situation became tense and the war in Pacific was imminent.

8th Dec. With Japan's surprise attack on Pearl Harbor, U.S.A. and Britain immediately declared the war against Japan. As the Japanese troops started to occupy Shanghai Concession and launched an attack at Hongkong and Kowloon, we formally declared war against Japan, Italy and Germany.

Winching stations were established at Yangkuotze (羊角磧), Lukuotze (鹿角子) and Wulung (武隆) along Wu River (烏江) in assitsing the boats to pass through the critical shoals of the rivers in Szechuen and Hunan.

The Thirty-First Year of the Republic of China (1942)

11th Jan. S. S. "Mingsin" at a total tonnage of 54, and with a draught of 3 ft. was assigned to sail on the Kingsha

River. It covered a distance of some 70 kilometers from Yiping to Pingshan via Anpieh (安邊) and then to Meiyiszu.

7th April Vice Minister Pon Hsueh-pei of Communications submitted his resignation and Hsu En-tseng (徐恩曾) was the successor.

1st June An organization regulation for Water-land Transportation Combined Services Administrative Department in Szechuen/Hunan and Szechuen/Shensi (陝西) was publicized. Hsueh Kwang-chien (薛光前) was appointed as its Chief. Reun Hsien-chun (任顯羣) and Feng Tze-shan (范澤山) undertook the section between Chungking to Yuenlin, Changteh, Changsha, Hengyang via Fuilin Lungtang and Kungtang. Yuch Pin-nan (袁炳南) and Hsien Hai-chun (謝海泉) handled the section between Chungking to Pochi (寶雞) via Nanchun, Kwangyuen. Facilities to be used in the water-land transportation were wooden-boats, steamers, automobiles, horses and man-powers.

June Capacity of the water-land transportation line in Szechuen and Hunan, which was previously set up by CMSNC and Mingseng Enterprise Co. in handling postal packages, ordinance equipments, tea, rice and salt, ran up to a thousand tons monthly. Chenshui (辰水) line exploited by CMSNC covered a distance from Yuenlin to Chenchi (辰谿), then to Minchiacheng (閔家場) via Tungjen (銅仁) and Mayang (麻陽). All the transportation in these lines was handled by Water-land Transportation Administrative Department in Szechuen/Hunan and Szechuen/Shensi since its establishment.

10th Oct. The U.S. and Britain simultaneously declared

the abandonment of extraterritoriality in China. Inland river navigation right, coasting trade right and foreign piloting right were all prepared to be abandoned.

Nov. Chialin River was the main water route between Szechuen and Shensi. It had numerous shoals and water was usually shallow. Only small steamers could make its way up to Hochuen. Between Hochuen and Nanchun, no steamers were allowed to sail. Only wooden-boats sailed directly from Chungking to Kwanyuen. A combined hauling system could be employed in a rapid flowing water between Kwangyuen and Nanchuen. When the boats sailed downward in the rapid water, it might cause an accident of grounding their boats. Winching stations were also established at the site between Kwangyuen and Nanchun. Instead of man hauling system, winch could be used to improve the transportation efficiency.

In view of the importance of Chialing River, Chialin River Engineering Department was established and headed by Tung Wan-chi (董文琦), whose responsibility was to dredge the river between Chungking and Nanchun. The methods used by Tung were dyke-building, dredging, exploding shoal and dumping up the water exit, in order to elevate its height in the shallow-water days and to decrease the accidents.

14th Dec. Minister Chang Chia-ngao resigned. Tseng Yang-po (曾養甫) was designated Minister of Communications.

December Due to heavy losses of ships in Szechuen River, the Government constantly made both a loan and a reparation fund for repairing and hauling up vessels. Some NC$9,500,000 was subsidized to Mingsheng Enterprise Co. and NC$10,000,000

as a loan. Some NC$800,000 was subsidized to CMSNC and NC$6,000,000 as a loan. Loans were also made to Senpei, Tateh, Tatung and Tehsin companies and Navigation Department of Hupei.

The Thirty-Second Year of The Republic of China (1943)

1st Jan. Kwangchow Navigation Administration was renamed as Chu Kiang District Navigation Administration. In the meantime, offices at Kweiping (桂平), Chukiang (曲江), Hoyuen (河源) and Chaoching (肇慶) were set up.

11th Jan. The treaties of equal standing with U.S.A. and the United Kingdom were signed respectively at Washington D. C. and Chungking. The navigation right lost for a hundred years since the Nanking treaty was signed was recovered. (See Wang Kuang's book "Policy on Navigation," "The Withdrawal of our Forfeited Navigation Right").

January Transportation Control Bureau Shut down.

10th Feb. The Regulation of the Organization of Shipbuilding Yard was revised. Hsikiang and Chuenkiang shipbuilding yards were consolidated into one. I and Hsia Yian-ru were appointed as chief successively. Its function was to build wooden-boats for loading food and pier boats. 368 boats had been built during the period of its establishment up to June 1945.

1st April Chu Kiang District Navigation Administration took over all the navigation administration in Kwangsi Province. Kwangsi Navigation Administrative Bureau was shut down.

26th April The Yangtze River Administrative Department of CMSNC shut down. The head office of CMSNC was reorganized and restored its business in Chungking. Tsai Tseng-chi (蔡增基), the President, was re-appointed as the Chairman of Board of Directors and Hsu Hsieh-yu (徐學禹) as President. The vessels numbered eighteen at a total tonnage of 23,800, including the vessels evacuated, the one taken from Japanese Ship Kianhan, two ships named "Tsengping", "Anning" temporarily taken from Tientsien-Pukow Railway, "Kiangking" self-purchased and "Anhwa" rented. Six giant vessels among the whole occupied a 90 percentage of the total. Big in size and deep in draught, these giant vessels could only anchor for long. The business of CMSNC relied upon the medium vessels sailing between Chungking-Luhsien, Chungking-Wenhsien and Wenhsien-Sentouping (三斗坪). It had been in a very difficult state. However, that CMSNC's business was restored so rapidly after the war was attributable to its re-organization at this time. It laid a foundation of its rehabilitation.

May The huge products of Szechuen crops, coal, salt and sugar were transported for civil and military use mainly by wooden-boats. The original wooden-boat guild was not satisfactory due to its complicated elements. Principles for the organization of the Szechuen River private wooden boat guild and of workers' union were put into effect by Ku Cheng-kang (谷正綱), the Minister of Social Affairs and Tseng Yang-po, the Minister of Communications in order to reinforce the organization of private boat business and to improve the

transportation efficiency. A united boat business guild and a united workers' union were also organized. For each river of Szechuen lower part of the Yangtze, upper part of the Yangtze, Chialin River, Hsu River (渠江), Fu River (涪江), Tou River (沱江), Mien River, Chi River, Wu River, Yulin River and Kingsha River, private boat business guild and workers' union were respectively organized in eleven regions.

Lu Ching-shu (陸京士), the Department Chief of Ministry of Social Affairs, Liu Cheng-kai (劉振鎧), a specialist of Social Affairs and 1, the Director of the Yangtze River District Navigation Administration were responsible for directing and training. Mission was completed in a three-month time, making a great improvement in the wooden-boat transportation. Especially, it rendered a great help to the rehabilitation transportation after the war was over. Some eight thousand boats participated in the rehabilitation work loading governmental and military materials at a tonnage of more than 240,000.

June A water-land-air Combined Transportation Committee was established by Ministry of Communications. Combined transporation was undertaken in three areas: Southeast, Northwest and Southwest. Seven lines was included, such as: Chukiang-Chungking, Hengyang-Chungking, Loyang (洛陽)-Chungking, Tingkiang (India)-Chungking, Lanchow (蘭州)-Chungking, Kuming (昆明)-Luhsien and Kuming-Chungking.

September Two of American liberty ships "Chungshan" and "Chungcheng" were leased to us for loading military

supply sailing between overseas ports. They belonged to China Mail Steamship Co. in name. All seamen were Chinese except the captains and chief engineers.

6th Oct. Water transporation between Luhsien and Chungking part of Tingkiang–Chungking water–land–air combined transportation started to function. Air transportation between Tingkiang and Luhsien was opened on the 17th of the same month. It took 3 hour and 45 minutes to complete the air trip.

The Thirty-third Year of The Republic of China
(1944)

21st Feb. "Regulations for Prevention of the Utilization of Boats by the Enemy" was promulgated by the Ministry of Communications.

24th March S.S. "Liberty" leased to the Republic of China by the U.S. was redesignated as "Chungtung" After the victory of war of resistance, this ship and S.S. "Chungshan" and S.S. "Chungcheng", were all taken back by the U.S. China Mail Steamship Co. was no more existing.

20th May A revised Anglo–Chinese Seamen Agreement was signed by the Republic of China and Britain.

June The navigating route between Nanchun and Chungking had been completed. Survey was made by Tung Wenchi and I on the construction and on the winching installation per S.S. "Mingsun (at a total tonnage of 71). It resulted at successful improvement. Since then, the course in Chialin River extended to Nanchun and a fixed scheduled service was conducted.

July A regulation of subsidy to the increasing loss of water transportation was put into effect. The amount subsidized was based on per ton-kilometer. Some NC$124,670,000 was subsidized during the period of July, 1944 to Dec. 1944. Some NC$2,102,140,000 was subsidized in the next whole year.

September Special construction fund was appropriated for CMSNC to repair 7 harboring vessels (Kiangsin, Kianghan, Kiangan, Kiangshun, Kianghwa, Chienkuo and Kiangta) in order to meet the urgent requirement of counter-attack. Mingsheng Enterprise Co. also obtained a sum of CN$90,000,000 for repairing harboring vessels. Such fund was alloted to Senpei, Tateh and others as well.

October Liuchow fell. Chu Kiang District Navigation Administration removed to Peishe (百色) of Kwansi.

December Chu Kiang District Navigation Administration was closed.

The Thirty-fourth Year of The Republic of China (1945)

1st Jan. War-time Transportation Administration was established by order of Supreme Military Council and Yu Fei-pon was appointed as Director. Water transportation, air transportation and highway business in various provinces were all under its supervision and direction.

8th Jan. Minister of Communications Tseng Yang-po resigned and Yu Fei-pon succeeded.

16th Jan. Shen Yi (沈怡) was appointed as Political Vice Minister of Communications. Lin Hung-hsun (凌鴻勛) was appointed as Administrative Vice Minister of MOC.

1st Feb. By Lend-Lease Act, Ministry of Communications selected 30 high-ranking communication officials to go American for survey and research. I was selected to make research on water transportation.

1st March In order to concentrate military water transportation in the interior, Ship Control Office of the Ministry of War, Szechuen Provincial Ship Regiment and Ship-building-Repairing Manufactory of the Ministry of War were consolidated into the Yangtze River Zone Ship Adminitrative Department under the supervision of Hqs. Service of Supply, and was headed by Major General Liu Hsin-yi (劉心怡).

28th May Ship-building Supervision Committee was established to supervise the repairing work of anchoring vessels of Mingsheng Enterprise Co. and CMSNC for rehabilitation work.

July Kwangtung-Kwangsi Navigation Administrative Office was established in Peishe by Ministry of Communications.

August Kwangtung-Kwansi Navigation Administrative Office removed to Nannin (南寧).

8th August Ho Mou-lin, the Director of Navigation & Civil Aviation Department, MOC, resigned and was succeeded by Kao Ten-tze (高廷梓).

14th August V.J. Day. Japan declared total surrender.

September Kwangchow Navigation District Administration restored its establishment at Kwangchow.

3rd Sept. Japan formally signed the surrender portfolio

to the Allied Forces. Japan also signed surrender portfolio to China which was submitted to Army Hqs. in Nanking on 9th. This ended the eight year war of resistance.

28th Sept. The Law of Pilotage was promulgated by the National Government to be effective on 1st of April of next year.

23rd Oct. CMSNC formally moved its office from Chungking to Shanghai.

1st Nov. The Yangtze River Zone Ship Administrative Department was expanded and reorganized into National Water Transportation Command so as to handle the military rehabilitation and war-prisoners repatriation. Department Chief Liu Hsin-yi was appointed as its commanding-general.

November The board of directors of CMSNC was reorganized; Liu Hung-sheng (劉鴻生) was designated as the Chairman by MOC with Kao Tin-tze, Tu Yu-sheng (杜月笙) and others as directors and director Hsu Hsieh-yu as the President.

November All the navigation administrations were restored in Shanghai, Kwangchow, Tientsien. The Yangtze River District Navigation Administration removed from Chungking to Hankow and I just coming back from abroad, resumed my original post as director.

December Up to the end of the year, 1,335 enemy and puppet government vessels with a tonnage of more than 129,500 had been taken over by CMSNC which originally owned 28 vessels. The lines between Shanghai-Hankow, Shanghai-Ninpo, Shanghai-Tsingtao (青島), Tsingtao-Dairen

(大連), Tientsin–Tsingtao and Shanghai–Taiwan were promptly in service. The line between Shanghai–Chingwangtao was to be exploited in order to solve transportation problem for coal.

December Survey was made by me, as Director of the Yangtze River District Navigation Administration, on my way up to Hankow from Shanghai. Immediately method was designed to raise sunk ships, to build up public wharfs at Hankow, Kiukiang and Nanking. The water transportation between Shanghai and Hankow was thus greatly improved. Since I had accomplished much in handling navigation administration and water transportation both during the war and the rehabilitation, the Order of Bright Star, Top, 1st Grade, Kwang Hwa Award, 1st Grade, Navigation Administration Award, and the Order of Victory were bestowed by the government to me in praising my merit.

December There was great difficulty in sea transportation because for eight years Shanghai harbor had never been dredged and it was crowded with vessels and warehouses not properly managed. Shanghai Harbor Rehabilitation Committee was then established under the supervision of MOC to make things in order. The Mayor of Shanghai Municipal Government and Representative of MOC, Sung Hsi–Shang (宋希尚), were responsible for the whole work. The situation was improved after half a year.

THE RISING SHIPPING INDUSTRY IN FREE CHINA

By Prof. Wang Kuang,

Since the government was moved to Taiwan in 1949, the nation's shipping industry has been expanding steadily, particularly in the past few years, to keep pace with the industrial take-off. If the existing obstacles can be surmounted, it will certainly grow by leaps and bounds and before long we may become one of the maritime nations or even a sea power in the world.

The present steps may be suggested to speed up progress in our shipping industry:

1. Expanding China's Merchant Fleet

The government owned a total of 144 merchant ships in 1949 with an aggregate tonnage of 393,379 gross tons, representing about one-third of the total merchant marine tonnage. With the exception of a few ships which were built after World War II, most of the ships were either overaged or unseaworthy.

In recent years, however, the nation has acquired some newer and bigger ships, extending the sea routes from the near seas to the distant oceans and progressing from tramp to liner services.

Free China's growing trade in recent years has created an acute demand for more cargo ships. By the end of 1964, the merchant fleet has been expanded to more than 124

ships with a total tonnage of 628,627 gross tons, or an increase of 60 per cent over that of 1950. The speed of these ships was hiked from nine nautical miles in 1950 to 13.8 nautical miles in 1964.

During the period of 1950–64, a total of 73 ships, including eleven new ones, were added to the nation's merchant fleet. In the meantime, 24 government ships were either dismantled or lost in sea mishaps. As of the end of June, 1965, the number of merchant vessels has further been augmented to 135, having an aggregate tonnage of 698,530 gross tons, an increase of 77.6 per cent over that of 1950.

II. Role in International Trade

In 1954, the volume of our foreign trade registered a mere 2,717,000 metric tons, 45 per cent ef which were carried by Chinese ships. Ten years later, the cargo volume jumped to 8,288,000 m.t., with the Chinese ships sharing 50.82 per cent of the load. This fact clearly showed the important role played by the Chinese shipping.

In compliance with the government policy of replacing old ships with new ones, any shipping company contemplating the purchase of new ships is eligible for a bank loan amounting to 15 per cent of the cost, while 70 per cent of the remaining sum may be paid in long-time installment guaranteed by a government bank.

To purchase a used ship of good quality, the shipping company may apply for a bank loan as high as 70 per cent of its cost, or may pay in five-year installments together with a bank guarantee.

The government gives preferential treatment to promising ship companies. Income tax may be exempted for five years if the business volume of a ship company surpasses its original capacity by one-third. And any ships company maintaining ocean lines may enjoy the privilege of a 10 per cent deduction in income tax.

Due to the rapid growth of Taiwan's foreign trade, the chances of Chinese ships carrying the trade to faraway places have increased in proportion. In the case of banana exports, a record volume of 4,140,000 baskets was created in 1964 against an average of some one million baskets a year before. The bulk of banana shipping falls on Chinese freighters with the exception of two Japanese cargo ships. The steady banana trade prompted the Chinese shipowners to acquire 15 refrigerated ships last year.

Beginning 1963, the freight rate of tramp ships has been rising steadily as a result of largescale grain purchases by communist countries. The demand of more freighters is further sharpened by the Viet Nam war hence a 20 per cent hike in tramp freight rate. In the face of booming shipping business, the shipping circles in Free China are as enthusiastic as other nations in trying to modernize their shipping interests.

III. WHY SHIPPING SHOULD BE EXPANDED

It is estimated that about 99 per cent of Taiwan's international trade are conducted by cargo ships. In 1963, a total of 7,505,000 m.t. of cargoes were shipped by sea, while only 7,433 m.t. were transported by air.

It is logical that the Chinese exports should be carried by Chinese vessels which usually give lower freight rates. By possessing more Chinese ships, Taiwan's industrialization may be further accelerated and a higher agricultural production rate and people's living standard maintained. In the event of a counteroffensive against the Chinese communists, the service of Chinese ships will be even bigger.

Taiwan has a relatively high birth rate. If no effort is made in creating more job opportunities, the fruits of our economic growth may be offset by a lowering of the living standard.

Prior to 1956, unemployment among the seamen was prevalent as there were not enough ships to work on. Since then, more and more Chinese seamen were hired aboard foreign vessels that the number now has reached more than five thousand. As a result, we are now experiencing a shortage of seamen at a time when the demand for more sea-faring crew is rising abroad.

Merchant ships are bona fide foreign exchange earners. In 1962 alone, the overall freight revenue from our merchant fleet totalled some US$29,080,000. Of this sum, 45 per cent came from taking part in exports and the remainder from fulfilling shipping orders abroad.

IV. OUR PRESENT CONDITIONS

1. American East Coast and West Coast Line—Established in 1960, this line is under the operation of five Chinese shipping companies, namely the China Merchant

Steam Navigation Company, the China Union Lines, Taiwan Navigation Company, China Maritime Trust, and Eddie Steamship Company.

Altogether 23 Chinese liners are operating along this line, 13 on the East Coast Line and 10 on the West Coast Line. Being profitable, shipping circles in Taiwan are paying more attention to this line.

2. Japan Line—Established in 1953, this line is now chiefly for transporting bananas to Japan, and the return loads consist of general merchandise. Five liners, three Chinese and two Japanese, are operating on this line. Since last year, 15 Chinese refrigerated ships have added to this line.

3. Southeast Asia Line—Established in 1959, the CMSNC and CUL have been operating on this line. Other shipping companies like TNC and the Yung Ta Steampany Company have made irregular trips to SEA ports. A new ship of 6,000 gross tons, owned by the Ta Peng Steamship Company, will soon join this line.

4. Hong Kong Line—It is divided in two lines, the Keelung-HK Line and the Kaohsiung-HK Line. Prior to 1958, the former was serviced by five privately-owned ships. while the latter had eight. Now, the latter has eleven ships operating regularly. For two years, three brand new ships of 750, 1,000, and 1,500 gross tons respectively have been running along this line

5. Europe Line—Established in 1963, this line has only two vessels visiting European ports via the Middle East and the Mediterranean Sea once every two months. It is still on

a trial basis.

6. Latin American Line—Beginning September 1964, the Eddie Steamship Company has been assigning two cargo liners of 12,000 gross tons to visit Latin American ports once in every two months.

7. Tramp Line—Chinese cargo ships are mainly engaged in tramp services. Their routes and destinations are predetermined by trade possibilities. Main tramp lines are Japan, the Philippines, the Middle East, South Korea, and the Ryukyus. Such Taiwan products as sugar, rice, salt and coal are usually shipped to Japan by tramp ships.

V. DIFFICULTIES FACING INDUSTRY

Lack of capital has been the general stumbling block confronting the shipping circles in Free China. The development of shipping business is restricted by the difficulty in accumulating enough capital to buy more ships. It is hoped that timely financial support may be extended by government banks with low interests and in long-term payment.

The extra burden shouldered by state-operated shipping companies should be greatly lightened. Because they have to maintain a seaman reserve, pay the upkeep of military vessels, and keep money-losing lines open, they are usually hard-pressed financially. As a remedial measure, the government should try to ease their financial obligations and invest money in procuring new ships.

The quality of Chinese seamen should be improved as the demand for more Chinse sailors is increasing both at home and abroad. Those seamen who came from the mainland

are getting old now while new men are in need of training in order to man modern ships.

To train enough qualified seamen, training classes, regular maritime school education, short courses and even seminars are necessary. Meanwhile, emphasis on good conducts and discipline should be stressed among seamen so as to preserve Chinese traditional seamanship and minimize sea mishaps.

Subsidies should be given to the shipping companies operating regular liner routes. The newly established Europe and Latin America routes can hardly be maintained for long without government support, as both freight rates and cargo volumes are low. In the absence of government aid, shipping circles are hesitant in opening the Australia and Africa routes due to their uncertaintly in securing enough cargoes.

Government subsidies should also be extended to shipping companies for building new ships. As the outlay for constructing new ships in Taiwan is much higher than other shipbuilding nations, because most of the shipbuilding materials have to be imported, government subsidies will help narrow down the differences in cost in building ships abroad. In Japan, the cost for shipbuilding is 20 per cent lower than that of Taiwan. Thus, the present government policy of giving subsidies up to 15 per cent of the cost to any company willing to build a ship in Taiwan will get nowhere, because cheaper ships can be secured abroad.

VI. UPGRADING THE MERCHANT FLEET

Improvement should be done on our merchant fleet both

qualitatively and quantitatively. Overaged ships can never compete with new ones. The building of new ships to replace the aged ones is of primary importance in order to keep our international trade routes open.

China's shipping tonnage is still too low in international atings. According to a 1963 survey, the nation was in the 29th place among the world's shipping nations.

VII. TANKERS AND BULK CARRIERS

Since World War II, the tanker tonnage has had a very rapid growth. It has been raised from the prewar 17,000,000 tons D/W to some 81,000,000 tons D/W in 1964.

It was estimated that in 1970, the world petrol consumption may be increased from 24,900,000 barrels of 1962 to 40,000,000 barrels per day, while the oil-carrying capacity of tankers may be raised from 12,600,000 barrels to some 20,000,000 barrels. Obviously the oil-carrying business has a very bright future.

It has been an established fact that the bigger the tanker, the less is the cost; besides, the tanker freight has been stable all the time. The rapid increase in tanker tonnage among the nations, particularly Liberia, Norway, England, the U.S. and Japan, serves as a proof that tankers are money-makers.

At present, we own only six tankers totalling 96,000 tons D/W. Two tankers are running the Island Line, and the rest are operating on the Middle East Line. Actually we have no part in the world oil-carrying business. The addition

of more tankers to our merchant fleet is imperative if this nation is to share a part of the world's lucrative tanker business.

Bulk carriers are the new brand of ships built only after World War II. In prewar days, all such bulky cargoes as grain, coal, mineral ore, salt, sugar and cement were transported by tramp ships. After the war, for the sake of saving loading time, this type of vessels were built in large numbers. As the freight rate is comparatively low and considerable time can be saved in loading and unloading, both shippers and shipowners find such vessels highly serviceable.

As of October, 1964, the number of bulk carriers totalling some 21,000,000 tons D/W has been raised to 979 and more are coming. As most of the Taiwan products are of sugar, coal, and cement, it is a cost-reducing device if bulk carriers are used for shipping such goods to foreign ports. Besides, we can get foreign shipments orders easily if we possess a number of bulk carriers.

VIII. CONCLUSION

In our Third Four-Year Plan beginning 1961, our target for shipping tonnage was set for an increase of 300,000 tons D/W. However, at the end of the fourth year in 1964, a total of 380,000 tons D/W was added, surpassing the original target by 27 per cent.

In the current Fourth Four-Year Plan beginning this year, we again set our target at 540,000 tons D/W, representing a hike of 80 per cent over the former target, or an

increase of 42 per cent in tonnage. The task isn't quite easy. Yet if we try hard to surmount all the difficulties and ride the wave of the world's maritime development with zeal, nothing can deter us from fulfilling the goal.

In the past, the success made by shipping leaders at home and abroad has gained high esteem from among the world shipping circles. In view of the past accomplishments, plus worldwide reputation of our seamen, and the allout support from our people, I am quite confident that our country will become a sea power in the not too distant future.

(The China News; July 11, 1965)

DEVELOPMENT & MODERNIZATION OF SHIPPING INDUSTRY IN THE REPUBLIC OF CHINA

By Prof. Wang Kuang

I. EVOLUTION OF WATER TRANSPORTAION

1. The Mainland Time

Before the Sino-Japanese War, the Chinese merchant fleet consisted of about 600,000 gross tons of ships which served about one-half of the need for shipping along the coast and through the interior waterways of the country. The remaining one-half of the transportation needs were met by the British and Japanese ships. No Chinese ship operated over the oceanic routes, which were then being monopolized exclusively by foreign ships.

The Sino-Japanesc war damaged almost the entire pre-war merchant fleet so that by V. J. day the remnant merchant fleet consisted of less than 80,000 gross tons. Recovery of navigational rights enabled the Chinese shipping industry to enjoy rapid post-war growth. As of October 1948, 3,839 commercial vessels totalling 1,159,897 gross tons were registered under the Chinese flag. Had it not been for the Communist insurgency which rendered certain areas inaccessible, the shipping business along the coast-lines and through the inland waterways could have enabled our shipping industry to attain even higher level of development.

2. After the Government's Removal to Taiwan

Only 144 ships, mostly damaged and old-aged, totalling 393,397 gross tons were withdrawn from the mainland. Low ebb in international maritime shipping further aggravated the situation and brought our shipping industry to a serious crisis. The past 18 and a half years have seen this country's shipping industry through three stages of development, rehabilitation, expansion and renovation. The fleet has increased in size as well as in average tonnage of its ships, and developed tramp service and liner service routes for both coastwise and oceanic shipping. The industry has emerged from pure cargo service into mixed cargo and passenger service. The following will give an account of each of the three stages of development:

1) Rehabilitation: The 144 ships withdrawn from the mainland were all of medium and small size with an average of 2,730 gross tons and incapable of participating in oceanic service. From 1950 to 1958, the smaller ships were disposed of and large ships added. As of the end of 1958 the Chinese merchant fleet comprised altogether 84 ships totalling 318,867 gross tons, with an average of 3,796 tons. Although the number of ships fell by 42%, and total tonnage by 19%, the average gross tonnage per ship rose by 39%.
2) Expansion: From 1959 to 1966, in addition to the purchase of existing ships, new ships were constructed within the reach of financial capability. At the end of 1966 total tonnage of the 143-ship fleet was 710,666.01 gross tons,

1,004,531.12 DWT. This gave an average tonnage of 4,900 gross tons. Compared with the 1958 merchant fleet, the number of ships had risen by 71% and the total gross tonnage by 123% over 1958 and average tonnage per ship by 30%. It was during this period that the Government completed the first shipbuilding plan, namely four 13,000-DWT high speed cargo ships and two 5,500 DWT and one 3,700 DWT cargo liners.

3) Renovation: From 1967 to June 1968, a capability improvement and renovation program ushered in a new era in this country's shipping industry. The following will briefly describe this two-pronged program.

   i) Capability improvement. The merchant fleet now (June 1968) consists of 155 ships, twelve vessels more than in 1966. Gross tonnage stands at 809,234 tons (1,157,241 DWT). The capability of the ships has enjoyed significant improvement. Average speed, for example, was greatly improved. While no Chinese ship in 1966 was capable of speeds between 18 and 20 knots, six are now within this speed range. Number of 15.5 to 19 knot ships has risen from 27 to 39, and the number of 12 to 15 knot ships from 55 to 65; while the 10 to 11.5 knot ships dropped from 49 to 37 and the 8 to 9.5 knot ships from 13 to 8.

   Age of vessels, another criterion for comparison, has fallen considerably since 1966. It stands now as follows:

Under 5 years	28	or	18.06%
6–10 years	18		11.61%
11–15 years	23		14.84%
16–20 years	18		11.61%
Over 21 years	68		43.88%
	155		100.00%
Average age	16 years.		

This improvement of capability was achieved through the joint effort of the Government and the industry in retiring the World War II Liberty ships and other overage equipment This program is still in progress.

ii) Implementation of the Renovation plan for vessels. The Ministry of Communications launched the second shipbuilding plan in 1966 aiming at the acquisition of new commercial ships totalling 118,500 DWT. Allocation of this tonnage was as follows:

Five dry cargo ships, each 12,500 DWT and capable of over 18 knots, were allocated one each to the China Merchants Steam Navigation Co., Taiwan Navigation Co., the China Union Lines, the Chinese Maritime Trust, and the Eddie Steamship Co. Two dry cargo ships, each 7,500 DWT and capable of over 15 knots, were allocated one each to the Ta-Cheng Shipping Company and New Taiwan Shipping Co. Two 5,500-DWT refrigerator ships were allocated one each to the Shing-I Navigation Company and Ta Yang Navigation Company. Two ships totalling 30,000

DWT and capable of over 14 knots were allocated to the CMSNC and the First Steamship Company. Besides, construction of four 5,500-DWT refrigerator ships was contracted to the Taiwan Shipbuilding Corporation (TSBC), one each for the China Union Lies, CMSNC, the Taiwan International Line, and the Ho-Tai Navigation Co. In addition TSBC constructed four 25,200 DWT cargo ships, two for overseas Chinese shipping companies and the remaining one each for the First Steam Ship Company and the Eddie steamship Company. TSBC delivered the first ship in early 1968 and the second one was launched in March 1968.

II. REGULAR LINER SERVICE LAID THE FOUNDATION FOR THE DEVELOPMENT OF THE SHIPPING INDUSTRY

1. Taiwan/America Liner Service

Import from the U.S. to Taiwan has been on the increase, having nearly tripled itself from 560,000 tons in 1958 to 1,640,000 tons in 1967. Beans, wheat and raw cotton have been the principal items of import. Exports to the U.S. have been largely wood products, textiles and canned food. Recently, with the termination of U.S. Aid, and the restrictive quota on import of textile products by the US., Taiwan exports to the U.S. have been on the decline, amounting, for example, to 390,000 tons in 1967, which was slightly below the 410,000 tons of 1965.

Soon after the formal inauguration of this route early

in 1960 volume of export cargo had once been increasing yearly. Nevertheless, owing to low frequency of service compared with that offered by the foreign companies, the share of the traffic carried by Chinese ships has declined from 42.1% in 1962 to 26.3% in 1965, and further down to 17.7% in 1966 and 9.95% in 1967.

Since import commodities have lent themselves to bulk shipment, Chinese ships have carried over two fifths of the volume. This ratio once reached a high of 48.7% in 1966, but dropped to 43.5% in 1967.

At first, The Taiwan Navigation Company assigned three ships to serve between Taiwan and the west coast via Japan both way; while CMSNC and the China Union Lines togther assigned seven ships to serve the east and the west coast respectively via the Philippine or Japan on the outgoing trip and sailing directly toward Taiwan with occasional calls in Japan on the return trip. Although each company scheduled one monthly service in each direction, their schedules were not well adhered to. In the early stage, those participating in these services were mainly Liberty ships with a speed of only 10 knots per hour.

After 1966 ships plying between Taiwan and the east caost consisted of four of the CMSNC, four of the China Union Lines, two of the Chinese Maritime Trust, and two of the Eddie Steamship Company totalling twelve ships with 140,061 DWT. Their speed ranged from 15 to 18 knots per hour. Out of these ships the four constructed under the Government's renovation plan were comparable with foreign

vessels. Ships sailing between Taiwan and the west coast consisted of two of the CMSNC, five of the Taiwan Navigation Company, two of the China Union Lines and one of the Eddie Steamship Company, a total of ten vessels with 108,417 DWT. Their speed ranged from 10 to 16 knots. Only one of the ships was a Liberty ship, the rest was comparatively new cargo ships with an average age of about 10 years.

Generally speaking, our shipping industry has tried its utmost toward placing the ships with the best capabilities over this route. The following problems remain ahead of us.

1) Source of Cargo. Although the the Sino-American trade has been incresing yearly, it appears to have levelled off at the 1,600,000 tons of 1965. In 1966 it fell to 1,340,000 tons. Although 1967 brought a slight increase, the total traffic reached only 1,640,000 tons. Such being the case, the source of cargo to be shipped along this route will be limited and any increase will be moderate. Currently, 25 Chinese ships are serving this route. For beans and wheat from the U.S. tramp ships at time have to be used. Therefore, more Chinese ships than necessary are operating regular liner service over this route. Action is required to build up new cargo sources, and further steps are required to improve the capability of ships serving this route. A ceiling should be imposed on the number of vessels in order to avoid cut-throat competition among Chinese vessels which would weaken our position vis-a-vis the foreign companies.

2) Competition from conference ships. Foreign companies serving this route are closely organized into four conferences and serve with ships of superior capability. Our ships, because of inadequate dependable source of cargo, have to depend on cargo between Japan or the Philippines and American ports. Low efficiency of these ships and schedule delays have made it possible to obtain only a part of the low rate cargo.

As soon as further improvements are made on the capability of our vessels, we must strive toward improved service and schedules in order to secure the high rate interport cargoes. Our ultimate objective is, of course, to be in a position to join the conferences.

2. Taiwan/Japan Liner Service

Regular liner service along this route was inaugurated in 1953. At first, one ship each of the CMSNC, the Taiwan Navigation Co. and the Shanghai Industrial Co. participated. Later on two Japanese companies participated in the traffic, each assigning one ship to serve this route. Bananas have been the principal export commodity with shipments made under an allocation system. Import commodities consist mainly of general cargo secured by free solicitation. The Japanese companies, owing to the feeling of national affinity among Japanese shippers, have been in a better position to secure greater tonnages than the Chinese companies. In 1955 the Chinese shipping companies implemented a revenue pooling arrangement among themselves with good results. There is a real necessity in restoring the pooling arrange-

ment, which was terminated for some unknown reason in 1958.

In the past, out of the five ships assigned to ship bananas Tai Tung had the least spoilage rate. In 1960, Japan assigned two new 14-knot, 3,600-DWT ships for shipping bananas. This move threatened the position of the Chinese ships. Beginning 1962 the Foreign Exchange and Trade Commission insisted that bananas for export to Japan be shipped in refrigerator ships, in order to reduce spoilage and improve our export position. As a result, scheduled operators began to assign refrigerator ships for shipping bananas. The Taiwan Navigation Company, CMSNC, and one other steamship company as well as the two Japanese companies have all switched to refrigerator ships. Recently, Japan lifted the restrictions on banana imports. The use of a fleet of refrigerator ships capable of maintaining freshness and reducing spoilage rate (spoilage rate in 1967 was as low as 2.35% compared with the previous figure of 7%) has rapidly expanded the export of bananas from Taiwan to Japan, which rose from a yearly average of 800,000 baskets prior to 1962 to 1,200,000 baskets in 1963; 4,140,000 in 1964, 7,000,000 in 1965; 7,600,000 in 1966; and 8,730,000 in 1967.

The original five liners proved to be insufficient in 1963, and as a result, a number of new shipping companies were organized and new refrigerator steamships purchased and assigned for the banana traffic. At present, altogether 20 refrigerators (excluding the two Japanese ships) capable of shipping 1,600,000 baskets of bananas a month are in

operation. Because the banana traffic is subject to seasonal fluctuations, these ships can all be fully utilized only during the peak months from April to June. This led to the establishment of a Refrigerator Ship Group within the framework of the Overseas Joint Shipping Office responsible for cargo allocation.

3. Taiwan/Southeast Asia Liner Service

Liner service along this route was inaugurated in January 1959. One ship each of the CMSNC and the China Union Lines first took part in the operation. The CMSNC ship was making four trips a year and the China Union Lines ship eight trips, with the two companies dovetailing their sailings to aim at one sailing each month. Beginning from 1964, the China Union Lines increased its service frequency along this route by adding five ships and Yung Ta Navigation Company also participated with one ship. At present, an average of over five monthly services are being offered.

Principal export commodities from Taiwan consist of sugar, cement, tea and light industry products; imported goods consist of bauxite, iron ore, rubber and corn. Shipping tonnage has been on the increase: 680,000 tons in 1962, 940,000 tons in 1963, 1,650,000 tons in 1966 and 2,000,000 tons in 1967. For some years prior to 1965 Chinese ships shared between 19.7% and 24% of the traffic. In 1966 the percentage rose to 38.7% and in 1967 further to 41.6% because of the rapid increase in exports to Vietnam. As regards imports, Chinese ships shared 50% of the traffic at the lowest and 79.9% at the highest.

The decline in the percentage of import traffic shared by Chinese ships deserves our special attention. As to commodities for export, more effort should be directed toward securing for the Chinese ships a part of the share (approximately 60% of the total export volume) now being enjoyed by foreign ships. Adding refrigerator ships, securing inter-port cargo shipments, increased service frequency and improved matching of the sailing schedules with the export sales may help the Chinese shipping companies to improve their operations on this route.

In addition, a number of tramp ships operate non-stop between Taiwan and Bangkok or Singapore. Average total monthly frequency is about 15 trips and carrying capacity about 80,000 DWT.

4. Taiwan/Europe Liner Service

Liner service along this route began in January 1963. The Eddie Steamship Company first took part by assigning 3 Victory ships. Their schedule was one service a month in each direction. The voyage originated from Kaohsiung, with calls at Singapore, Aden, Port Said, Casablanca, Antwerp, Rotterdam, Bremen, Hamburg and back to Kaohsiung. In May 1967 the China Maritime Trust obtained permission to join the European and Far Eastern Navigation Conference, marking the first Chinese membership in an international shipping conference. It offered monthly service from Keelung via Kaohsiung, with calls at Hongkong, Singapore, Port Swettenham, London, Hamburg, Rotterdam, Antwerp, and back to Taiwan via the east coast of the U.S. This service

was launched with six ships but is now operating with four ships. Altogether 18 foreign shipping companies are engaged in liner service along this route with a total of 168 ships. Those making regular and irregular calls at Taiwan ports number around 44, ranging from 12,700 DWT to slightly over 7,000 DWT in tonnage and from 19 knots to 14 knots in speed with an average of 17 to 18 knots. All these foreign companies, being members of the Far East and European Navigation Conference, object strongly to the participation by non-conference operators over this route.

Principal commodities imported from Europe consist of ores and fertilizers averaging 80,000 to 100,000 tons a year. Export commodities are mainly sugar, canned food, tea, cement averaging approximately 120,000 tons a year. Participation in this traffic by such Chinese Companies as the Eddie Steamship Company and the China Union Lines has broken the near-monopoly by foreign companies along this route. However, due to limited source of cargo, these companies have incurred considerable losses. Yet future prospect is still promising if they are able to secure inter-port cargo.

5. Taiwan/Central and South America Liner Service

Service along this route was inaugurated in September, 1964. The Eddie Steamship Co. first took part by assigning two ships to give one service every one and a half months originating from Taiwan along the following route: Keelung-Kaohsiung-Hawaii, Callao (the port for Lima, Capital of Peru)—Valpraiso (the port for San Diago, Capital of Chile)—

Buenos Aires (capital of Argentina)—Rio de Janeiro and via the Panama Canal on the return trip to Taiwan. As to the shipping industries of South American countries, Brazil and Argentina are the only two countries that possess any significant merchant fleet, with about 1,200,000 tons each. Japan leads all other countries in navigation over the shipping routes between the Far East and South America. There are altogether three routes:

(1) from the Far East via the Panama to the east coast of South America,

(2) from the Far East via South Africa to east coast of South America, and

(3) from the Far East via the west coast of the U.S. to the east coast of South America. The Japanese operators total 36 calls to the east coast of South America and an equal number to its west coast every year.

At the present time, our trade with Latin America is negligible. Export to this area amounted to only 72 tons in 1958 and dropped to 36 tons in 1959, none during 1960 and 1961, and only 2 tons in 1962. Traffic in recent years has been insignificant: 729 tons in 1965, 774 tons in 1966 and 2,332 tons in 1967.

The situation is attributable to the fact that Taiwan requires little from Latin America and vice-versa, and even the limited amount of import into these countries has been almost monopolized by the U.S. As a result of heavy losses incurred by our shipping companies, service along this route was suspended in October 1967. Two ships originally assigned

to this route have been diverted to the Sino–America route. The China Maritime Trust has decided to inaugurate a South America service with a route similar to that followed by a Dutch line making a round trip to Japan and then to Rio de Janeiro and Argentina via Hongkong, Singapore, Penang, East Africa and South Africa. This company is yet undecided whether to retrace this route on the return trip or to return via the Panama.*

6. Taiwan Hong Kong Liner Service

This route has two originating points, namely Keelung and Kaohsiung, both with Hongkong as the destination. From the very beginning small private shipping companies have been operating over this route with small coastal ships. The participating companies formed by themselves an Offshore Joint Shipping Office to work out schedules and uniform rates and to administer the pooling agreement among the operators. Unified cargo solicitation and agency service and reduced cost of operation, have enabled all the operators to begin making profits. Prior to 1958, altogether five Chinese ships were operating between Keelung and Hongkong, and eight between Kaohsiung and Hongkong, all of low efficiency and around 500 DWT each. During the last three years,

* Shortly before this article went to press, the China Maritime Trust announced its decision to inaugurate this service round-the-world on January 12, 1969 with Oriental Rio, Oriental Esmeralda, Oriental Amiga and Oriental Carnaval all 18,000 DWT, 17 knot, 250-passenger passenger-cargo ships. The service will originate and terminate in Keelung, with calls at Kobe, Tokyo, Los Angeles, Panama, San Juan, Barronquilla, La Guaira, Rio de Janeiro, Buenos Aires, Capetown, Durbon, Mombasa, Singapore, Hongkong and Kaohsiung.

renovation has been effected, and the number of vessels operating from Kaohsiung increased to nine. As of 1966 all have been replaced by new ships of 1000 to 1500 CWT each and an average speed of 13 knots. About 30 trips are being made each month. This gives the Kaohsiung–Hongkong route a new look. Shortage of ship space no longer exists. Instead, space availability occasionally exceeds actual need. This change has, of course, greatly contributed to the Taiwan–Hongkong trade in that it offers service comparable to the scheduled service of Butterfield and Swire which has so long enjoyed a good name.

Principal commodities for export from Taiwan along this route consist of hogs, vegetables, cement, reinforcing steel bars, sugar and miscellaneous products. Chinese medicine and general cargo are principal items of import to Taiwan. Imports were 81,000 tons in 1950 and rose to 147,000 tons in 1967. As for exports there existed an upward trend from 180,000 tons in 1959 to 310,000 tons in 1962, 360,000 tons in 1963 and 410,000 in 1964. However, in 1965 the volume of exports fell to 300,000 tons, and in 1966 because export of cement was diverted to Vietnam, total exports to Hongkong fell sharply to a mere 166,000 tons, but turned upward again in 1967 to 286,000 tons. Traffic enjoyed by Chinese vessels over this route accounts for more than 70% both ways as a result of the successful completion of the renovation plan.

III. WORLDWIDE TRAMP SERVICE

Roughly one half of the Chinese ships are in tramp service, carrying bulk cargo to and from Taiwan and between

foreign ports. Their operation depends highly on the volume of bulk cargo movement. A considerable portion of their cargo consists of copra and ores from the Philippines to the U. S., logs to Japan, ores from India to Japan and ores and coal from the U.S. to Japan.

1. Taiwan Japan Tramp Service

Early in 1950 when Sino–Japanese trade was restored, both Japan–originating and China–orignating cargoes were shipped by Chinese ships alone amounting to a little more than 600,000 tons. After the signing of Sino–Japanese peace treaty and resumption of diplomatic relation between the two countries in 1952, Japanese shipping companies requested to participate in the cargo traffic between the two countries. At first, the ratio between volumes carried by Chinese and Japanese ships was set at 7 to 3. The ratio was subsequently changed to 6 to 4. Beginning April 1957, the ratio was again changed to 50/50, which has been maintained ever since. The Chinese ships have set up a shipping quota among themselves. The quota was allocated three ways among the CMSNC, the Taiwan Navigation Company, and the Joint Office of Private Shipping Companies. After a number of mutually agreed adjustments, percentage distribution among the three organizations now stands at 25% to CMSNC, 15% to the Taiwan Navigation Company and 60% to the Joint Office.

Almost all cargoes for export are bulk commodities such as sugar, rice, salt, and logs, while those for import consist of fertilizers, machinery, steel products and general cargo.

Cargo is plentiful, and the freight rate is favorable. This has been the most profitable route for the Chinese Tramp ships and naturally enjoys special attention from Chinese shipping circles. At the same time it is also an attractive route for the Japanese shipping industry. Sometime ago, Japan's request to further adjust the current 50 to 50 ratio in their favor was turned down by our Government. Total exports in 1965 were around 900,000 tons. In 1966 the volume dropped to 720,000 tons but again rose to 880,000 tons in 1967. Fertilizer import was 200,000 tons in 1965 and 190,000 in 1966.

2. Taiwan Philippine Tramp Service

Principal commodites of export over this line are salt, cement, general cargo and petroleum products. Imports consist mainly of lauan logs. Total traffic tonnage has increased from 142,000 tons in 1959 to 543,000 tons in 1966. In 1967 it decreased slightly to 526,000 tons. Prior to 1961, by far most of the imports and exports were carried by the Chinese ships with only an insignificant part going to Philippine ships. In recent years, with the active participation of the Philippine ships the ratio of traffic enjoyed by Chinese ships has gradually fallen from 72.28% in 1962 to 40.8% in 1966 and further to 29.3% in 1967.

Recently, as a result of the rapid rise in Taiwan's demand for Philippine logs and in the philippines' demand for Taiwan cement, total traffic tonnage over this line has soared. However, participation by the Philippine vessels in

the traffic has prevented the Chinese vessels from enjoying all of the traffic growth. Another development is the establishment of shipping subsidiaries by Taiwan's wood processing factories of strong financial position to ship lauan logs in Liberty ships. The use of dry-good vessels for transport of logs has proved uneconomical and in August 1965, Shing-Tai Navigation Company completed the construction of the first specific-purpose log carrier Chang-Tai of 6,150 DWT and 15 knots, capable of taking two million board feet of logs. It makes rugular tips to ship lauan from the Philippines to Taiwan. This marked the beginning of the use of specific purpose ships by Chinese operators along this route. In April and May of 1967, three other log carriers have been constructed and assigned to this route. Recently two more have been assigned. All these measures have greatly improved the competitive ability of Chinese ship in the log traffic over this route.

3. Taiwan/Middle-East Tramp Service

This route is mainly for the export of Taiwan sugar, with very little of other articles. After the political coup in Iraq, shipping from Taiwan has greatly decreased and it has become diffcult to maintain this route. However, import of crude oil has been incresing every year. In 1967, import of crude oil from Kuwait and the Persian Gulf area reached 2,660,000 tons. Henceforth, import of crude oil is expected to rise by 20% every year. Transport of crude oil along this route is being performed by both Chinese and foreign tankers under contract with the Chinese Petroleum Corporation. At

present, five tankers are plying this route.

4. Taiwan/Korea Tramp Service

Traffic along this route depends upon the frequency and size of bids won by the Taiwan suppliers participating in the Korean open tenders for materials and equipment. Exports rose to a peak of 290,000 tons in 1963. Lowest year was 1959, with only 90,000 tons. Imports from Korea are very limited, being slightly more than 20,000 tons a year. Principal commodities from Taiwan consist of paper, pulp, railroad ties, cement, salt, sugar, coal and rice. Imports consist mainly of marine products, gypsum, fruits, and Chinese medicine. Recent years have seen a growth in the export of sugar, paper and pulp and a tendency for the export of other commodities like coal, metals and textile products to decline. At present, only two medium-size Chinese ship are serving this route. The Republic of Korea has placed three medium-size ships in liner service between Korea, Taiwan, Hongkong and Bangkok. Competition from the Korean vessels poses a threat to the Chinese companies, and gives a dim outlook to the development of this route.

5. Taiwan/Okinawa Tramp Service

Principal commodities of export consist of sugar, salt, tea, bananas, cement, ores, metals and various types of machinery and timber products. Steel scrap is the main article of import. At present. two 500 gross-ton Chinese ships and two Okinawa ships sail regularly along this route. Traffic is about 50,000 tons for export and 12,000 tons for

import each year.

IV. NEW SHIPS USED FOR ROUND-THE-ISLAND ROUTE

After the Government's move to Taiwan, shipping to the mainland coast was stopped. As to round-the-island shipping, the Taiwan Navigation Company placed ships in regular service immediately after Taiwan's retrocession to China. Four 500-ton vessels sailed regularly between Keelung and Hualien, Kaohsiung and Hualien, Kaohsiung and Makung. In addition, private motorized sailboats offered non-scheduled service along these routes. After 1959, the Taiwan Navigation Company, in a move to help the private ship companies, gave up its service along these routes with the exception of the Kaohsiung Makung route on which a 800-ton newly-built ship was placed in service. At present, altogether twelve cargo ships ranging from 200 to 800 gross tons are used for round-the-island transportation. The motorized sailboats are no longer in service.

V. NEW LOOK FOR OUR SHIPPING INDUSTRY

1. New vessels for the Sino-American Route

Although Taiwan has assigned quite a number of liners to the Sino-American route, only four are of up-to-date efficiency, making it difficult to compete with foreign companies. In July 1968 the China Union Lines will place in service a new 13,600-gross ton Freedom Type ship built by Ishikawajima-Harima. Two more new ships, 12,700 gross tons each, will be delivered: one in December 1968 and the

other in November 1969. Both will be semicontainer ships each capable of carrying 82 containers, 8'×8'×20' in size. One high speed vessel to be operated by Eddie Steamship Company of 12,500 gross tons will be completed by October 1968. All these cargo ships will serve over this profitable shipping route. The Taiwan Navigation Company, being a pioneer in services along the Sino-American route, and with a view to improving its competitive power, entered last May into a contract with Mitsubishi of Japan to construct two highspeed cargo ships each of 12,300 gross tons and 18.2 knots per hour. One of these ships will be completed at the end of 1968 and the other in March 1969. Within a short period we will have a fleet of new ships to replace the Liberty and Victory ships which are currently serving the Sino-American route. These new ships will be of great benefit to the export of Taiwan made products and will improve the share of traffic enjoyed by the Chinese ships along this route.

2. Container ship service

The container ship is a good device for combined land-sea transportation service. Liner operators the world over are actively engaged in the development of this service. Beginning last year, our shipping industry has been planning for the acquisition of container ships. Both the Keelung and Kaohsiung Harbor Bureaus are making plans for the construction of piers specifically for the use of container ships. The Chinese Maritime Trust took the lead in offering such service by ordering from Japan one semi-container ship of 12,000 gross tons capable of taking 140 8'×8'×20' containers.

Constuction of the ship was completed in mid-April and has been placed in liner service on the Taiwan/Europe route. The CMSNC has included in its 1966 shipbuilding plan the acquisition of three semi-container ships each to hold around 120 containers. The company has entered into a contract with the Mitsubishi Shipbuilding Company calling for one ship to be delivered at the end of 1969 and the other two in 1970. These ships have given our shipping industry a good start in the containerized shipping business and will contribute to its future development.

3. Chinese Bulk Carriers

After World War II, trade in bulk commodities like grains, coal, ores, etc, has been on the increase. Moreover, since transportation of such goods mostly involve single trips, general cargo ships have been found unsuitable for the purpose and are seldom used in such service. As a result, bulk carriers have been constructed and placed in such service for the sake of economy. In 1965, altogether 1971 bulk carriers were in operation with a total of 31,500,000 DWT, a fact that bespeaks the rapid development of such carriers. Although the China Union Lines constructed several years ago four bulk carriers of 50,000 23,000 23,000 and 25,000 gross tons and the Eddie Steamship Company also constructed one of 42,000 tons last year, all these carriers now operate under foreign flags. Not until July last year did the Eddie Steamship Comany place into service two 23,500 ton bulk carriers under the Chinese flag. Furthermore, the Taiwan Navigation Company has concluded the purchase of a 18,000-ton bulk carrier mainly for shipping wheat from

the U.S. to Taiwan. The First Steamship Company's 16,500 ton bulk carrier was delivered in Japan at the end of April 1968. Another one of its bulk carriers contracted for construction by the Taiwan Shipbuilding Corporation was delivered in June 1968. Besides, the China Union Lines will have its 16,300-ton bulk carrier now under construction in Japan placed in service by January—March 1969. All these ships will fly the Chinese flag and will appear as Chinese bulk carriers over the shipping routes of the world. Future outlook for the operation of these new vessels appears good.

4. Plan for the Construction of Three 90,000-ton Tankers

In 1965, the world trade of oil reached as high as 800,000,000 tons. During that year, although there were 3,582 tankers of over 1,000 tons each with a total tonnage over 100,000,000 DWT, tanker business remains brisk. Outbreak of war between Israel and the UAR has closed the Suez Canal as well as oil pipelines from the Persian Gulf to the Mediterranean. Consequently, about 4,500,000 barrels of petroleum have to be shipped each day via the Cape of Good Hope to supply the demand of Western Europe. Overnight the whole whold became short of 20,000,000 to 22,000,000 tons of tanker space. As a result, not only tanker rates rose sharply, but it also became difficult to charter tankers. It was unfortunate that, owing to shortage of capital, our shipping companies did not have the equipment to profit from this business. As of now, Chinese shipping companies own only six tankers totalling a little over 96,000 DWT.

Last year, these tankers were barely able to ship only 3,167,000 long tons of imported crude oil. It was felt that the number of our tankers was by far inadequate and it would be a great problem to meet a yearly increase of 20% in crude oil shipments into this country. It is gratifying that prior to the outbreak of war in the Middle East, the Government had approved the construction of three tankers of 90,000 tons each. The first one was contracted for construction by Ishikawajima Harima of Japan and will be delivered at the end of 1968. The other two tankers are to be constructed by the Taiwan Shipbuilding Corporation and will be delivered in the next two years. The Kaohsiung Harbour Bureau has constructed a floating pier with underwater pipeline system off the coast near Ta-Ling-Pu for unloading and loading of crude oil. Construction work started in March 1968 and is expected to be completed by the time the tankers are delivered and placed in service. Future prospect for tankers is good, and continued effort should be made so that our tankers will have its place in the world-wide oil transportation market.

VI. NEW CONCEPT REQUIRED FOR A NEW INDUSTRY

Commercial vessels sail to the farthest corners of the world. Development of the shipping industry is not limited by territorial boundaries. Our shipping industry can help develop our economy, bolster our national defense, and ensure the freedom of our nation. It is an industry worthy of our efforts. Back in the the days when we were on the mainland,

our shipping industry was confined to our coastlines and inland waterways. Now, after 18 years of rehabilitation and expansion in Taiwan, our shipping industry has entered the renovation stage, and is vying in the race for sea power as well as building up a potential for the recovery of the Mainland. Today an estimate places the total tonnage of Chinese-owned vessels, when taking into account those flying foreign flags, at some five million tons, which compares well in strength with the merchant fleets of France and the Netherlands, which traditionally excel in maritime shipping. We could not have imagined this situation while we were on the mainland. However, further development of our shipping industry depends upon continued upgrading of the fleet, both in size and capability, as well as the accumulation of more capital and experience.

The steamship companies should operate their business with new concepts, and the government should adopt new measures aiming at a new era for the industry. With the shipping industry and the government working in concert, we are confident that we can witness the golden age of our shipping in just a few years.

PROGRESS TOWARDS THE OCEAN

Maritime Reconstruction of Taiwan

By Prof. Wang Kuang

I.

Maritime reconstruction consists of two main branches: shipping and fishing industries. As Taiwan province is in the environment of island economy, only development of shipping and fishing industries can make it break through the limitation of limited land area for radical development. Moreover, because the recovery of mainland China is our sacred mission, expansion of sea power is the task endowed to us by the age and also is the duty we have to take up.

II.

In reviewing the development of shipping industry of our country, we certainly have facts worthy of our rejoicing during these ten years. The pattern of operation has progressed from rented ships to self-operation. The business has proceeded from irregular sailing to regular sailing schedules. The cargoes transported have progressed from cargoes in general to those of special trade. Our merchant vessels now sailing in regular lines include China-US west coast lines, China-US east coast lines, Taiwan-Japan lines, Southeast Asia lines, China-Europe lines, China-Latin-America and China-Africa lines, Taiwan-Hongkong lines, Borneo lines and Middle East lines. As to ships of irregular sailing, there are many running from Philippines to Japan, from the United States to India and from the United States

to Japan. Our national flag can be seen flying on the vessels at every world famous ports except those in communist regions. When our government was on the mainland, our merchant ships were very busy in coastal and inland water transportation and had rare chances to visit these ports. I still remember, when I went to a tour in Japan, Thailand and Singapore year before last, I personally saw two 12,000-ton speedy cargo boats of China Merchants Steam Navigation Co., Ltd. and Taiwan Navigation Co., Ltd. and three or four cold storage vessels of private companies anchored at the Kobe harbor at the same time, busy in loading and unloading cargoes, while an old cargo boat of several thousand tonnage from Communist China feeling self-ashamed anchored alone far off in the port. Another time when I was invited by the Port Administration of Bangkok to tour the port, I saw on the same day five merchant vessels of 10,000-ton class anchored one by one along the Menam River busy in loading corn and a tanker of the Chinese firm Summit Industrial Corporation unloading oil. On that day, about 60 to 70 students from Marine College in Taiwan on their visit to Bangkok came to see the port in their neat uniform and high spirit. Several days later, I went to Singapore and saw the local largest shipping building, which formerly belonged to British merchants and was newly bought by Mr. H. Y. Tung, the shipping magnate, standing high on Collyer Quay. Mr. Tung's fleet normally anchor by the deep wharf in front of the building where only huge steamers of British, German, French, Italian and Japanese companies were allowed to

anchor before the war. All what I saw in my tours has shown that our shipping trade has been on the take-off, and everybody felt quite elated. It is no wonder that many seamen told me that whenever overseas Chinese see merchant vessels of their fatherland coming in distant voyage, they feel as if a visit from their own folks and gesticulate with hands and feet in extreme joy. Our merchant marine does not only extend our foreign trade, the more important is that it also ties together the centripetal force of overseas Chinese and stimulate their patriotic spirit.

As to the tonnage of our merchant vessels, we already have more than 1,700,000 dead-weight tons by the end of last year, which is three times more than the 500,000 tons ten years ago. There are many vessels for special trade, such as 10 big tankers of 416,000 tons, 17 cold storage ships of 78,000 tons, 20 lumber ships about 132,000 tons, 7 half container ships about 87,000 tons, and 2 full container ships about 21,000 tons. Again, due to the implementation of replacing new ships for the old one in the various years, the functional capacity of the vessels has been greatly increased. The average age of ships in 1967 was 16 years and is 9½ years in 1970. The average speed per hour was 13½ sea mile in 1967 and is 15½ sea mile in 1970. Under the fifth program of ship purchase or shipbuilding now in progress, aside from the two 100,000 ton big tankers now under construction by the Taiwan Shipbuilding Corporation, new ships of 140,000 tons are to be built. All these plans are going to be realized soon.

On the import and export cargoes transported by Chinese ships, they amounted to more than 8,600,000 tons in 1970 which is an increase over three times than the 2,700,000 tons ten years ago, and the figure for ton-sea-mile has increased over four times. What is more, the freight rate charged by Chinese ships is cheaper in general than the rate charged by foreign ships. This has made a greater contribution towards expansion of exports.

III.

The shipbuilding industry in Taiwan has progressed by leaps and bounds. In the initial period after government evacuation to Taiwan, Taiwan Shipbuilding Corporation could only build ships of three or four hundred tons. Now it can build speedy cargo boats of 12,000 tons, bulk carriers of 28,000 tons, and giant tankers of 100,000 tons. Recently, it has signed contracts with shipping companies to build two 100,000-ton tankers and four 58,000-ton bulk carriers. According to a statement of the corporation, the goal of its future effort is to raise its annual productive capacity to 250,000 to 300,000 tons, and ship repair to a total of 1,800,000 tons, and its machinery production will start from making of deck machines to the production machines for ship use with greater horse power.

IV.

As to fishing production, in the initial period after the restoration of Taiwan, the yearly quantity produced was

merely 50,000 metric tons. It increased to 531,000 metric tons, over ten times of the previous figure, in 1968; and it increased again to 557,000 metric tons in 1969. The execution of the Five-Year Economic Reconstruction Plan beginning from 1968 aims at an annual average increase of production of 66,000 metric tons. The goal of fishing production this year is 665,000 metric tons, and the goal of building fishing craft is 23,500 tons. According to the statistics published by FAO, the rate of increase of fishing production is quite high, only next to Peru but surpassing other ten countries including the United States, Japan, Germany and France. The area for our fishing operation has been gradually extending from Bashi Strait, Sulu Sea, Celebes Sea, Banda Sea, and Flores Sea to Arabian Sea in the Indian Ocean. Tuna fishing crafts even go through the Mediterranean Sea to reach the Atlantic on the one hand and to Samoa and Tahiti in the Pacific on the other. The fishing ground for dragnet operation is in the southern part of East Sea, Taiwan Strait, the northern part of South China Sea as far as Vietnam, Siam Bay and marine area in the vicinity of North Borneo. Large drive-in net fishing industry operates mostly in the vicinity of the Fishermen's Isles (Senkaku Gunto in Japanese name) northeast of Taiwan. As to the tonnage of fishing crafts, the biggest boat in the past was around 100 tons. At present most of the fishing crafts built are big ones; some are 600 tons and some 1,400 tons. The main boat for tuna fishing can be as large as 3,200 tons. Men working in fishing industry at present have numbered 273,000. All these results are due to

the hard work of the government in carrying out the policy of "power operation of fishing crafts, mechanization of equipment, scientific operation of work, and industrial management of business."

V.

According to the statistics of the British Lloyd's Corporation Register of Shipping of July last year, in the whole world there were 52,444 merchant vessels over 100 gross tons in a total of 227,489,000 gross tons and 338,838,000 dead weight tons. Among the 89 nations having merchant marine fleet, our merchant marine ranks twenty-third by tonnage. Our tonnage is a little less than Yugoslavia, Finland, and Argentine and more than Cyprus, Australia and Belgium. But if we also count all the vessels owned by national and overseas Chinese shipping companies under Liberian and Panaman flags, our tonnage will be almost equal to the real strength of the merchant marine of the traditional maritime transportation countries like Italy, France and Holland and may be ranked among the first ten. When we increase our tonnage one or two years after, we may be ranked in the sixth or seventh place, keeping abreast with Greece and West Germany. Chinese Communists usually put some exagerated statements in their propaganda to cheat the world. But they never mention their shipping, shipbuilding and fishing industries, just because that our great strength on this side has been understood by people that they do not dare to talk at random.

VI.

That the shipping, shipbuilding and fishing industries in our country have been in speedy progress during the recent ten years, in my opinion, is basically due to that the high development of maritime technology and maritime education and the richness of human resource give support to the national and overseas Chinese shipping enterprises and domestic fishing industry to expand their real strength and open shipping lines and fishing areas. Other factors like government protection, supply of capital by banks and talents among the managers naturally are the main causes for expediting the development.

Although there has been an annual increase of import cargoes transported by our national ships, it has for many years that the ratio of transporting such cargoes between our national ships and foreign ships is smaller for the former and greater for the latter. According to the statistics of last year, the ratio of our national ships is 37.4% while that for foreign ships is as high as 62.6%. We should strive hard to minimize this big difference, and aim to reach 50% to maintain our interest.

In this past decade or so, the pattern, kinds and direction of world sea shipping have undergone great changes as follows:

First, the source of power goes towards oil. In 1968 the world production of oil broke through 1.8 billion tons and oil producing countries increased to 55. So oil has occupied half of the world maritime cargo shipping. By the statistics

of July last year, the gross tonnage of oil tankers is 86,140,000 tons, occupying 37.9% of the gross tonnage of world merchant marine. Our shipping industry should not let the British, Japanese, Norwegian, Greek, American, French and Soviet companies getting too far ahead of us and should fight for wider market. Therefore, we should be more active in adding more oil tankers.

Secondly, Latin America and Africa have become main markets of raw material after the war. They have established systems of large size ships for special use with the industrially developed countries, such as the United States and Chili, Brazil and Europe, and West Africa and Europe. Based on the opening of new mining resources and the need of compatibility with economy of maritime transportation, they have built many ore vessels of large size.

Thirdly, the industrialization of developing countries and the economic measures for speeding the development of undeveloped areas have caused changes in the quality of commodities handled by trading companies. For instance, before the war the main shipping line of wheat on irregular schedule was from La Plata region of Latin America to Europe. But in recent years wheat is shipped to the rice consuming countries in the Far East. Such a change has caused the long-distance operation of trade, and standardization of technique and proceeds to the rise of a great number of bulk carriers. By the statistics of July last year, the gross tonnge of mine ore and bulk carriers in the world have reached 46,650,000 tons, and a majority of these ships belong

to the owners of Liberia, Japan, Norway, Great Britain, Greece, Italy, the United States, Sweden, West Germany and Canada. In face of this emergent market, our shipping circle should spend more effort on building large size bulk carriers for special lines of cargo in order to compete with them.

Fourthly, ships for containers are becoming more and more popular. The advantages of container ships are economy of loading and unloading time, convenience of sea and land through transportation, and decrease of loss of cargo, and especially the preference for consignment freight has become good business for ships sailing on regular schedule. The statistics of July last year shows that there have been 201 container vessels in the whole world, of which 154 are full container ships in a total of 2 million gross tons and 47 half container ships in a total of 550,000 gross tons. Such large figures have proved that the regular scheduled cargo vessels in general have been gradually replaced by container vessels. Fortunately we have made an early start on this line in November year before last by having nine container ships sailing on the Chinese–American line and having built special wharves at Keelung and Kaohsiung ports for containers. We should continue to make efforts in making further development for Taiwan to become the great transit station for containers. It will not only be beneficial for our shipping trade but also will make our ports more prosperous.

Fifthly, Japanese shipbuilding industry has already approached saturated condition (a total of 10.5 million gross tons was built last year, amounting to 48% of the ships

built in the whole world), and contracts for ships to be built are in demand over supply. As the shipbuilding technique of our country is getting more advanced and wages here are quite cheap, we are able to accept contracts in face of Japan's saturation to become the second shipbuilding nation in Asia in order to compete with other countries. It is our hope that our government will speed up the implementation of the expansion program of Taiwan Shipbuilding Corporation, especially the preparation of the Kaohsiung shipyard of 200,000 ton capacity by active absorption of overseas Chinese or foreign investment, so that it will be completed at an earlier date. This will not only take in contracts from domestic and overseas Chinese shipping companies which are eager to have their ships built here, but also will make the Kaohsiung Steel Works to be the main supplier of this work. It is really a beneficial work for several channels of industry in our urgent economic reconstruction hereafter.

VII.

In summary of what has been described above, except the fishing industry has not been discussed, because it has to follow the fixed policy in its subsequent execution, all other points seem to be serviceable for the goals of development of our shipping and shipbuilding industries hereafter. Now our country is provided with favorable conditions in climate, geographical location and labor force for maritime reconstruction. We should take this good chance to go forward to the ocean and conquer the ocean, so as to build a firm foundation of sea power for our country and to open a way for the everlasting prosperity of Chinese nationality.

(May 1971)

TRANSPORTATION IN TAIWAN IN THE LAST FIFTEEN YEARS

By Prof. Wang Kuang

I. RAILWAYS

1. The mileage of railways: In 1970, the mileage of railways in Taiwan was totally 3,982.4 kilometers, among which 1,000.4 kilometers were owned by the Provincial Government and 2,982 kilometers by Taiwan Sugar Company. The density of railway was 10.85 kilometers per 100 sq. kilometers. The lines owned by the Provincial Government were as follows:

North-South line	Keelung-Kaohsiung	408.5 kilometers
Ilan line	Keelung-Suao	98.7 kilometers
Pingsi line	San tson ling-Tsin tung	12.9 kilometers
Tamsui line	Hwashan-Tamsui	23.6 kilometers
Shenkuang line	Tantse-Shenkuang	8.7 kilometers
Pingtung line	Kaohsiung-Funglou	71.2 kilometers
Shunao line	Suifung-Lintung	12.3 kilometers
Chungho line	Panchiao-Chungho	6.5 kilometers
Lingko line	Taoyuan-Lingko	19.2 kilometers
Neiwan line	Hsinchu-Neiwan	27.9 kilometers
Taichung line	Chunan-Changhwa	91.4 kilometers
Chi Chi line	Ursui-Wai Chair Cheng	29.7 kilometers
Tungshi line	Fungyuan-Tungshi	14.1 kilometers
Taitung line	Taitung-Hwalien	175.7 kilometers

2. Transportation of passengers and freight by railways: Short distance travel is a special feature of Taiwan Railway passenger traffic. The average mileage was only 39.8 kilometers. The mileage of freight traffic was much longer.

The average distance per ton was 172 kilometers (all statistics of 1968). The daily average of the number of passengers and passenger-kilometers of the West Line were as follows:

Fiscal year	Daily (average passengers)	Daily average (passenger-kilometers)
1946	118,532	4,200,577
1955	203,145	8,227,151
1956	218,770	6,964,847
1957	255,180	6,457,670
1958	268,196	9,124,473
1959	264,122	9,214,618
1961	279,387	9,468,983
1962	255,135	8,706,699
1965	302,349	11,315,302
1966	318,082	11,766,978
1967	344,701	13,028,056
1968	355,414	14,138,808
1969	350,731	15,377,348
1970	335,278	16,126,410

The daily average tonnage of freight traffic and ton-kilometers of the West Line were as follows:

Fiscal year	Daily average (tonnage of freight traffic)	Daily average (ton-kilometers)
1946	6,400	903,805
1955	27,736	4,288,013
1956	28,006	4,343,566
1957	30.903	4,973,410
1958	31,080	4,938,570
1959	30,254	4,848,903
1961	32,399	5,384,945
1962	32,195	5,153,899
1965	37,429	5,918,433

1966	37,915	6,060,321
1967	38,973	6,373,527
1968	39,632	6,830,534
1969	37,938	6,602,168
1970	38,853	6,639,807

The daily average number of passengers and passenger-kilometers of the East Line were as follows:

1946	4,594	142,215
1955	9,591	214,100
1959	12,974	323,241
1961	12,108	317,292
1965	14,848	413.321
1969	18,763	581,282
1970	18,950	623,406

The daily average tonnage of freight traffic and ton-kilometers of the East Line were as follows:

1946	198	11,458
1955	923	61,995
1959	1,307	97,022
1961	1,264	96,193
1965	1,811	134,060
1969	1.490	119,441
1970	1,698	145,832

In 1968, the West Line of Taiwan Railway transported 130,080,000 passengers totaling 5,174,800,000 passenger-kilometers. The daily average number of passengers transported was 355,000. In comparison with that of 1967, the daily average number of passengers increased 3%, and the daily average passenger-kilometers increased 9%. In 1968, it transported 14,510,000 tons of freight totaling 2,499,980,000 ton-kilometers. The daily average tonnage transported was

39,600 tons. In comparison with that of 1967, the daily average tons increased 2%, and the daily average ton-kilometers increased 7%.

The percentages of inland freight transportation in ton-kilometers by Taiwan Railway and highway: In 1952, the railway portion of inland freight traffic was 87.93%, while the highway portion was 12.07%. In 1965, the railway shared 79.90%, while the highway increased to 20.10%. In 1969, the proportion of railway further decreased to 67.72%, and that of highway further increased to 32.28%. The percentage of the inland passenger transportation in passenger kilometers by railway in 1952 was 59.56%. In 1965, it decreased to 48%, and in 1969 it again decreased to 36.78%; the passenger transportation by highway increased considerably each year.

As to the revenue of Taiwan Railway, the income from passenger traffic exceeded that of freight. In 1969, the revenue from passenger traffic of West Line amounted to NT$1,495,268,711 while the income from freight traffic amounted to NT$828,583,291. The proportion of income from passenger traffic has been steadily growing.

3. Development plan in future: In order to match the increasing needs of passenger and freight traffic, Taiwan Railway Administration will undertake the following development projects in the near future:

(1) To increase the number of locomotives, passenger and freight cars—The West Line is to increase 37 electrical, diesel locomotives, 15 diesel passenger cars, 388 passenger cars and 790 freight cars. The East Line is to increase 7

diesel cars, 25 passenger cars and 60 freight cars.

(2) To install double tracks–Except the part between Changhwa and Tainan that has already been completed, the bottle–neck sections between mountain line, sea line and Ilan line will soon have double tracks.

(3) To construct new hump marshalling yard (which will be completed in Oct. 1971); to improve railway roadbed and bridges; and to add station facilities.

(4) To improve signals and communication equipment.

(5) To mechanize freight handling operations and to utilize containers for transportation.

(6) To expand facilities and equipment of workshops.

(7) To undertake the electrification of the principal lines.

(8) To elevate the railway lines in Taipei City.

Note: The double tracks between Changhwa and Tainan was already completed on Oct. 25 1970. Its total length is 142.5 kilometers. Except the 30.2 kilometers in station areas which can be utilized, the part of actual new construction is 112.3 kilometers. It took 3 years and 3 months to complete it at a cost of NT$374,000,000.

II. HIGHWAYS

1. The completion of East–West Cross Island Highway: Owing to the barrier of Central Mountain Range from North to South, The east–west cross island railway can not be built. The east–west cross island highway was planned during the years of Japanese occupation. But due to the fact that the areas which the highway was supposed to pass were high

mountains, steep cliffs and deep canyons, the engineering work was carried on in geat difficulty. Finally the project was given up by the Japanese in the middle of construction. After the restoration of Taiwan, The Chinese Government considered that since the east part of Taiwan was poor, and the west part prosperous, the cross island highway would not only develop east Taiwan but also benefit the people in the mountain areas with the improvements of economy, communication and education. Moreover, plenty natural resources along the road, if developed, would increase the wealth of the nation. Also, the required man-power for construction and development could be furnished by the retired servicemen. Therefore, the Chinese Government decided to construct the cross island highway. The engineering work began in July 1956, and the whole cross island highway was completed in April 1960. It took four years and nine months to finish the job and spent NT$425,711,370 and US$ 1,398,000.

The east-west cross island highway starts at Tungshi (Taichung Hsien), along Ta Chai River toward the east, through Da-ching and Li-shan, crossing Ho Fuan mountain, passing Li-wu downwards through Quam Yu, Ho lieu and terminates at Taroko Gorge. This is the principal line and its total length is 194.1 kilometers. There are two branch lines, one starts from Lishan north-eastwards, along Ta Chai River through Vanshan, Sheng Kwang, Siryuan, Yarkow, then downwards along Tsosui River (in Ilan) through Surchi, Touchong, Tsailien and terminates at Ilan. The total length of this branch line is 111.7 kilometers. Another branch line

starts from Yarko (Hofuan Mountain) south westwards through Infoun and terminates at Wushar in Nantou. This is a subsidiary line and its length is 42.2 kilometers. The total length of the principal and branch lines altogether amounts to 348.1 kilometers. It is one of the most significant construction projects since the Chinese Government moved to Taiwan. Because of the beautiful and breath-taking sceneries, it has become an internationally famous sightseeing spot.

2. The system of highways: In Taiwan, the highways including provincial, county, village and private ones totaled 15,461.1 kilometers. The network is as follows:

(1) Round the island highway system: It is divided into east and west principal lines, totaling 1,106 kilometers.

(2) Cross island highway system: It is divided into north, central and south lines and one branch line, totaling 640 kilometers.

(3) Inland highway system: There are Taipei-Pingtung, Hsingchu-Tainan and Taichung-Chishan lines, totaling 978 kilometers.

(4) Coastal highway system: The lines along east and west coasts of Taiwan, totaling thirteen lines with an aggregate length of 711 kilometeers.

(5) Linking highway system: highways linking the above highway systems, totaling 20 lines, altogether 497 kilometers.

Highway transportation in Taiwan province includes passenger and freight services. The handling of passenger

transportation is conducted by the Provincial Highway Bureau, city bus administrations and private bus companies.

The handling of freight transportation is solely in the hands of private transportation companies. In 1969, the highway passenger traffic on the island amounted to 1,041,062,000 persons and the number of passenger-kilometers was 9,862,000,000. The freight transported amounted to 31,612,000 tons and 1,169,000,000 ton-kilometers.

3. Taiwan Provincial Highway Bureau: The principal functions of Taiwan Provincial Highway Bureau are engineering, transportion and supervision. Its general duties are as follows:

(1) The Engineering Division:

Its chief functions are engineering planning, maintenance of roads, improvement of facilities, and building of new roads. The highways of Taiwan, since the Restoration Day have been expanding rapidly with a result of 42.6 kilometers per 100 square kilometers. High class highways have also been constructed occupying 34% of the total mileage of all highways. The maintenance of highways is conducted by different units. The provincial highways, 2,241 kilometers, are maintained directly by the Provincial Highway Bureau. The important county and village highways, 3,200 kilometers, are also maintained by the Provincial Highway Bureau, while the other county and village highways, 9,740 kilometers, are maintained by counties, villages and cities themselves under the supervision of the Provincial Highway Bureau. The private highways, 331 kilometers, are maintained by the

respective private companies.

(2) The Transportation Division:

In 1969, The Provincial Highway Bureau's monthly average mileage of passenger service reached 2,976.8 kilometers. The number of passenger cars reached 1,685, including 186 gasoline cars and 1,499 Diesel cars. In the same year, its transportation service totaled 233,591,367 Passengers and 3,446,645,390 passenger-kilomters. The average daily number of passengers carried was 639,976. If we take the index of 1952 as 100, then in 1969, it was 628.35. The provincial Highway Bureau has established 77 bus stations, 960 bus stops and 1,292 call stops. About maintenance facilities, there is one car repair factory, in charge of the maintenance work of 5th class, including body repair and body making, engine over-haul, spare parts reproduction and repair of 3rd maintenance yards, in charge of maintenance work of tires; 11 car repair shops in charge of maintenance work of 3rd and 4th classes; and 30 repair and maintenance stations, in charge of maintenance work of lst and 2nd classes.

(3) The Supervision Division:

The supervision responsibility has passed from the Ministry of Communications to the Provincial Highway Bureau through the Provincial Government. Its chief functions are the control of buses and drivers, the supervision of transportation service and traffic inspection. There are five supervision centers and 16 supervision stations. Various kinds of new equipment are provided, simplified application procedures and application by mail are employed in order to serve the public more efficiently.

4. Private highway or city transportation service: Private highway transportation service may be divided into two categories, i. e. passengers and freight. The passenger transportation service again may be divided into five categories, i. e. long distance passenger service, city bus service, sight-seeing service, large bus-for-rent service and small bus-for-rent service. The freight service includes ordinary freight service and special freight service (i. e. designated routes or designated freight). Other points may be described as follows:

(1) Long distance highway passenger service: The lines of private passenger transportation service chiefly are on county and village highways. The lines and fares are approved by the Provincial Highway Bureau. Because the lines connect towns and villages and the frequencies are high, they meet the requirements of the farming areas. The service performed by the companies is, as a whole, satisfactory. In 1970, the twenty five private bus companies had 2,279 passenger cars. The passengers transported amounted to 334,051,709. The daily average number of passengers was 915,210.

(2) Highway freight service: At the end of 1970, there were 1,491 highway freight service companies. The number of freight cars amounted to 16,329. The daily average tonnage transported was 99,826 tons.

(3) Special bus service: Rent car service and sight-seeing bus service are called special passenger car service. The large-size buses for rent and sight-seeing are equipped much nicer than ordinary passenger buses. A part of them have

been air conditioned, and they become an important means for the developement of tourism business. The service of small-size cars for rent is very popular even in small towns and villages. Averagely there is one taxi company of 8 taxis in 21 square kilometers. The service is good.

5. Future development plans:

(1) the 5th four-year economic reconstruction plan: Besides continuing the 4th four-year economic reconstruction plan, the future highway development plans are: (a) To improve the west trunk line, (b) To improve the east trunk line, (c) To improve the highway in the suburbs of Taipei, (d) To build highway between Yunsui and Michi, (e) To continue the construction of cross the sea bridge in Penghu, (f) To improve east-west cross island highway, and to build new highways including five lines from New Tou (Ilan) to Taitung, Sui Ming (Taitung) to Wutai, Shitso (Chiayi) to Tarpung, Dartsin (Kaohsiung) to Muling and Charshin to Shanming.

(2) To widen the west trunk line: The west highway trunk line through the important cities and towns of the west plain of Taiwan carries more than 1/4 of the total volume of passenger and freight traffic of Taiwan province. The tendency of development in the future rests on the widening of this line. Owing to the fact that the development plans of the cities and towns which this line links have already been mapped out, the expenses for widening this trunk line is high, and there may be technical difficulties in carrying it out. But in order to meet the actual repuirement,

it is necessary to select the most important parts and build them first.

(3) To build north-south eight-lane super-highway: Based upon the situation of transportation development, except the existing west highway should be widened, the west coastal area must have an 8-lane super highway to meet the future need. The Ministry of Communications has already organized a Highway Construction Bureau and has begun to gather funds, and to buy the land. The principal purpose of this plan is to increase the volume of passenger and freight traffic of the island. This super highway starts from Keelung to Funshan, totaling 375 kilometers. According to the degree of urgency, this highway is built by section in order of priority: Neihu-Yangmei, Keelung-Neihu, Tainan-Funshan, Yangmei-Hsinchu and Hsinchu-Tainan. In the first period, of the planning work of the Neihu-Yangmei section, the Shanchung-Chungli subsection has already finished. It is divided into 5 projects, which call for international bids. The construction will commence on lst July, 1971.

III. OCEAN TRANSPORTATION

1. Navigation companies: At the end of 1970, there were 79 private and government navigation companies, each having ships of more than 200 gross tons in the Republic of China. Among them, one was owned by the Central Government, one by the Provincial Government and 77 by private companies. Among the private companies, 46 were one-ship companies, or 58.2% of all companies.

2. Navigation lines:

(1) Regular lines.

(A) Sino-American regular lines: Ten Chinese ships are sailing regularly between Taiwan and American east coast; nine between Taiwan and American west coast with 2 to 3 voyages monthly. The number of ships for these lines is increasing and the quality of the ships and frequencies are improving.

(B) Taiwan-Japan regular line: Two ships are used on this line. For the requirement of exporting bananas, there are also 17 freezer ships sailing between Taiwan and Japan. Their return voyage carries groceries.

(C) South-east Asia regular line: Five ships are used on this line.

(D) Taiwan-Europe regular line: Five ships are used on this line with 1 to 2 voyages monthly.

(E) The Central and South America and Africa line: Four ships are used on this line with one voyage every month.

(F) Kaohsiung-Hongkong regular line: There are ten ships used on this line with 30 to 35 voyages monthly. In an average, there is one ship sailing every day.

(G) The Taiwan-Brunei regular line: At the beginning of 1969, due to the shortage of cargoes, only one ship was used on this line.

(2) Non-scheduled lines: Aside from the regular lines, there are 106 non-scheduled lines or about 62.35%

of the whole tonnage. The ocean transportation service depends upon the volume of export and import of the country and on the international situation. The areas of voyages cover (a) Japan, (b) The Philippines, (c) Central East Asia, (d) other areas such as Okinawa, South Korea, Australia, Brunei, etc. and (e) Between foreign countries such as PI–Japan, America–India, America–Japan, etc.

3. The transportation service:

(1) The volume of ocean transportation service: In 1969 the volume of ocean transportation service of this country amounted to 7,318,921 tons. Comparing to 6,340,176 tons in 1968, it increased 15.4%. In 1969, 29,948,500,000 ton–miles was transported. Comparing to 25,373,900,000 ton–miles in 1968, it increased 19.1%. In 1970, the cargoes transported amounted to 8,612,600 tons aggregating 44,411,658,946 ton–miles.

(2) The ratio of the exported and imported cargoes transported by the ships of the Republic of China was 32.1% of the total freight carried by all ships to and from this country. In 1969, it increased to 35.8%, and in 1970, it again increased to 37.4%.

4. The condition of ships: In order to develop the ocean transportation service, measures including the increase of shipping facilities and the modernization of ships, and the establishment of fine merchant fleets have been taken into consideration with serious efforts. The increase of tonnage of Chinese merchant ships in recent years is as follows:

(1) Ships of different navigation companies (above 200 gross tons) (from 1959—1970).

Year	Total			China Merchants Steam Navigation Company			Taiwan Navigation Company			Private Companies		
	No. of ships	Gross tonnage	Dead weight in tons	No. of ships	Gross tonnage	Dead weight in tons	No. of ships	Gross tonnage	Dead weight in tons	No. of ships	Gross tonnage	Dead weight in tons
1959	77	288,537	415,280	27	122,038	172,925	11	36,803	52,248	49	129,656	190,647
1960	83	347,173	503,586	23	115,231	164,555	9	40,534	59,494	51	191,407	279,537
1961	97	431,096	636,317	29	141,276	200,915	10	44,277	65,979	58	245,544	369,423
1962	103	485,977	691,866	24	124,744	176,568	10	44,480	65,471	69	316,753	449,827
1963	104	533,626	761,459	21	121,276	171,158	10	40,999	60,279	73	371,351	530,022
1964	124	673,547	884,632	24	194,991	214,048	11	44,078	62,939	89	434,478	607,648
1965	145	779,058	1,073,156	22	164,342	208,448	10	47,902	69.419	113	566,814	795,289
1966	143	710,665	1,004,531	19	135,250	192,327	10	47,902	69,419	114	527,513	742,785
1967	145	716,895	1,016,904	19	130,867	184,972	11	52,423	74,938	115	533,605	756,994
1968	164	900,497	1,274,084	18	129,494	184,907	13	73,504	104,816	133	697,499	984,361
1969	174	1,008,697	1 490,132	21	204,281	316,981	11	67,707	93,814	142	736,709	1,079,337
1970	170	1,129,915	1,716,431	21	298,673	496.593	11	67,935	95,817	138	763.306	1,124,020

(2) Freight transportation of the shipping companies (1959–1970)

Year	Total		China Merchants Steam Navigation Company		Taiwan Navigation Comyany		Private Companies in Taiwan	
	Cargo transported in tons	Cargo transported in tonnautical miles	Cargo transported in tons	Cargo transported in tonnautical miles	Cargo transported in tons	Cargo transported in tonnautical miles	Cargo transported in tons	Cargo transported in tonnautical miles
1959	2,545,735	9,645,922,997	1,071,986	5,453,256,871	403,444	896,201,459	1,070,305	3.296,464,667
1960	2,795,738	11,760,357,673	934,536	5.475,543,843	426,381	949,565,207	1,434.821	5,335.248,623
1961	3,195,074	14,763,510,142	1,009,862	5,534,122,750	404,046	968,747,764	1,781,166	8,260,639,628
1962	3,568,241	16,954,885,905	1,033,335	5,557,911,125	378,105	1,076,842,570	2,156,801	10,317,132,210
1963	3,873,317	15,045,936,711	922,679	4,600,255,687	426,191	1,145,772,144	2,524,447	9,299,908,880
1964	4,989,383	20,993,514,345	1,129,198	6,299,795,388	377,212	1,025,744,374	3,482,973	13,667,974,583
1965	5,886,976	27,304,641,030	1,104,025	6,732,298,117	448,645	1,164,351,482	4.334,306	19,407,991,431
1966	5,888,192	25,382,454,210	1,213,386	6,971,799,189	415,554	1,165,780,389	4,259,252	17,244,874 632
1967	5,658,446	22,355,384,297	1,157,495	6,242,701,915	556,149	1,503,484,047	3,944,802	14,609,198,335
1968	6,340,176	25,373,860,401	1,309,898	7,240,436,309	581,279	1,713,152,779	4,448,999	16,420,271,313
1969	7,318,921	29,948,520,827	1,296,762	6,045,073,434	782,655	3,118,360,629	5,239,504	20,785,086,764
1970	8,612,623	44,711,658,946	1,204,344	9,043,026,560	904,439	3,468,272.232	6,503,840	32,200,360,154

(3) Different kinds of ships:

Kinds of ships	The end of 1962		The end of 1968		The end of 1969		The end of 1970	
	No. of ships	Dead weight in tons	No. of ships	Dead weight in tons	No. of ships	Dead weight in tons	No. of ships	Dead weight in tons
Dry Cargo ships	92	413,325	128	1,007,177	97	967,015	83	943,779.21
Passenger Cargo ships					1	12,380	1	12,380.55
Oil tankers	9	68,163	7	115,615	8	215,400	10	416,612.55
Freezer ships	1	3,892	20	82,643	17	76,767	17	76,887.55
Lumber ships			5	29,550	16	106,889	20	132,838.60
Sugar ships			1	2,438	1	2,438	1	2,437.55
Semi-Container ships			3	36,700	5	62,044	7	87,672.00
Container ships							2	2,444.00

5. The renovation of Chinese shipping service:

(1) To carry out the modernization program: The 1st phase of the merchant ships' modernization program including the building of 9 new ships (69,600 tons of dead weight) began in 1961. The 2nd phase began in 1966, consisting of the building of 8 new ships (113,000 tons of dead weight). The 3rd phase started in 1968 including the building of 8 new ships (177,500 tons of dead weight). The 4th phase began at the end of 1968, consisting of the building of 16 new ships (203,500 tons of dead weight). The above plans of building new ships were completed and ships were all delivered. In May, 1970, in order to expedite the modernization of ships, the 5th 4-Year Economic Reconstruction Plan promulgated the 5th phase of building new ships with a dead weight of 140,000 tons and to buy some good new ships. From now on the new ships are going to be either purchased or built. It is expected that when the 5th Economic Reconstruction Plan was completed in 1971, our merchant ships will exceed 1,700,000 tons of dead weight and the average age of ships will be reduced. They will be able to fulfill the mission of developing our foreign trade in the future.

(2) To expedite container transportation:

(A) Five whole container ships will be built to sail on the Sino-American West Coast line. They will be operated jointly by CMSNC, TNC, China Navigation Company, Yi-Lee Steam Navigation

Company, and Foshing Navigation Company. The ships will depart from Taiwan and America at the same time once every week or ten days.

(B) To construct special piers for container ships. In Keelung one special pier for container ships will be completed which can berth 2 container ships at the begining of 1971. In Kaohsiung, there was one container ship pier already completed in May, 1970, which can berth two container ships. These special piers are enough for the current use of the container ships of our own and those of foreign countries.

(C) To construct container yards: China Container Transportation Company was organized by the navigation companies, the Provincial Government and inland transportation services. The container yard in Keelung (in the vicinity of Wu-Tu) was completed at the end of 1970 and began to operate in June, 1971. The container yard in Kaohsiung is also under construction. Now the container transportation system has been established and can handle the traffic without difficulty. They will offer the "door to door" service.

(3) To build more special type ships. In 1962, this country only had 9 oil tankers totaling 68,000 tons of dead weight. At the end of 1970 the number of oil tankers increased to 10 and the dead weight in tons increased to 416,000. In 1962, there was only one freezer ship with 3,900 tons of dead weight, now there are 17

freezer ships with 76,000 tons of dead weight. We had no lumber ship and container ship in 1962, but now there are 20 lumber ships with 132,000 tons of dead weight, 7 semi-container ships with 87,600 tons of dead weight and 2 full container ships with 21,000 tons of dead weight.

(4) To improve the capabilities of ships. The average ages of Chinese ships were: 16 in 1967; 14 in 1969, and 9½ in 1970. The average speeds were: 13.5kts in 1967, 14kts in 1969, 15.5kts in 1970.

6. Future development program:

(1) Purchasing and building a merchant fleet of good capability. According to the statistics of recent years, the volume of import and export cargoes has been increasing year after year. The average annual increasing percentage was about 12%. In 1972 the volume will approach 20,000,000 tons. Our merchant fleet should at least ship 50% of the total. Also, we should modernize our ships and reduce the age of them. It is planned to purchase and build new ships of 830,000 tons of dead weight in the 5th 4-Year Economic Reconstruction Plan. In 1972, our merchant fleet should be expanded to 1,723,000 tons of dead weight.

(2) To improve shipping service, to strengthen the joint management system, and to stimulate the amalgamation and cooperation of small companies.

(3) To meet the requirements of our traders and open new scheduled lines, and to give priority in shipping to our own export and import cargoes.

IV. HARBOURS.

1. Keelung Harbour

(1) Existing facilities

There are 31 berths of deep water piers, 12 berths of shallow water piers and 30 warehouses and transhipment godowns with a gross storing capacity of 287,000 tons. The equipment for loading and unloading consists of 3 floating cranes, 16 pier electric operated cranes, 12 land cranes, 2 gantry cranes, 163 fork lifts, 3 side-loading lifts, 1 25-ton trailer, 2 vacuum grain conveyer, 1 load shovel, 1 magnetic hoisting disc and several tractors. There are 2 large-size tugs (newly added in 1968 and 1969,) 4 medium-size tugs and 11 small-size tugs. There are 1 self-navigation sucking type dredger (Tung-Hai), 1 sand-sucking dredger and 5 auxiliary dredgers. Other service tenders include 4 water tenders (one is newly built of self propelling type with a capacity of 200 tons), 2 rabbish depositing tenders and some other fire-fighting, patrol and stonedepositing boats.

(2) Engineering construction

A. Breakwaters and tunnels: Two-thirds of the east and west breakwaters of the outer harbour was completed in the Japanese days. The damaged part by bombardment was repaired in 1949, but the unfinished part was still in deep water. The construction work was very difficult because of the rough sea. After a struggle of four years, it was completed in 1953. The east breakwater was prolonged to 38 meters and west breakwater to 170 meters. Also two light houses of reenforced concrete were attached. This is the

gate to Keelung harbour. Two "east and west" minor break waters were under construction. The west one was completed in 1966, and the east one in 1968. These breakwaters form the second entrance to the Harbour. In order to offer the sightseeing service, one light-house, called Kuanghwa Light House, was built on the west inner breakwater. It was started in 1965 and completed in Oct. 1967.

In 1955, the piers in Keelung outer harbour were partly completed. In order to facilitate freight transportation, a tunnel called Foshing Tunnel, was constructed. It was completed in 1956. In 1966, because of the completion of the piers in outer harbour, the volume of cargo traffic increased immensely. The original tunnel could not meet the need and the second one was built. It was completed in 1968 and named Kuanghwa Tunnel.

B. The construction of piers: In 1954, Piers numbers 29 and 30 were under construction and completed in 1956. This was the first time that deep-water piers of Keelung Harbour were constructed after Restoration. The deep water piers numbers 31 to 33 were begun to construct in July, 1961. They were completed in 1964, 1965 and 1966 respectively.

Since 1963, the volume of cargo transportation in Keelung Harbour has been increasing sharply. The average yearly increase is about 500,000 tons. Therefore the construction of additional piers was deemed necessary. In 1965 the improvement of east side shallow water piers was under construction. The construction of the first stage

began in July 1965, and was completed at the end of 1967. Three deep-water piers and one shallow-water pier were constructed. At the same time, No. 11 shallow-water pier was converted into deepwater pier in order to facilitate the mooring of big ships. The construction of the second stage began in July 1967, and was completed in June 1969. Two deep-water piers were constructed. The construction of the third stage began in 1969 and is scheduled to complete in October 1971. Four more piers will be built.

In order to meet the development of shipping service, the following construction and conversion projects were undertaken: (a) No. 29 pier was reconstructed (July 1966 to June 1967) (b) No. 19 pier was converted into No. 20 deep-water pier (July 1967-end of 1969) (c) Inside the east breakwater, on Tungpan island, a dangerous cargo pier of 2 berths was constructed to replace the above mentioned No. 19 pier (July 1969-the end of 1969).

In 1969, the tendency of the world shipping service was to emphasize container ships and lighter on board ships. In order to match the requirement the finger pier was under construction in the outer harbour at the beginning of 1969. It consists of 8 deep water piers, 6 of them (from No. 21 to No. 26) are for container ships and 2 (No. 27, and 28) for lighter on board ships. These piers will be completed in 1972.

C. Warehouse and transhipment godown: In the early days of Taiwan restoration, emphasis was laid on warehouse repairing and maintenance. In 1950, one transhipment

godown was built for the first time, i. e. No. 4 transhipment godown. In 1955, only one dangerous cargo warehouse was built near No. 19 pier and one 10,000 tons grain elevator was built near No. 30 pier. They were completed in 1956. Also on the left and right sides of No. 30 pier, a 5,000 ton and a 6,000 ton grain elevators were built. They were completed in 1958 and 1959 respectively.

Because of the completion of many piers in outer harbour, there was a great need of warehouses and transhipment godowns for storage and transfer of cargoes. In 1964, in outer harbour behind the 10,000-ton grain elevator, there were 8 circular warehouses built with a capacity of 5,000 tons. At the end of 1964, No. 32 transhipment godown was built with a storage capacity of 22,500 tons. At that time it was the largest transhipment godown of newest type in the Far East. It was completed in June 1966. In addition, one transhipment godown near No. 20 pier was completed at the beginning of 1970; 2 dangerous cargo transhipment godowns were completed by the end of 1969; and 2 grain elevators were built in 1969, one of the elevators was near completion at the end of 1970 with a capacity of 7,500 tons while the other will be completed in March 1972 with a capacity of 28,000 tons.

The first period of the construction of the east side of Keelung Harbour began in July, 1965. Three transhipment godowns (East No. 2, East No. 3 and East No. 4) were built. They were completed in 1968. In the second period, the East 6 transhipment godown was built and completed in

1969. Near these transhipment godowns, there was one 5-story building for passengers. It is a modern one in the Far East. Inside the building it exhibits our ancient cultural heritages and our fine arts. Electrical and mechanical equipment was provided for the convenience of passengers.

Because of the rapid increase of shipping cargoes and the rather long time taken for building additional warehouses and transhipment godowns to store and transfer cargoes, the cargo sheds were built between piers in order to accommodate the surplus cargoes temporarily. In 1961, one banana shed was built near No. 7 pier. In 1963, one coal shed was built near No. 8 pier. In 1965, 2 cargo sheds were built near No. 30 pier. In 1966, two cargo sheds were built near No. 8 & No. 18 piers respectively. In 1969, 2 cargo sheds were built by the side of the dock.

D. Other constructions: Since 1964, some other constructions were undertaken, such as one machinery and tools building, one ship engines building, one harbour service building, one harbour police building, 2 machinery and tools stations, 3 waiting stations for workers, 386 family houses and 110 harbour police family houses.

2. Kaohsiung Harbour

(1) Existing establishments and facilities

There are 38 deep-water piers totaling 6,759 meters, which can berth 48 ships of 3,000 to 20,000 tons, 54 warehouses totaling 234,821 square meters, which can accommodate cargoes of 348,866 tons, and 20 warehouses on the

second line, totaling 18,893 square meters which can accommodate cargoes of 21,146 tons. The equipment for loading and unloading are 6 floating cranes of capabilities from 25 to 60 tons, 128 fork lifts of capabilities from 1–3 tons, and 90 tractors of capabilities from 6 to 30 tons.

(2) The completion of expansion program of Kaohsiung Harbour

The expansion program of Kaohsiung harbour began on September 18, 1958 on the ilse of Chinchen. The original plan was divided into 3 stages within 12 years. Also, the detailed projects for the construction work of each stage were mapped out. The original idea for the expansion was to fully utilize all water areas of Kaohsiung Harbour. However, owing to the rapid economic development of the country, the expansion of Kaohsiung Harbour helped immensely the development of industries in southern area, and it was necessary to have a second harbour. They have made Kaohsiung a great industrial city as to-day. The expansion construction work of Kaohsiung Harbour was to dredge shallow waters into deep waters, to facilitate the big ships to navigate and moor. Again, they utilized the earth digged out from shallow waters to reclaim new lands. In the first period the fish-pond shallow beach of Chi Chen River was filled up. 228 hectares of new land were reclaimed. The famous Export Processing Zone with many private industries established there and engaged in production and earning money for the country, is located on this new land. Also, in the first period 6.39 kms. navigation routes were dredged to prolong the principal routes eastwards. There were 5,922 kilometers of quay wall, 225 kms. of deep

water pier and 2 passage bridges to build. Most of them were completed ahead the schedules. The five years from 1958 to 1963 made Kaohsiung a great industrial city.

In the second stage of the 3-year construction program, 2.90 kms of navigation routes were dredged. More than 3,000,000 cubic meters of mud were digged out and a new land of 159 hectares reclaimed. Now the Tang Yung Steel works, the fishing harbour in Chichen, and the permanent container piers which will soon be built are all located on this new land. In addition 2,296 kms. of quaywall were built.

The third stage of the 4-year construction program was scheduled to complete in June 1970, but it was completed on 18 June 1969, one year ahead of the scheduled time. The total construction works in these eleven years were 522 hectares of new land filled up, 14,100,000 cubic meters of mud digged out. 8.29 kms. of quay wall built, 10.19 kms. of navigation routes dredged, 225 kms. of piers and 2 passage bridges built. The money spent for these expansion construction projects amounted to NT$ 374,000,000 which was about NT$ 170,000,000 less than the NT$ 548,000,000 originally budgeted. Truly this is one of the greatest accomplishments of economic reconstruction of the nation.

About Kaohsiung Harbour itself, owing to the expansion program, 50 piers and 100 warehouses were added. As a result, the ships are no longer too crowded in the harbour and the harbour service income also increased several times. In addition, the construction of the container ship piers makes the service of Kaohsiung Harbour up-to-date. The expansion

of Kaohsiung Harbour has a far-reaching effect. Its impact reaches Funkung in Kaohsiung District, and Tung Kuang in Pingtung District, including the areas of Hungmu Kuang, Shaukuang and Tarlinpu. Therefore the southern industrial area of Taiwan becomes the finest light and heavy industry bases. It includes 4 industrial areas, 3 fishing harbours, 1 integrated steel mill, one 50,000 ton floating dock oil harbour area, and 1 petro-chemical industry area.

(3) The development of the merchant harbour in Mid Isle.

The first stage of the expansion construction program of Kaohsiung Harbour was completed in 1963. There were 228 hectares of new land filled up. Except for the use of industry area and the export processing zone, one new merchant harbour was built in Mid Isle. This new habour covering 73 hectares, is facing water on 3 sides, around the export processing zone and adjacent to the Kaohsiung industry areas. The harbour coastal line totaled 5,400 meters. The development plan of the new harbour calls for the building of 27 deep water piers, 1 lighter pier, 10 double-story warehouses, 10 single-story transhipment godowns, 3 transfer warehouses, 7 double-story transhipment godowens, 1 banana freezer warehouse, 1 grain elevator with a capacity of 80,000 tons and 7 filling up storages. The above planned construction projects except 1 lighter pier and 1 deep water pier already completed in the expansion construction program of the first stage of Kaohsiung Harbour, are included in the plan of construction of the new merchant harbour. They will be completed in 1973. In addition to facilitating the berth of

containerships, it has been decided to build a container center on the unused land of 7 hectares behind the piers of Nos. 40, 41, & 42 in the projected part of the new merchant harbour area.

(4) The construction of a second entrance.

The configuration of Kaohsiung Harbour is narrow and long. The length of navigation route is about 12 kms. But there is only one entrance. The big ships can not come in. Also both sides of the entrance are steep rocks. If there is any damage done at the entrance, it is quite easy to block the harbour. Moreover, since the completion of the expansion construction program of the harbour, the number of ships going and coming has been increasing rapidly and the entrance is very crowded. Therefore the construction of the second entrance is planned and the engineering work has started.

The position of the second entrance is between Hung Mon Kuang and Chung Chow and 9 kms. apart from present entrance. At the beginning of 1967, the government approved the establishment of the engineering division of the second entrance under the Kaohsiung Harbour Bureau to take charge of the engineering work. On 29th July, a ceremony was held to mark the start of this job. The following items are included in the plan. The width of the entrance is 250 meters. The width of navigation route in the outer harbour is 160 to 220 meters and the length is 2,750 meters. The width of the navigation route in the inner harbour is 180 meters and the length is 2,500 meters. The length of the maneuvering space

is 500 meters. The planned depth is ( ) meters below low waters. The primary requirement is to enable ships of 75,000 tons passing through. In order to match the development of heavy industries in the future, the navigation route can be dredged deeper to enable oil tankers of 100,000 tons passing through. As the east coastal line from Hung Mon Kang to Chung Chow is quite straight and flat, it is necessary to build in north and south 2 breakwaters to maintain a relatively calm surface inside the entrance. The length of the southern breakwater is about 2,135 meters, and the northern is 1,153 meters. The distance between the 2 breakwaters is 350 meters. The amount of mud to be digged out for opening the navigation route is about 26,000,000 cubic meters. The scheduled time for completion is 8 years. It will be completed in June 1975. The total amount of engineering cost is estimated at NT$1,414,000,000. The funds will come from the 0.75% of the surcharge of harbour tax. At the end of 1970, it had reached the fourth fiscal year, and the engineering work had nearly half completed. The principal engineering items now under taking are as follows:

(1) The principal engineering works in 1970 (The 3rd FY) are to build 480 meters of southern breakwater, to dig out for navigation routes 2,000,000 cubic meters, to construct 1 ferry pier, to build 2 working vessels and to construct working spaces of 800 square meters. Except the progress of the breakwater in deep water is a little behind the schedule, because of using 24 meter circular shaped floating caissons, the other items have all completed in the year.

(2) The principal engineering works in 1971 (the 4th FY) are to build 539 meters of breakwater, 220 meters of southern quaywall, 1 car carrying ferry boat, and to prolong the ferry pier. The engineering work of the first stage of No. 9 dock is to dredge navigation routes of 2,000,000 square meters. In addition, the building of houses for staff families and the purchasing of one 1,600-cubic-meter self-propelled dredger are well underway. By the end of 1970, the total accomplishments are 3 kms. of road for engineering purpose, 1 caisson dock, 1 temporary breakwater, 6,300 square meters of working spaces and rooms, 14 working vessels, 6,000,000 cubic meters of mud and sand along navigation routes digged out, 210 meters of rubble on the southern breakwater and 150 meters on the northern breakwater mounted, 18 stands of 17-meter circular-shaped floating caisson of south breakwater installed with 306 meters, 32 stands of 24-meter circular-sharp floating caisson under construction, 8 stands installed, and the other 12 stands also under construction. The total engineering progress has reached 30%.

The standard of the second harbour originally was planned for the ships of 75,000 tons with bulk loading passing through. But in view of the speedy development of international shipping service, the oil tankers become larger and larger. At the time of completion of the harbour, the original standard may be already unable to meet the actual needs of shipping service. Therefore a revised plan was made to improve the standard so as to enable oil tankers of 100,000 tons passing through. The contents of the revised plan are as follows:

A. Navigation routes: The navigation routes in the outer harbour to be prolonged to 3,000 meters, dredged to a depth of ( ) meters, but the width will not be changed. Owing to the delayed arrival of the newly purchased dredger, in this engineering period, the first stage is to dredge the routes to an average width of 140 meters and then to widen it again afterwards.

B. Breakwaters: Owing to the increased depth of navigation routes, the breakwaters must also be prolonged. The southern breakwater was prolonged to 2,287 meters and the northern to 1,403 meters totalling 3,690 meters.

C. Ship basin: It was planned to build one ship basin in the southern side of the second entrance to facilitate the berthing of working vessels, ferry boats and fishing vessels.

The time for engineering construction is 8 years. Although the plan was revised for the improvement of standard, it will be completed at the end of June 1975. The cost is estimated at about NT$50,000,000. The harbour area will be about 6 times the size of the present one. Kaohsiung Harbour will be one of the most modernized harbours in the world. (July 1972)

TRANSPORTATION ECONOMY OF TODAY

By Prof. Wang Kuang

Introduction

From the standpoint of the users, what they need for transportation are speed, regularity, safety, comfort, mass movement, and cheap rates. However, from the shippers' point of view, another essential factor, i. e., low cost, should be added thereto. If an optimum balance of subjective and objective views on these factors could be kept, transportation would be invariably able to achieve its greatest efficiency and success. Consequently, all the new measures implemented in the world transportation today are geared toward this direction to meet the realistic requirement. This may be expounded as follows:

(1) Civil Air Transport Dominating International Passenger Service

The tempo of international travel has reached a crescendo in recent years. Before the Second World War, most people took the sea voyage. Since the advent of jet planes, the greatest majority of international passengers like to travel by air. (The speed of a fastest ocean liner per hour is less than 32 miles, while that of Boeing 747 plane reaches as high as 625 miles). The total number of world's air passengers was only 80,000,000 in 1957. Twelve years later the number soared to 287,000,000 totaling 348,000,000,000 passenger-kilometers. Also showing a staggering increase was the volume

of air freight traffic which recorded 10,340,000,000 ton-kilometers in 1969. The total volume of air traffic in the same year including passenger, freight, luggage, and mail aggregated 43,460,000,000 ton-kilometers. From 1960 to 1969 the average increase of global air traffic each year was 12 per cent in number of passengers, 14 per cent in passenger kilometers, 19 per cent in freight ton-kilometers, 17 per cent in mail, and 15 per cent in total ton-kilometers.

Speaking of the earnings of international civil air lines, the picture was not so rosy for a few years around 1960 mainly because huge investments were made at that time for the purchase of large jet planes, and the percentage of pay-load was comparatively low. As a result, the total loss of all world air lines amounted to US$ 140,000,000 in 1961. Since 1962, with the increase of pay-load percentage, they were no longer in the red. The amount of profit was US$ 326,000,000 in 1963, US$600,000,000 in 1964, and again increased to US$ 1,065,000,000 in 1967. To keep pace with prosperous business, new planes were bought, and new routes were inaugurated. The China Air Lines has also been moving fast in these years. However, with a view to competing successfully with other air lines, further support is required from both the Chinese Government and people for its rapid progress and development.

(2) The Trend of Civil Air Transport Development

In the foreseeable future, the trend of civil air transport development may be mentioned as follows:

a. The speed, navigable range, and percentage of pay-load will show a remarkable upsurge.
b. Passenger fares will be lowered, but new services will be added to enhance the comfort of passengers.
c. The volume of passenger and freight traffic will continue to make a staggering air increase.
d. Keener competition will force the air lines to merge or to work jointly in the ways of profit-sharing, expenditure-sharing, and common use of flying equipment.
e. The increasing use of automatic and electronic flying facilities will ensure greater air safety.
f. The government will have to allocate more funds for the expansion and improvement of airports and flying facilities.

(3) Freight Traffic Becomes The Backbone of Ocean Transportation

It is a patent fact that because the speed of ship is comparatively slow, both business and pleasure travellers like to go by air. The world-famous passenger liner, the 80,000-ton Queen Mary, was forced to cease operation three years ago. It became a floating museum at Long Beach, U. S. A. Her sister ship, the Queen Elizabeth, also stopped to function in the following year. Mr. C. Y. Tung, a shipping magnate, bought the ship and intended to have it converted into a floating university Unfortunately, it was completely destroyed by a fire in Hong Kong in January 1972. Other passenger

liners are attempting to attract international tourists and immigrants, but they can never make two ends meet and have to rely upon government subsidies.

On the other hand, the ocean freight traffic has made a substantial and rapid development in recent years. In 1962 cargoes transported by sea totaled 1,200,000,000 tons. The volume of freight traffic soared to 1,600,000,000 tons in 1965, and again jumped to 3,000,0000,000 tons in 1970. As a result, cargo ships have been in great demand, particularly oil tankers.

(4) Sharp Increase of Oil Export and Large Number of Mammoth Oil Tankers

The export of oil from oil-producing countries hit a record high of 1,263,000,000 tons in 1970. In consequence, there was an urgent need of oil tankers. According to the statistics of the same year, out of the 227,489,864 tons of world's merchant ships, 86,139,853 tons belonged to oil tankers. It is note-worthy that 38 per cent of the oil tankers aged less than 5 years. Because the oil tankers are bound to have empty returns and their voyages, as a rule, are of very long distance, it is considered more economical to use large ships. During the Second World War, the carrying capacity of oil tankers seldom exceeded 30,000 tons. Today a Japanese oil tanker has a staggering tonnage of 372,000.

The Republic of China now owns four 100,000-ton oil tankers which barely cover the need of Taiwan. It is imperative that our Government should assist the private shipping companies to build more large oil tankers in order

to compete with other countries on international waters. The carrying capacity of oil tankers should be limited to 220,000 tons. Any ship larger than this would no longer be economical and must not be built.

(5) Bulk Carriers Mainly Used For Tramp Freight Service

Aside from oil, major items of international trade are foodstuffs, minerals, and coal usually shipped in hundreds of thousands of tons in one lot. In pre-war days, these commodities were transported by ordinary cargo ships which could only carry a limited quantity and at high rates. After the Second World War, specially-designed bulk carriers were built and soon in great demand. According to the statistics of July 1968, there were 18,910 merchant ships in the world exceeding 10,000 tons totaling 176,523,000 tons. Out of these figures, 2,496 were bulk carriers with a total tonnage of 34,204,000. Evidently, the bulk carriers have become the main revenue earners of tramp freight service. Although the Chinese shipping companies have realized the importance of bulk carriers and built a few in recent years, they are far from being able to compete successfully in the world market.

(6) Container Ship Has an Unrivalled Position in Regular Shipping Service

The container ship is used solely to carry cargo containers. With the special loading and unloading facilities aboard and at the wharf, cargoes are handled swiftly and safely. Furthermore, container ship renders a sea-land door

to door service. In a short span of less than a decade, container ship has almost taken the place of ordinary cargo ship in major shipping lines between Europe and America, America and Asia, and Australia and Europe. By the end of 1970, 178 container ships were in operation and 140 were under construction each carrying 700 to 1,200 containers. (Eight large-size full container ships of Ta Ho Class recently built by Mr. C. Y. Tung each carries 1,200 standard containers.) The Sea-Land Service, Inc. of the United States, a pioneer of container shipping service, has 44 container ships with a total tonnage of 540,000 actually monopolizing the sea-land through traffic market of the world. The Republic of China now has 9 container ships and semi-container ships. Because the building cost of container ship is too high, it appears difficult for us to make a substantial increaes of the number in the foreseeable future. To achieve a successful result on this score, joint effort of both the public and private sectors is necessary.

(7) LASH May Relief Harbour Congestion

Harbour congestion has posed a serious problem in major ports of the world today. To cope with the situation, a Lighter Aboard Ship (LASH) was invented. The first LASH of 43,000 tons owned by a Norwegian and rented to an American shipping company was completed in Japan in September 1969. It can carry 76 lighters on deck and inside the ship. LASH uses its big cranes to pick up loaded lighters onto the ship and discharge them upon arrival at the

destination. The lighters are immediately tugged to the water-front warehouse of the consignee.

The advantages of LASH are as follows:

a. It reduces the loading and unloading charges originally paid to the longshoremen.
b. It is not necessary to moor LASH at a pier when piers are not available.
c. The draft of the lighter is shallow, thus LASH can call at harbours where the water is not deep enough for big ships.
d. Lighters can be tugged to any places specified by the consignor or consignee to effect door to door shipping service.

The first LASH called at Keelung was the one belonging to the Pacific Far East Shipping Company. It has a deadweight tonnage of 26,000 and a speed of 23 knots per hour carrying 49 lighters and 343 containers. At present LASH is sailing regularly on the world's six major lines. The current number of LASH in operation and under construction is 22 ships totaling 800,000 tons. Since we have already invested a large sum of money in building a LASH wharf in Keelung, it behooves us to move fast in this connection to forestall a monopoly by foreign shipping companies.

(8) The Standardization of Railway Guage

It is evident that if the gauges of different railways were different, locomotives and cars would be impossible to run from one railway to another. In other words, no through

traffic of railways can be carried out thus affecting adversely the efficiency of transportation. The reasons attributed to different guages are more than one. The railways built in various countries, or even built in the same country, were not started at the same time. For instance, some were built in colonial days, and some were built on foreign loans at the time to meet the realistic demand of optimum economic development. The standard railway guage is 4 feet and 8½ inches commonly used in the United States, Canada, Great Britain, Germany, France, the Netherlands, Belgium, Italy, and Mainland China. The guage of 3 feet and 6 inches is used in West Taiwan, Hawaii Islands, Japan, the Philippines, New Zealand, South Africa, Sudan, Norway, and Peru. Three feet guage is used in Mexico, Cuba, and Columbia. East Taiwan railway uses 2 feet and 6 inches guage. Meter guage is used by railways of Yunnan–Vietnam Line, Szechuan–Yunnan Line, Yunnan–Burma Line, Nan Chen Line, Vietnam, Burma, Thailand, and Malaysia. All these are called narrow guages. Broad guage of 5 feet is used in Russia, Czechoslovakia, Turkey, Finland and Panama; 5 feet and 3 inches is used in Ireland; 5 feet and 6 inches is used in Spain, Portugal, Pakistan, Chile, and Argentine. The railway guages used in India are most complicated including those of five feet and six inches, one meter, and two feet and six inches. This is due to the fact that before her independence, the British Government only considered its own piecemeal interest and ignored the overall economic development program of the colony. In Australia, the railway guage used in Queensland and West Australia is 3 feet and 6 inches, in New

South Wales and Pan Australian Railway 4 feet and 8½ inches, and in Victoria and South Australia 5 feet and 3 inches. A few years ago, travellers from Sydney to Melbourne had to change cars at the railway junction of two states because prior to the founding of the Australian Federal Government, each state was independently ruled by the British, and each built its own railway of different guages. Now India and Australia are planning to standardize their railway guage, but a tremendous amount of money and a very long time would be required to have the project implemented. The Australian Government has decided to use ten year's time to convert the different railway guages into a standard 4 feet and 8½ inches one. In Japan the guage used in practically all the trunk line railways is 3 feet and 6 inches. Due the rapid development of Japanese economy in the recent decade, the narrow guage railways can no longer meet the realistic requirement, particularly the line between Tokyo and Osaka. In consequence, a complete new railway of standard guage was completed in October 1964. It not only streamlines the movement of passenger and freight traffic, but also achieves a maximum speed of 210 kilometers per hour for passenger trains. In view of its wonderful success, the Japanese Government ordered that all new railways to use standard guage, and all the old railways of 3 feet and 6 inches guage be changed to standard guage from time to time.

It the case of Taiwan, as a means to develop East Taiwan's economy, the existing 2 feet and 6 inches guage

railway and the projected south bend and north bend railways should all use 3 feet and 6 inches guage in order to standardize the guage of the entire round-the-island railway system, and enhance the efficiency of transportation.

(9) The Economy of Using Electricity and Diesel Oil as Railway Motive Power

In developed countries the choice of using different kinds of motive powers for railways hinges on the volume of traffic. Generally speaking, it is more economical to use electricity as motive power for large volume of traffic, and use diesel oil for small volume. Because the thermal efficiency of steam locomotive is low, it is no longer used in most countries now. Since 1954 the United States has stopped the building of new steam locomotives. In 1959 there were only 1,350 steam locomotives in the United States; presumably none is now in use on the American railways. Japan had 3,148 steam locomotives in 1966 which will be replaced by electric and diesel oil locomotives in 1975.

The economic demarcation point of whether using electricity or diesel oil as railway motive power is determined by their prices in different countries. For instance, the demarcation point used by French railways is 225,000 kilowatt hours per kilometer per year, while that used in Germany is 200,000 kilowatt hours. Japan uses 20,000 tons per kilometer per day or 90 trains per day as the demarcation point. In Taiwan, the west line transported 40,000 tons each day in 1966 which is equivalent to the use of 365,000 kilowatt hours per kilometer per year far exceeding the economic demarcation

point of the above-stated countries. Taiwan produces only a small quantity of oil. We buy crude oil from the Mid-East nations thus spending a lot of foreign exchange every year. If the source of oil supply being cut, the price of oil would skyrocket almost immediately. According to the estimate made by a Japanese expert in 1960, Taiwan Railways had to use 420,000 tons of coal per year. If the coal were used to generate electricity, we could get 820,000,000 kilowatt hours of electric power. If electricity were used as railway motive power, only 210,000,000 kilowatt hours would be required. In other words, to electrify Taiwan's railways, we could save 3/4 of our energy resource. Technically, the trend of railway renovation in many countries today is geared to automatic operation. Electrified railways can best achieve this purpose.

Based on the above-mentioned three reasons, to electrify Taiwan Railways should be the most economical and most efficient means of renovation. It is gratifying that the Chinese Government has decided to take a positive step toward this end. The project is scheduled to be implemented in 1977.

(10) Transportaion Terminals to be Used as Commercial Complex

Transportation terminals such as railway station, civil airport, harbour, and highway bus station are often centers for tens of thousands of passengers to conglomerate every day. For example, the Shinjiku Railway Station in Tokyo has more than one million passengers in a day. Others like the international airport of New York, ocean terminal of Hong Kong, and union bus stations of American big cities

are all jammed with people. These places become the ideal centers for shopping and recreation.

In recent years, for the sake of raising enormous sum of money to build terminals, many transportation agencies, more often than not, enlarge the scope of construction. Aside from using a part for their own purpose, a vast space is reserved for commercial undertakings, such as restaurant, hotel, duty-free shop, department store, recreational center, etc. The deposit money and rental thus collected would be enough to defray a portion of the building cost. Naturally, this lightens the financial burden of the transportation agencies. More important, it helps make the city prosperous. In view of its fine locality and good business prospect, people are willing to invest in such ventures.

A typical example of this kind of transportaion terminal is the People's Station of a Japanese railway in Tokyo. It is a joint venture of Japanese National Railway Administration and private financial syndicates. The magnificent building is now being used by the railway and other commercial firms. The Hawaii International Airport is having a vast expansion, a major portion of which will be used as a commercial complex. It was mainly financied by the private sector. When the new Taipei railway station and the Taoyuan civil airport are to be built, examples of Japan and Hawaii should be followed so as to ease our government's financial burden, promote trade, and develop tourism industry.

Conclusion

The above-stated ten points are all important measures

for the development of transportation economy today. Because these pin-point to the realistic requirements of both the users and suppliers of transportation, they become the targets of all developed countries. At the moment when our economic development has reached a new realm, these measures may well be used as our policy objectives and essential guidelines for future transportation planning. With the glorious success in our economy in the past, we have every reason to believe that a bright future is in our grip.

(December 1971)

CHINESE SAILING VESSELS

By Prof. Wang Kuang

Introduction

The discovery that wood floats on water gave mankind a concept of shipbuilding. Undoubtedly the first action of the primitive people was to utilize floating logs; then the logs were fastened together to make rafts. Later, logs were hollowed by means of fire, knives or chisels to lesson their weight and increase their buoyancy. Then the bow and stern were made round and smooth to increase controlability and to facilitate forward motion. Still afterwards, people understood how to use logs for building boats, utilizing sails, mat-coverings, sculls, bamboo poles, oars to navigate the waters. Up to this stage, sailing vessels became a useful means of water transportation as well as warfare.

The Chinese sailing vessels had a long history equal to that of the Egyptians and Phoenicians and their development improved with the march of time. Their shape and capability varied according to geographical environment and the object of usage and also were different from those of the Western world. But the Chinese art of shipbuilding and navigation was formerly considered superior to other contemporary nations. A study of the historical evolution of Chinese sailing vessels will substantiate this statement.

Ancient Chinese Sailing Vessels

There are many old accounts recording the invention of

sailing vessels in China. Shih Pen (The Origin of the World) said: "The ancient people built boats from their observation of falling leaves." Hwai Nan Tze stated: "The ancients saw hollow wood floating, then understood how to build boats." The section of "Hsi Tsu" or "An Explanation of Prognostics" in the Book of Changes mentioned that hollowing logs for boats and cutting wood for paddle was found in the time of ancient rulers Huang-Ti, Yao and Shun. The book Wu Yuen (The Origin of Things) told us: "The ruler Sui Jen crossed the river by riding on calabashes and the ruler Fu Hsi began riding rafts." Shih Pen again said: "Kung Ku and Ho Ti (two artisans in the reign of Huang-Ti) invented boats." Shan Hai King (The Book about Mountain and Seas) mentioned: "Pan Yü invented the first boat." Shih I Chi (Untold Tales) talked about Hsuan Yuan changing rafts into boats and paddles. The ancient raft was the forerunner of bamboo and log rafts of to-day. All in all, before the boat and paddle were in existence, some clever, imaginative men observed falling leaves and got the concept of buoyancy in their mind, so they tried the idea by floating on calabashes first. Then some others hollowed logs into canoes and still others fastened logs together as rafts. During this long period of evolution, names might be various and inventors were many. But we can imagine this thing had gone through all kinds of modification and improvement in order to reach the boat form. The Wu Yuen again tells us: "The ruler Chuan Hsiu invented the bamboo pole and the oar. The ruler Ti-Ku invented the rudder and the scull. Emperor Yü of Hsia made

a rudder resembling a king crab and added to a boat with covering, stone anchor, sail and mast. Wu Yuan (a famous general in the Spring and Autumn Period) first built 'Tower Vessels' of many decks." The accessory implements for sailing vessels had also passed through succesive stages of improvements.

River Transportation and Marine Warfare in the "Spring and Autumn Period"

In the "Spring and Autumn Period" extending from 770 to 528 B.C., the use of sailing vessels was greatly in fashion. The water route down eastward from the River Wei through the River Huang-Ho northward to the River Fen, a total distance of more than seven hundred li, was the busiest line of river transportation. At that time the Gulf of Chili, Shantung Peninsula and the present provinces of Kiangsu and Chekiang belonged to the states of Yen, Tsi, Wu and Yueh, each having its sea-going activities. When the ruling lords of these states engaged in war against each other, their "boat armadas" took part. About 559 to 549 B.C., the state of Chu attacked the state of Wu with its "Boat Armada." On the account, the present Chinese navy has a history of over 2500 years old. The earliest sea battle was fought in 485 A.D., when the ruling lord Fu Cha of Wu sent his "Boat Armada" from present Kiangsu by sea to attack the state of Tsi in present Shantung. The battleships they used were called the "Great Wings," "Middle Wings" and "Little Wings." The "Great Wing" was 100 chi (Chinese foot) long

and 15 chi and 3 tsun (Chinese inch) wide; the "Middle Wing," 90 chi long, and 13 chi and 5 tsun wide; and the "Little Wing" 56 chi long and 12 chi wide.

The Tower Boats of the Han Dynasty

The First Emperor of the Chin Dynasty unified the country in 221 B.C. His eastern boundary reached the sea and Korea. The Emperor Wu of the Han Dynasty following the steps of the First Emperor of the Chin extended the nation's boundaries further and sent his "Wave Taming General" Lu Po Teh and "Tower Boat General" Yang Pu to southern China (present day Kwantung and Kwangsi provinces). When that territory was taken, the Emperor had nine prefectures established, viz., Tan Erh (the Jar's Ear) Chu Ya (the Pearl Cliff), Nan Hai (South Sea), Tsang Wu (Green Dryandra), Yü Lin (Flourishing Forest), Ho Pu (the Joint River Bank), Chiao Chi (present day Hanoi, Vietnam), Chiu Chen (present day Thank-hoa, Vietnam) and Jih Nan (present day Vinh, Vietnam). He again despatched Yang Pu to conquer Korea and divided the country into Chen Fan, Lin Tun, Lo Lang and Hsüan To—four prefectures. In preparation for these conquests, Emperor Wu trained his navy and built "tower boats" (樓船) in about 150 B.C. The construction of these "tower boats" was described as follows: "Three layers of deck are built on this boat with parapet and battle partitions. Banners are flying on the masts. Arrow windows and spear holes are carved in the bulwarks. The outside is covered with felt and hide to resist fire. The cannon

carriages on the upper deck throw stones and pour down melting iron. This boat looks like a small hill. On the long ones, running carriages and galloping horses can find ample space." Then the Chinese armada ran criss-cross the Gulf of Chili and the Yellow and Eastern seas, rescued Tung An (present day Yung Chia, Chekiang) and went by sea from Kwai Chi (Soochow) defeating the forces of Ming-Yueh (Foochow). The last mentioned victory was accomplished mainly by the naval force under the "Sea Crossing General" Han Yueh. General Yang Pu's conquest of Korea started from Tsi (Shantung) and crossed the Gulf of Chili. Thus the "tower boats" not only became a name for the warships but also a general title for the Chinese navy.

The Warships of the Three Kingdoms

In the time of the Three Kingdoms, Sun Chuan, one of the ruling kings, besides defeating the forces of Tsao Tsao of Wei Kingdom with his Yangtze River squadron, had ambitious plans on the sea. After suppressing the uprising in Chau Chow (present day Vietnam) he proceeded to subdue Malay Peninsula and other lands. So Kang Tai and Chu Ying were sent as envoys to the South Seas. They travelled and heard about one hundred and several tens of states. Their trip started from Chau Chow and went to Lin Yi (Kwangnam, Vietnam), Fu-Nan (Cambodia), Malay Peninsula, Java, and Burma (Thailand). The warships at that time, in comparison with those in the Han Dynasty, found something new in the old. They were classified into "Mung Ch'ung" (long and swift warships), "battleship," "running

barge" (the above three kinds were warships), "dragon boat" (to be ridden by the king), "oil boat" (used for nightly secret crossing) and "Changan." A description of the appearance and equipment of the warships was found as follows:

(a) *The "Mung Ch'ung" ship* (蒙衝)

"Its top was covered with raw cow-hide with oar holes carved through both bulwarks so that it could not be damaged by arrows or stones. Arrow windows and spear holes were provided at all sides to be used for speedy, surprise attack on the enemy force when they came to its vicinity." It was still used in the Tang Dynasty.

(b) *The "battleship"* (鬪艦)

"On the bulwarks, parapets capable of covering the lower half of a man's body are built with oar holes under them. Backing inside five chi, a palisade was erected as high as the parapets with a second layer of parapets on it also to be manned by fighters. This kind of ship had no top. Banners, gongs and drums are provided at all sides." The Tang Dynasty used such type of ship for their conquest of Korea.

(c) *The "running barge"* (走舸)

"Parapets were built on the bulwarks. It was manned by many oarmen and the fighters were chosen for their bravery, strength and cleverness. This was also used for speedy, surprise attacks, and its movement was quick like sea-gulls. It was also equipped with banners, gongs and drums." This type of boat found its use in the Tang Dynasty.

The Majestic Naval Power of the Sui and Tang Dynasties

The Emperor Wen of the Sui Dynasty conquered

the State of Chen in 581 A.D. and unified the country. The success was mainly due to their superior naval force. Before the conquest he had many warships built bearing the name of Wu Ya (五牙) and Huang Lung (黃龍 Yellow Dragon). The Wu Ya had five decks with a height of more than 100 chi. The "Lu Pei" (cannon) poles of fifty chi high each were hoisted at all sides. It had a crew of 800 fighters. The Huang Lung, smaller than the Wu Ya, could hold 100 fighters. Still smaller ones were called "Ping Chen" (平乘) and "Cha Mung." (舸艋)

Emperor Yang, son of Emperor Wen, made a great contribution to the construction of the Chinese canal system. During his reign, many canals were dredged; namely, Kuang Tsi Chu, Yung Tsi Chu, Tung Tsi Chu, Kan Kou and Kiangnan Canal. This canal system ran through the Rivers Huang-Ho, Pei-Ho, Yangtze Kiang and Hwai-Ho to complete the water transportation network which exerted a great influence on the unification and economic development of China in later generations. Besides, there was important extension of sea transportation at that time. Forces were sent to Lin Yi (Vietnam) to do his conquest. Courtiers Shan Tsun Tsun and Wang Chun-Tsun undertook his mission from Lin Yi and Malay Peninsula westward to the "Red Land" (probably Sumatra) and Chen Leng and Chang Chen were commanded to land on Formosa (probably at present day Lu Kong).

The overseas conquests of the Tang Dynasty transcended those of the previous reigns. Up-to-date, the name of "Tang people" is still existent as the representative title of our

overseas Chinese. When the Emperor Kao Tsung sent his troops to the Korean Peninsula, the expedition started from Chen Shan, on Shantung Peninsula and in one battle Pei-Tsi was taken. In his third year of Lung So (663 A. D.), the naval forces under General Liu Jen-kuei defeated the Japanese navy at the mouth of Pei-Kiang River (present day Ching-Kiang River), in four successive encounters, and burnt their 400 ships. This feat wrote a glorious page in the history of Chinese naval wars. The ships used at that time were the "battleships", "running barges," "Sea Hawks," "Mung Ch'ung," "barges", etc. Each kind performed its duty efficiently and large and small ones rendered mutual cooperation in unison, thus they defeated the enemy and won a complete victory. "The 'Sea Hawk' had a wide and low bow and a narrow and high stern, just like a hawk. On both bulwarks movable planks in the shape of a hawk's wing were placed for stabilizing its rolling motion in gusts of wind and billows of raging sea. On the upper part of the ship, raw cow-hide battlements protected both sides. Banners, gongs and drums were provided as usual."

Later, Chinese and Japanese envoys shuttled to and fro and Japanese students and Buddhist monks often came to China. The merchant vessels were mostly owned by the Tang people. These vessels generally measured 150 chi long and 10 chi or more wide. Each could hold sixty people, the large ones, 120 people.

In the Tang Dynasty, bilateral foreign trade was very prosperous, mainly at the trading centers, Canton and

Yangchow. Ships coming from Ta-Shi (Arabia) ranked first in number, then Hindu and Persian vessels came next. Commodities plied up as high as mountains. In order to administer the trade, customs duties, foreign merchants, tribute bearing missions and to inspect commodities on the incoming and outgoing vessels, a Trading ship Administration was established in Canton performing the duties of Port Administration and Inspectorate of Customs of present day. In that period, Chinese vessels sailing back and forth in the South Seas and Indian Ocean. According to Arabian historical records, in the fifth century, the Persian Gulf and Hira on the bank of Euphrates had visits from Chinese ships. The incoming and outgoing vessels had to be inspected by the government Administrator. The Arabian ships came to China in spring or summer and left in autumn or winter. Chinese shipping operated just the opposite way; they left ports about the fourth or fifth moon and came back about the tenth to twelfth moon of the lunar calendar year. A prevalent adage saying: "Sailing by the north wind and coming back by the south wind" proved that the Chinese seafarers had already known how to utilize the trade wind.

The Wheel Ships of the Sung Dynasty

In fact the Chinese can claim to be the inventor of running vessels by wheels. In the Sung Dynasty, there were already "wheel barges," (車輪舸) a kind of warship. According to a description of that time: 'wheel barge,' 42 chi long, 13 chi wide, with projection hollow frame of one chi wide

outside of the bulwarks under which were four wheels of about one chi draft, is run by man-power with great speed as if flying. The length of the flat bow is eight chi, that of the middle hold, twenty seven chi and that of the stern, seven chi with a rudder house on it. On the top of the hold, from the bow to the stern, a large wooden beam is laid, with covering planks of five chi long and two chi wide on both side of the beam. Axes for the wheels were hung under the beam by a sort of 'suspension windows.' In meeting with an enemy, cannon balls, arrows and fire are shot out from the vessel unforeseen by the attacking party. When the enemy force becomes a little weak, fighters in the barge rise from the hold by raising the covering planks and stand behind the bulwarks, which together with the hold are covered with raw cow-hide. Simultaneously, throwing of fire balls, hurling of pointed spears and use of hooks will decidedly destroy enemy ships. This was the method of building and equipping the "wheel barges" which somewhat resembled the open-shaft steamships of the West, except that these Chinese ships were operated by man-power instead of steam. In the Battle of Tsai Shih, when Yu Yun-Wen's troops defeated the King forces, this type of vessels was fully utilized. It was said: "Men inside the boat pedalling their heels make the vessel go forward as if flying and nobody can be detected from outside."

The Merchant Vessels in the Sung and Yuan Period

Although foreign trade was prosperous in the Tang Dynasty, yet foreign ships were more than Chinese in number.

Down to the period of the Sung and Yuan the situation reversed. Foreigners coming to China were mostly aboard Chinese vessels. This condition began in the first years of the Northern Sung and remained even more so down to the Southern Sung and Yuan Dynasties. The government then promulgated a "Trading Ship Law." By that, the Chinese ships seized a lion's share in the sea transportation to and from India and the South Seas, because, though Arabia was in the leading position in overseas shipping then, the Arabian ships were smaller in size, while the Chinese ships had the capacity of holding 500 to 1000 people and were safe and seaworthy. These Chinese ships were classified into three categories: the biggest ones called junks or "jong," (艟) next "zao" (艚) or boat and still next Kakam (cargo boat), all made in Canton from pine logs in 2, 3 or 4 layers. The large ship had four decks with fifty to sixty passenger cabins. In the technique of shipbuilding, the bulkhead was invented. The compass invented by our ancestors (It was transmitted to Europe through the Arabians). made a great contribution in safety to sea navigation. The water-resisting bulkhead left to the present was an important invention adopted by the shipbuilding trade in every nation.

The shipping organization at that time was very compact. Every-seagoing ship had a "Kong Shon" or captain and two vice "Kong Shon" or boatswains who were entrusted with the duty of controlling and inspecting passengers aboard. The disobedient ones could be punished by flogging. A licence recording the name of the captain, number of passengers,

and the size and shape of the ship was issued to each ship. There were other seamen on the boat such as scull pullers, stevedores, etc. Each ship was equipped with weapons to guard against pirates. The military service men on the ship were archers, shield-bearer and others.

Each boat had 4, 5 or 6 to 12 masts. When there was wind, sails were hoisted. In time of still weather sculls were used. A boat had 8 or 10 to 20 sculls and each scull pulled by 4, 10, or 15 to 30 men. A number of skiffs were provided for provision purchasing, water carrying and life saving.

The Grain Transport Boats of the Yuan and Ming Dynasties

The capital of the Yuan and Ming Dynasties was in Peiping. North China had not enough grain so it had to be transported from provinces south of the Yangtze River. On account of the high cost of transportation by rivers and land routes, the regulation of transporting grain to the north by sea was originated in the Yuan Dynasty. The emperor Shih Tsung, early in his 19th year of Chi Chen (1228 A.D.), commanded the administrators in Shanghai, Lo Pi, Chang Hsuan and Chu Ting to build sixty flat bottom sea vessels to transport 46,000 piculs of grain from Liu Chia Kong, Soochow and Huang Lien Sha, Haiman. These transports reached Tientsin safely in the third moon of next year and this initial sailing was found satisfactory. Then it was ordered to transport to North China no less than three million piculs

of grain from the south. This grain transporting set-up composed of 900 boats and 8000 boatmen families. They were organized into 30-vessel groups known as "Kongs" each supervised by two "Grain Custodians." The boatmen summoned were concentrated in Yangchow for a training in sea navigation. The administration of nation's far and wide realm and the conquest of inland states and sea nations in that dynasty relied on this transportation system for food supply. Boatmen experienced in sea-going life supplied a recruiting source for naval service men. These sea transports were called "ocean covering boats" (遮洋船) (of 88 chi length) and "wind drilling boats." (鑽風船)

The Ming Dynasty grain boats copied the "ocean covering" type of the Yuan, with flat bottom and shallow hold. The measurements of this kind of ship were as follows: bottom length, 52 chi, thickness of the covering planks, 2 tsun made of cedar and chestnut; bottom forward length, 9 chi and 5 tsun; stern length, 9 chi and 5 tsun; bottom width 9 chi and 5 tsun; bottom forward width 6 chi; bottom rear width 5 chi. A boat could carry 2,000 piculs of rice. Later when this type of vessel was built for military transports the length of the bottom was increased by 20 chi and width of the bow and stern by 2 chi or more and its capacity was increased to 3,000 piculs.

The Seven Distant Voyages of Cheng Ho

When Emperor Chen Tsu ascended the Ming throne

after a coup d'etat, the nation's treasury was drained near to emptiness, and subsequent wars against Mongolia spent a good part of the national income, so the Emperor expected to replenish his coffer by profits from foreign trade. In his first year of Yung Lo (1403 A.D.) he reinstituted the three Trading Ship Administrations in Kwantung, Fukien and Chekiang which had ceased functioning for a period, and also prepared vessels to sea for seeking profit from mutual trade. Then he sent his trusted ennuch Cheng Ho abroad as his envoy. The first trip was started from Liu Chia Kong, Soochow with 62 ships and about 27,800 men. This party went to Champa, Java, passing through Palambang, Aru, Sumatra, Ceylon, Kulam Quilon, finally arrived at Calcutta, India and returned to Nanking in the twelfth moon, 1407.

After that maiden trip, Cheng Ho led such similar mission six times more. Altogether seven voyages were made from 1405 to 1433, averaging four years a trip. His party reached and called on 35 states. The itinerancy covered the Persian Gulf, cities along the coast of Arabian Sea such as Hormuz, Djofar, Aden and Mecca and those on the Eastern African coast such as Molinde, Mogeduxu, Brawa and Juba. The long distance covered the size of the party and the dexterity in sea navigation had not yet been found in Chinese history.

The big ships used by the party were 444 chi long and 18 chi wide; smaller ones, 370 chi long and 15 chi wide: average capacity 440 men per ship. The skillfulness of the ship-wright could be seen from such figures. Cheng Ho's

missions to foreign land caused "successive tribute bearing missions from foreign states to bring in strange commodities and valuable treasure which had never been seen in former dynasties. Such tributes enriched the national coffer and increased the national hoard after ample expenses." It was again told that the missions brought back "numerous invaluable treasures." People in foreign lands were also benefitted by Chinese commodities, so bilateral commerce was promoted with trading ships shuttling back and forth continuously. This was the reason why the ships led by Cheng Ho were called "Treasure Ships" and his title was the "Envoy of Trade and Treasure," equivalent to the present day commercial commissioner. Cheng Ho discharged his duty faithfully and successfully. To commemorate this great navigator, we celebrate July 11th of each year, the starting date of his first voyage, as our Sea Navigation Day.

The Warships of the Ming Dynasty

In the middle of the Ming Dynasty, Japanese pirates often created disturbances along Chinese coast. To guard against their surprise attack warships of different types and sizes were built. The most important ones were as follows:

(a) *The Fukien Ship* (福船)

This type of ship was mostly built in Fukien province. It was high and as large as a storied building, with a draft of 11 and 12 chi and a capacity of 100 men. The keel was pointed and the deck was wide. Its bow raised high with widely bow opening, and its stern was lofty with three decks

of cabins on it. The sides of these cabins were protected by guarding planks covered with reeds and bamboos to make it as firm as a wall. Two masts were for hanging sails. The middle section consisted of four decks. The lowest hold, uninhabitable, was filled with earth and stones as ballast. The second deck was used as living quarters of the fighters. On both side of the third deck, wooden anchors tied with palm ropes were placed, and from this deck these anchors were weighed and anchored. The uppermost deck resembled an open terrace with wing-shape planks at both sides as a balustrade for fighters reclining to attack enemies. This ship was somewhat similar to the modern battleship. General Tsi Chi-Kuang of that period said: "The Fukien ships are lofty and big as a city, cannot be navigated by manpower, and are wholly dependent on the wind. The Japanese boats are originally small. When the Fukien ships riding the wind rush onto the latter, it seems as carriages running over mantes so the fight is between vessels, not between manpower, and we usually win."

(b) *The "Kwangtung" Ship* (廣船)

This type of ship was mostly built in Kwangtung province. Its size was larger than the former type and it was built of teak instead of pine and fir as the Fukien ships, so it is even more hardy. The Japanese ships dared not rush against them. But the shape of this type was of narrow keel and wide deck as if having two wings which made them only useful along the coast. In open sea these ships were bound to roll and their shooting would easily miss the targets.

Moreover, since their tops was lids of bamboo, a contact with fire would be highly inflammable. This defect made them not so landable as the Fukien ships which had a palisade against attack.

(c) *The "Tsao-Pi" Boat* (草撇船)

This type of boat, also called scouting boat, was the Fukien ship in smaller size and was used for patrolling.

(d) *The "Hai-Tsang" Boat* (海滄船)

This, also named "winter" boat, was smaller than the Fukien ship with a draft of 7 or 8 chi. When the wind is weak, it could be run by man-power. It was useful for patrolling and pursuing.

(e) *The "Kai-Long" Boat* (開浪船)

Its other name is "bird boat" because of its pointed bow. With a draft of 3 or 4 chi, four oars and one scull it, moved in a flying manner. Its capacity was 30 to 50 people. It was useful for scouting and pursuing under any wind and tide condition.

(f) *The "Ba-La-Hsiao" Boat* (叭喇唬船)

This type of boat, used mostly in Chekiang province, was of pointed bottom and wide deck. The width of the bow and stern was similar. On the bottom, a keel of 40 chi long and about 10 chi wide ran from the bow to stern. A piece of long plank was put on each side of the upper deck for boatmen sitting backward to pull the oars. When the oars were in motion, the speed of the boat was tremendous, like flying. Sails were raised when wind was blowing. If the oars were slanting backwards they served as an inclined rudder.

This kind of boat could break waves and was convenient for pursuing and scouting.

(g) *The "Tsang Shan" Boat* (蒼山船)

The bow and stern of this boat were broad. It was equipped with sails and sculls, sails for good wind and sculls for still weather. The sculls were placed in the rear half of the bulwarks, five on each side. Its decks were separated by planks. The lowest hold was ballasted with sand and stones. The upper deck was reserved for war operation, and lower deck was for living quarters. Two decks were connected by ladders through trap doors. It was convenient and speedy to rush against enemy boats.

(h) *The "Sand" Boat* (沙船)

The sand boats were of flat bottom and could not break big waves in deep waters. So they were only fit for guarding the ports and patrolling in shallow places. They were often used along the coast of Kiangsu province.

Concluding Observations

The rulers of the Tsing Dynasty coming from Manchuria could not understand the overseas conditions and recognized the importance of sea power. Moreover, their hate of Koxinga in Formosa prompted them to issue orders forbidding any vessel going to sea. After the liquidation of Koxinga's state; his remaining followers scattered to other countries. The reigning dynasty took for granted all Chinese in the South Seas were "remanent evil characters of Koxinga" and places such as Java were "pirates' hideout." In the 55th year of

Kanghsi (1717 A.D.) an imperial edit regulated: "Vessels are forbidden to go trading in places such as the South Seas, Luzon and Java, and trespassers are to be duly punished." The government then never sent any vessels abroad. From that time on, Chinese sailing vessels navigated in the rivers and along the coast only. Though this embargo on sea voyages was lifted later, shipbuilding in China lagged behind the other countries. Thus China's sea transportation declined and her right of navigation was left to the hands of others. Then and not until we won back the right of navigation after the World War II, did we began anew to build up our shipping industry and now are entering a new era of sea transportation.

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PART V

An Introduction to Professor Wang Kuang's Books on Transportation Science

AN INTRODUCTION TO PROFESSOR WANG KUANG'S BOOKS ON TRANSPORTATION SCIENCE

1. A Study of Communications and Transportation According to Dr. Sun Yat-sen's Plan of Industrialization for China (Volume I) 實業計劃交通論

Date of Publication: March, 1955.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$25.00 for a volume of 269 pages.

As early as by the end of the First World War, Dr. Sun Yat-sen, Father of the Republic of China, published his works "The Plan of Industrialization for China." This book has been highly valued by the whole world as its essentials are still accounted by specialists as the principles for reconstruction of China. In it, the plan of communications and transportation is of paramount importance, just as Dr. Sun declared in his preface: "Among all the problems in my plan, I lay special stress on the importance of transportation, such as, construction of railways and highways, excavation of canals and waterways, and building of towns and harbours, since it is vital to the development of all industries regardless of what natural resources may lie underground."

However, it has been more than 40 years since Dr. Sun's plan was published. There have been many alterations of the environment in China, in comparison with that of Dr. Sun's days, and we have enough reasons to make a check

of this plan. In old days, foreign powers had great influence on the reconstruction of China. For example, they had special privileges in making profit in the settlement area or concession harbour and in building railways upon the soil of China. All such things considered by Dr. Sun and patriotic Chinese as intolerable, were incorporated in his primary plan with an aim to reproving all such special privileges for foreigners. But now, as all the treaties of inequality have been abolished and obstacles on the way of reconstruction swept off, planners can have more freedom in their designing. Besides the foreign influences, the existing railways, highways, harbour installations, power plants, etc, which were built up to meet the needs during those years after Dr. Sun's plan, must be used to the best advantage. The development of hydraulic power, such as T.V.A. in America, offers a vivid but new example of industrialization. All these things fabricate controlling points in the betterment of planning.

The author being familiar with every aspect of the problem and well versed with the findings of renowned specialists, offers valuable advices in coping with the present situation in China today. The discussion covers every topic about the problems of how to build up well coordinated systems of communications and transportation, such as, the site of harbours, the location of building railways and highways, the improvement of waterways, the establishment of shipbuilding dockyards and the network of radio and telephone communications. His chief opinion includes the

following:

(1) the site of the Great Eastern Harbour and of the Great Northern Harbour,

(2) the railway System, and

(3) the inland waterway, all with detailed descriptions.

This book consisting of twenty chapters may be regarded as a general introduction to the execution of Dr. Sun's plan. It comprises authoritative records and well-drawn pictures which can hardly be found from bookstores. Although it is too abridged when applied to engineering field, it can nevertheless serve as a good reference for the study of economic reconstruction of China.

2. A Study of Communications and Transportation according to Dr. Sun Yat-sen's Plan of Industrialization for China (Volume II) 實業計劃交通論第二集

Date of Publication: August, 1960.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$25.00 for a volume of 124 pages.

This book is composed of ten chapters, bearing the author's farsighted opinions and plans of practicality based on his comprehensive study of the important projects regarding communications and transportation in Dr. Sun Yat-sen's Plan of Industrialization for China. It is a well of knowledge and also a distinguished literature as a supplement to Dr. Sun Yat-sen's first book on the said subject.

3. Modern Transportation 近代運輸學

Date of Publication: September 1972. (Revised 5th Edition)
Publisher: Maritime Publishing Company, Taipei, Taiwan, China.
Price: NT$100.00 for a volume of 500 pages.

This book is composed of 24 chapters. Its general description includes (1) the formation of modern transportation, (2) the development of transportation business, (3) the management of transportation enterprises, (4) a comparison of economy on various phases (or means) of transportation, (5) the consignment and transportation of freight (6) the trading terms in transportation business, and (7) containerization. It also deals with railways, highways, waterways, aviation, etc., with regard to the various factors of transportation, such as, the routes, the equipment, the power, and communication facilities.

The reference materials for the book were collected from domestic and foreign sources, together with illustrations.

This book has become very popular among the colleges and universities in Taiwan and has been adopted as a textbook for transportation courses since its first edition published in 1960.

4. The Policy of Communications 交通政策

Date of Publication: July, 1954.
Publisher: Maritime Publishing Company, Taipei, Taiwan, China.
Price: NT$18.00 for a volume of 208 pages.

This book covers discussions concerning railways, highways, waterways, ports, civil aviation, posts and telecommunications, etc. Its description consists of historical events, theoretical discussions, and studies on the measures for reconstruction with concise and fair criticism. Its appendix, listing the biggest events of communications, may be used as a modern history of communications by the people who are interested in transportation business.

5. How to Develop Intra and Inter Communications Among Provinces and Hsiens 省縣交通

Date of Publication: October, 1953.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$15.00 for a volume of 86 pages.

This book is composed of looseleaf lessons of a correspondence course offered by the author at China District Autonomy school. Its contents comprise the district autonomy and the general conditon of communications on Mainland China, as well as Taiwan's communications and engineering conditions. All the lessons are given in five chapters, with exercises attached at the end of each chapter. It is very helpful to students for self-tutoring.

6. Communications in China 中國交通概論

Date of Publication: October, 1953.

Publisher: Cheng Chung Publishing Company, Taipei, Taiwan, China.

Price: NT$32.00 for a volume of 234 pages.

This book tells of the background and development of the Chinese Railways, Highways, Aviation, Posts and Telecommunications in a concise and systematic way.

The collection of information covers both Mainland China and Taiwan. This book, attached with various charts, maps, and illustration of the national railways, aviation routes, and other phases of transportation, can serve as a good reference book.

7. About the Communication, Past and Present 交通古今談

Date of Publication: December, 1956.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$24.00 for a volume of 241 pages.

This book is composed of forty-five articles covering the historical background of communications, the invention and progress of transportation tools, and the constuctive criticisms on the administration system of communications with strange and lasting recommendations for the past and persent.

It may serve to the readers as a modern history of communications and a book of policy-making on transportation and communications. Being equipped with sixty illustrations of historical and modernized transportation tools of new designs, it is also a book good for pleasure reading.

8. Taiwan's Communications of Today (published in both Chinese and English) 臺灣之交通

Date of Publication: December, 1957.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$10.00 for a volume of 79 pages.

This book describes the development up to the present state of Taiwan's communications in the various fields of Railways, Highways, Ports, Ocean transportation, Posts, and Telecommunications and Aviations, with reliable records.

A comparison of the various statistical figures from the period of Japanese occupation up to the present is in itself sufficient to show the remarkable progress it has accomplished. Its full text has been translated into English, so that it will be easier to understand those special terms in both English and Chinese.

9. Economics of Shipping 航業經濟學

Date of Publication: September, 1972. (Revised 3rd Edition)

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$80.00 for a volume of 362 pages.

This book consists of twenty five chapters, namely: (1) Different Categories of the Shipping Industry, (2) Freight Traffic, (3) Passenger Traffic, (4) Economical Point of View on Vessels, (5) Economical Point of View on Ship's Machineries, (6) Trade and Shipping, (7) Documentation and Certificates of Vessels, (8) Port Dues and Port Charges, (9) World Freight Markets, (10) Cost of Shipping Operations, (11) Freight Conferences, (12) Charter-parties, (13) Marine Insurance, (14) General Average, (15) Postwar World

Shipping Condition, (16) Postwar World Shipbuilding Industry, (17) Postwar Shipping Policies of Various Nations, (18) Suggestions for the Development of Chinese Shipping, and (19) Problems of Modernization of shipping Industry.

10. Ocean Transportation 海運學

Date of Publication: August, 1969. (Revised 5th Edition)
Publisher: Maritime Publishing Company, Taipei, Taiwan, China.
Price: NT$100.00 for a volume of 624 pages.

This book consists of thirty-one chapters, covering structures of the merchant ship, organization of the shipping business, the port facilities, and the shipping operation and shipping policies, etc., with 166 pictures of new types of the merchant ship with modern machinary. Its contents are rich and practical for application.

It may be regarded as everybody's book for the shipping people and international traders as well as the best college textbook for students of maritime courses.

Its first edition was published in 1951, and since then, it has been revised four times. This is the fifth edition.

11. Navigation and National Defence 海運與國防

Date of Publication: June, 1957.
Publisher: Maritime Publishing Company, Taipei, Taiwan, China.
Price: NT$30.00 for a volume of 214 pages.

This book was published first in early 1953, and was revised in its second edition about four years later when there were many technical and operational improvements made on

the merchant and naval vessels. The major points of revisions made by the author in this book are as follows: (1) Freight computation for the employment of merchant vessels by the Ministry of National Defence, (2) Standardization of merchant ships, (3) Modernization of naval ships, (4) Nuclear powered submarines and battleships, (5) Super-class battle ships, (6) The educational systems of navigation, (7) The wartime American shipping, (8) American ocean transportation service in wartime, (9) The wartime management of troop transport, and (10) Oil tankers. Altogether there are ten articles in this book attached with 80 illustrations of modern merchant and naval ships.

12. Seamen's Duties 海員職務

Date of Publication: August, 1951.

Publisher: Maritime Publishing Company, Taipei Taiwan, China.

Price: NT$10.00 for a volume of 78 pages.

This book deals with the rules for seamen in performing their routine duties on board the ship concerning the machinery, the telecommunications, etc.

13. Duties of Seamen to the Management 船員職務與船舶管理

Date of Publication: May, 1965.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$40.00 for a volume of 104 pages.

This book consists of five chapters dealing with the

general description of seamen's duties, and their duties to the management on navigation, machinery, general affairs, and telecommunication. It may be used as a standard book of duties for the seamen and as a reference book for the management.

14. How to Develop Ocean Transportation 發展海運之路

Date of Publication: 1963.

Publisher: The Research Institute on Communications, Ministry of Communications, Taipei, Taiwan, China.

Price: For free distribution. A volume of 20 pages.

This book contains discussions on how to re-enforce the existing shipping routes with Chinese merchant fleet, how to inaugurate new routes to expand Chinese foreign trade, and how to promote the national economy through shipping.

It is a book of practical value with many research reports.

15. History of Shipping in China 中國航業史

Date of Publication: August, 1971. (Revised 2nd Edition)

Publisher: Maritime Publishing Company. Taipei, Taiwan, China.

Price: NT$60.00 for a volume of 308 pages.

The contents of this book are divided into 18 parts, including: (1) General introduction, (2) History of the sea borne trade and shipping business, (3) Development of modern shipping, (4) Development of foreign investment on Chinese shipping industry, (5) The outline of history of China Merchants Steam Navigation Company; and history of

other important navigation companies.

16. The Historical Development of China's Water Transportation 中國水運志

Date of Publication: November 1966.
Publisher: The Maritime Publishing Co., Taipei, Taiwan, China.
Price: NT$90.00 for a volume of 558 pages.

This book is considered by the shipping world as one of the most authoritative documentary books on water transportation in China.

It comprises eight parts, namely,

(1) about the early navigation and sea route trade of ancient China in time of Warring Kingdoms (2300–1900 B. C.).

(2) about the historical development of China's water transportation from the first employment of steam navigation up to the end of 1965.

(3) about an account of foreigners' operation of steamship business in China for almost a hundred years ever since disgraceful conclusion of the opium war in 1895 when China was forced to open her 5 ports to foreign trade up to the outbreak of the 2nd World War in the Pacific area.

(4) about an account of the development of the operation of China Merchants Steam Navigation Company for the last 93 years.

(5) about an account of the system and organization of China's maritime administration ever since the employment of steam navigation.

(6) about maintaining and coordinating the private steamship industry with the military establishments under the supervision of the Chinese maritime administration during on antiaggression war against Japan.

(7) about recovery and expansion of the steamship industry after the successful conclusion of our anti-aggression war against Japan.

(8) about a geographical account of the inland and coastal routes along with the vessels plying over such routes.

The auther of this book, Prof. Wang Kuang, an authority on marititme affairs, has been in service on water transportation for 40 years, personally undergoing through the historical development of the maritime administration in connection with its maritime policies as well as the rules and regulations of Chinese shipping. As the contents of this book are all based on anthentic and documentary materials, it is considered one of the best, maybe the best book in the history of water transportation in China. It is composed of 558 pages in addition to an appendix of 96 pages of tables showing the distances of the various routes and 60 pictures showing the historical facts of water transportation in China. It is indeed a book of interesting information for all shipping people.

17. Water Transportation 水道運輸學

Date of Publication: August, 1956.

Publisher: The Commercial Press, Ltd., Taipei, Taiwan, China.

Price: NT$36.00 for a volume of 298 pages.

This book was published in August, 1945 on Mainland China, and since then it has been revised by the author in Taiwan. Besides the inland waterway transportation, it has a supplemental article on ocean transportation, such as, management of the merchant ships, operation of the shipping business, the general condition of the shipping routes, and supervision of the port and the enforcement of the shipping policy.

18. Shipping—The Nation's Life Line 航運——國家的生命線

Date of Publication: August, 1962.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$30.00 for a volume of 274 pages.

This book consists of nineteen articles about (1) The important records of the Chinese shipping business during the past fifty years, (2) Shipping—The Nation's Life Line, (3) The shipping policy in relation to the system of operation, (4) Free ports and Free trade districts, and (5) Taiwan Navigation Company and the Chinese shipping industry. Its appendices include seven articles on the shipping policy written during 1926–1928, which show the author's ideas in early year and serve as a guide to his service in the shipping business later on.

19. Water Transportation During Sino-Japanese War 抗戰時期水運紀要

Date of Publication: May, 1965.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$20.00 for a volume of 102 pages.

During the period of Sino-Japanese War, the Chinese shipping administrators and shipping people had to devote themselves to face the uncertain situation with very weak maritime tools in their hands. However, with their best ability they managed not only to meet the military requirements but also to maintain the civil transportation for the general public. All of their achievements are worthy to be remembered. As the author participated in those events from the beginning to the end, he remembers all the details clearly as shown in his annual reports. This book serves to give a part of the history of the Sino-Japanese War and is therefore a good book for scholars to use for the study of the modern history of communications and transportation in China.

20. Water Transportation During Sino-Japanese War (English Edition) 抗戰時期水運紀要英文本

Date of Publication: November 1966.

Publisher: China Maritime Institute, Taipei, Taiwan, China.

Price: NT$30.00 for a volume of 114 pages.

21. The Blockade Lines of the Yangtze River 長江封鎖線

Date of Publication: Nevember, 1957.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$15.00 for a volume of 146 pages.

This book comprises forty articles in four parts. The first part covers a general discussion on the problems concerning water transportation with concrete propositions on the key problems. The second part is a record of some heroic events showing the loyalty of the public servants in the Blockade of the Yangtze River by scuttling our own vessels. The third part is an introduction and review of books of communications with critical remarks and book references. And the fourth part is an account of some unforgettable people with their social activities of strange and lasting interests.

22. The Ports of China 中國海港誌

Date of Publication: March, 1954.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$36.00 for a volume of 215 pages.

Its contents include 82 important sea ports and river ports, the coastal lines of Northeast China, North China, East China, South China, and the islands of Hainan, and Choushan with detailed maps from actual survey. It is a rare one in the bookshops now.

23. The Harbors of China 中國港口論

Date of Publication: April, 1952.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$50.00 for a volume of 377 pages.

This book describes the natural environment and port facilities of thirty ports including Shanghai, Tsingtao, Dairen, Canton, Ningpo, and Hankow. It also gives a general picture of trading and engineering plans in detail with 130 illustrations of the port facilities in China and other countries.

24. Introduction to Harbors in China 中國海港紀要

Date of Publication: August, 1971, (Revised 2nd Edition)

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$40.00 for a volume of 174 pages.

This book is a supplement to the author's two previous books under the title of "THE HARBORS OF CHINA" and "THE PORTS OF CHINA". Its contents are fresh with enriched illustrations, including harbors in the mainland and on Taiwan. It is a book good for the students of geography and port employees to use as a reference book.

25. The Ports of the World 世界海港誌

Date of Publication: October, 1953.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$50.00 for a volume of 340 pages.

This book gives a description of the 100 famous ports of the world, regarding each one of their past history, geographical environment, port facilities, port charges, and other trading information. For some of them it also discusses some new plans for harbor construction.

It contains 132 pictures of port facilities and other establishments and may serve as a reference book for students of navigation and port engineering.

26. Introduction to the Study of Ports 海港概論

Date of Publication: september 1972. (3rd Edition)

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$40.00 for a volume of 150 pages.

This describes about port engineering, navigation aid engineering, and systems of port administration, cargo handling facilities at the wharfs and in the godowns, etc. With its 107 pictures of port engineering and port facilities, it may be used as a textbook for college students of engineering courses and as a reference book for the executives of maritime administration.

27. Policy for Ocean Shipping 海運政策

Date of Publication: February, 1954.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price, NT$15.00 for a volume of 162 pages.

This is a book to introduce policies of the outstanding maritime countries, such as, U.S.A., U. K., Japan, Norway, Sweden, Netherlands, Spain, Portugal, Latin America, and other newly established postwar countries. Its contents deal especially in detail with both the protection policies of the various nations and their enforcement in peace-time and war-time.

As its reference materials are all authentic and reliable, it is a book good for those who are interested in political and economical development as well as in military improvement for national defence.

It concludes with a general review and an outlook on ocean shipping. All of its criticisms are based upon the current problems and are therefore worthwhile to be studied by officials and civilians of the shipping world.

28. A Study of the Maritime Administration (Part I) 航政概論

Date of Publication: July, 1952.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$40.00 for a volume of 308 pages.

This book was published after the author's two inspection tours abroad. It describes the systems and practices of the shipping business, seamen, ports, and other maritime affairs.

It also deals with the past and present shipping policies as well as with concrete measures for reformation.

29. A Study of the Maritime Administration (Part II) (航政概論續編)

Date of Publication: December, 1965.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$40.00 for a volume of 234 pages.

This book, written by the author during the last five years, contains thirteen articles on maritime administration.

They are: (1) A study of the system of marine court, (2) Policy of subsidizing shipbuilding with suggestion, (3) Adoption of shipping policies by the major nations after World War II, (4) The shipping industry of Free China during the last ten years, (5) The rising shipping industry in Free China, (6) Problems confronting Keelung Harbour and (7) The problem of constructing an additional inlet for the Kaohsung Harbour.

30. A Study of Ports and Navigation 航港新論

Date of Publication: May, 1958.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$18.00 for a volume of 146 pages.

Ports are usually the homes for merchant vessels and activity bases for the shipping business in peacetime. Their relationship with each other is so close that without a good coordination the roles of transportation between two continents can never be carried out successfully. In wartime, merchant vessels play a very important role in transporting troops and logistic supplies whereas the ports are busily used as reenforcement centers. They are just like two supporting arms for the national defence. The author has valuable opinions discussed in this book.

31. Laws and Regulations of the Maritime Administration 航政法規要義

Date of Publication: March, 1965.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$ 60.00 for a volume of 374 pages.

This book is an explanation of the laws and regulations of the maritime administration during the last thirty-five years. Besides the general description, it covers topics on maritime laws, vessels, crews, and the maritime administration.

As the laws and regulations change from time to time due to difference in respective circumstances, amendments and supplemente have been made and added to the book to enhance its value.

It comprises forty-six chapters in seven parts, dealing with the laws and regulations of the maritime administration. So it is considered as an all time book for research study.

32. The Maritime Law 海商法釋論

Date of Publication: July, 1972. (Revised 2nd Edition)
Publisher: Maritime Publishing Company, Taipei, Taiwan, China.
Price: NT$ 70.00 for a volume of 328 pages.

This is a book of explanation of the Chinese Maritime Law with amendments made on 25th July, 1962.

It gives a clear explanation of the clause of ship, shipmaster, mariner, contract of carriage, collision of ships, assistance and salvage, general average, marine insurance. It also includes many international conventions and apdpendixes on the Bills of Lading and Memorandum of Agreement for Sales and Purchase of Ships in both Chinese and English. An English Translation of The Maritime Law was also added.

33. Law of Ships 船舶法釋論

Date of Publication: February, 1967. (Revised 2nd Edition)
Publisher: Maritime Publishing Company, Taipei, Taiwan, China.
Price: NT$ 60.00 for a volume of 409 pages.

This book explains item by item all the clauses governing ship's operation and seaworthiness as promulgated on January 30th, 1961.

It also gives a description of the laws and practices of various countries including the International Conventions on Safety of Life at Sea.

It may by regarded as a book of comparative study on the various laws governing ship's operation and seaworthiness. An English Translation of Law of Ships was added.

34. An Outline of the Law at Sea 海上法概要

Date of Publication: June, 1966. (Revised 2nd Edition)
Publisher: Maritime Publishing Company, Taipei, Taiwan, China.
Price: NT$45.00 for a volume of 187 pages.

This book consists of four parts, viz: (1) The Law at Sea in Peacetime, (2) The Law at Sea in Wartime, (3) The Law of Maritime Neutrality, and Convention on Continental Shelf.

The author gives an additional explanation on the laws according to the International Convention and the laws promulgated by the government of Republic of China under the four categories mentioned above.

35. A Study of the Systems for the Port Administration 航港管理制度之研究

Date of Publication: December, 1956.

Publisher: Research Institute of Communications, Ministry of Communications, Taipei, Taiwan, China.

Price: For free distribution. It is a volume of 45 pages.

This book deals with the various systems of the port administration of several foreign countries with suggestions to improve the system of the Chinese Maritime Administration. It contains tentative measures and rules for the organization of a port administration. It is actually a research report for the executives of the port administration.

36. The Sea Nations (Part I) 海國新志第一集

Date of Publication: August, 1957.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$ 18.00 for a volume of 128 pages.

This book introduces the historical and geographical background and improved conditions after the recent economic reconstruction of the following countries: Britain, France, Netherlands, Portugal, Switzerland, Sweden, USSR, Brazil, Chile, Peru, Uruquay, Lebanon, Cylon and Greenland. It is composed of translated articles from the publications of the respective countries.

It may be used as a supplemental lesson for students of history and geography, as well as for average people to read for pleasure.

Additional descriptions on Italy, Venezuela, and Jordan were added to it by the author in 1957. Altogether there are seventeen countries mostly covered with illustrations and biographical stories about some of their navigation pioneers.

37. The Sea Nations (Part II) 海國新志第二集

Date of Publication: March, 1961.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$25.00 for a volume of 120 pages.

This book is the second part of the book, "The Sea Nations," giving information about additional eleven nations, viz: Norway, Denmark, Mexico, Bolivia, Columbia, Puerto Rico, New Zealand, Japan, Syria, Egypt and Jordan.

Attached to this book is a brief introduction of the railways of seventy-six countries.

It is a good reference book for those studying transportation.

38. The Sea Nations (Part III) 海國新志第三集

Date of Publication: August, 1962.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$25.00 for a volume of 138 pages.

This book is the third of a series on the subject. Its composition is divided into three parts. The first part is a translation of "The Economic Miracle in Free China" which was published in English by the Information Office of the Chinese Government. The second part is a description on

the present state of America, which is translated from "Here is America", published by the State Department of the U. S. A. in 1962. The third part is a description on "The Japan of Today" which is translated from a book, published by Department of Foreign Affairs of Japan in 1961.

The book is attached with many interesting illustrations and is considered an ideal book for those studying international politics and economics, geography and human knowledge.

39. The Chinese Shipping Business 中國航業

Date of Publication: October, 1929.
Publisher: The Commercial Press, Ltd., Shanghai, China.
A volume of 159 pages.

This book has been adopted by Mr. Wang Yun-wu as the first volume of the Wan Yu Wen Ku (The Complete Library). It contains nine chapters with the author's farsighted opinions and many valuable statistical data. It is one of the author's remarkable books written during his early years and it serves as an important impetus for having written many of his later publications on water transportation.

40. The Shipping Business and Navigation Right 航業與航權

Date of Publication: August, 1930.
Publisher: Academic Research Society, Nanking, China.
A volume of 200 pages.

This book deals with the shipping business and the right of navigation. It consists of four parts. The first part explains

different kinds of navigation right. The second part gives historical account in detail of the navigation right to foreigners. The third part deals with concrete measures for recapturing the navigation right from the foreigners. It also discusses about the pros and cons in such measures. The fourth part deals mostly with proposals for the best means of recapturing the navigation right at the meetings convened respectively by Ministry of Communications, Ministry of Finance, Ministry of Foreign Affairs, and Ministry of Commerce and Industry in 1939, wherein the author personally exchanged views with the various delegates on the subject how to recapture the navigation right. So in this book there are concrete and practical proposals for the said issue.

41. The Shipping Business of China 中國航業論

Date of Publication: January, 1934.
Publisher: The Communication Magazine, Nanking, China.
A volume of 143 pages.

This is a book on the subject of the shipping business of China discussed on the basis of theories. It is divided into four chapters, viz: (1) General description, (2) The Chinese operated shipping business, (3) Foreign investment in the Chinese shipping industry, (4) General condition of the trading routes with ships plying over such routes.

42. Government Policy Concerning the Shipping Business 航業政策

Date of Publication: December, 1934.
Publisher: The Communication Magazine, Nanking, China.

A volume of 106 pages.

The book comprises three distinct categories. The first category gives general description of ten maritime countries as how to protect their nation's shipping industry. The second category contains discussions on the shipping policies of Japan, the United Kingdom, the United States of America, France, and Germany. The third category gives the personal opinions of the author for the development of the shipping industry of China.

42. Problems in Modern Maritime Administration 現代航政問題

Date of Publication: June, 1937.

Publisher: Cheng Chung Publishing Company, Shanghai, China.

A volume of 300 pages.

This book is a compilation of the author's special articles concerning shipping policy and shipping business. It deals with the problems of shipping policy and shipping industry of that time together with the author's proposals for solving such problems.

44. Water Transportation 水道運輸學

Date of Publication: August, 1945.

Publisher: The Commercial Press, Ltd. Shanghai, China.

A volume of 144 pages.

This book comprises twenty chapters in seven parts. The contents include the following: (1) The merchant vessels, (2) The shipping business, (3) The shipping routes, (4) The

port facilities and charges, (5) The shipping policies of various countries, (6) The wartime shipping policy of China and (7) The Chinese shipping policy after V–J day.

This book, dealing with both theory and practice, is the first book in China on maritime affairs with a comparatively complete record of facts. It is intended to develop opportunities for the development of Chinese shipping business after the War. It was highly recommended by the New World Manazine and three editions has been published within one and half year.

45. Sixty-year History of Communications Since the Founding of the Chinese Republic 開國六十年交通史論

Date of Publication: March 1971.

Publisher: Maritime Publishing Company, Taipei, Taiwan, China.

Price: NT$80.00 for a volume of 493 pages.

To commemorate the 60th anniversary of the founding of the Republic of China, Prof. Wang Kuang made an account of the history of Chinese communications during the past six decades. The book starts with the communications policy of the "Three Principles of the People". It elucidates Dr. Sun Yat–sen's viewpoint on communications as to the basic policy, reconstruction policy, operational policy, and managerial policy. In other words, these are the guidelines which has been followed by the Chinese Government. The second part is a brief account of Chinese communications on the Mainland. Of course, the materials are those up to 1949, i. e., before the occupation of the Mainland

by the Communists. The third part is the story of Taiwan's communications from 1945 to 1970. This portrays a dramatic progress of the railway, highway, navigation, harbor, civil aviation, postal service, and telecommunication on the island during the 25-year period under the able administration of the government of Republic of China. In the fourth part, the author explains the basic knowledge on communication engineering. This gives the readers an idea of how to build the railway, highway, etc. The fifth part comprises six articles on communications and local government, trend of world shipping industry, present status of Chinese navigation, water transportation during the Sino-Japanese War, etc. The sixth part is a collection of four treatises, two of which are on things of Bangkok, one is a description of the Sea-Wise University, and the other is about how to promote Taiwan's farm mechanization. The seventh part is the English version of Prof. Wang's three articles on modern transportation. Naturally, it is difficult to cover the whole spectrum of China's communications in a single book. However, Prof. Wang has succinctly brought out the essential points for readers to get an bird's-eye view of the 60-year history of Chinese communications.

46. On the Tour of East Sea 東海道上

Date of Publication: January, 1969.
Publisher: Maritime Publishing Co., Taipei, Taiwan, China.
Price: NT$40.00 for a volume of 146 pages.

This book is a collection of Prof. Wang's 20 articles on various subjects, of which the majority are about Japanese

harbors, ships, railroads, and scenic spots he visited during the period of his sojourn in Japan in 1968. Others are his views on harbor construction, ship-building, etc. Also included is an English treatise on development and modernization of Chinese shipping industry. The highlights are Prof. Wang's vivid description of Kobe Harbor, container wharf and container ship, mammoth oil tanker, New Tokaido Railway, and the Hakone Lake. More than 50 pictures are supplemented.

47. Navigation and I 我與航運

Date of Publication: August, 1968.
Publisher: Maritime Publishing Co., Taipei, Taiwan, China.
Price: NT$50.00 for a volume of 290 pages.

The 26 articles in this book are Prof. Wang's memoirs about his dramatic career in Chinese navigation in the past 40 years. The graphic account of his unique experience is both exciting and interesting. We all know Prof. Wang is the "Master of Chinese Navigation", but few people know his personal stories and adventures during the Sino-Japanese War. This book is both informative and instructive.

48. Navigation and I (Japanese translation) 我與航運(日文譯本)

Date of Publication: February, 1969.
Publisher: Maritime Publishing Co., Taipei, Taiwan, China.
Price: NT$40 for a volume of 245 pages.

Since the publication of Prof. Wang's book, "Navigation and I," many Japanese readers asked to have it translated

into Japanese language to facilitate those who do not understand Chinese. The book was well translated and soon had its second printing afterwards.

49. Sea Power and Navigation 海權與航業

Date of Publication: July, 1972. (Revised 2nd Edition)
Publisher: Maritime Publishing Co., Taipei, Taiwan, China.
Price: NT$50 for a volume of 262 pages.

It goes without saying that sea power is of paramount importance to a country. The most powerful nations in the world are those who have large tonnage of merchant ships. Great Britain and the United States are cases in point. If the Republic of China wishes to become a sea power, she should have more ships to go to the remotest places in the world. The pre-requisite is of course to train more youngmen to handle the ships. In other words, maritime education is of prime necessity. Prof. Wang's 35 articles in this book mainly deal with the problem of how to explore the human resources for the development of Chinese navigation and the shipping policy of the Republic of China. The ways and means he suggested are for our government and people to follow. This book is essentially the one on maritime education and policy. The highlight is his article on the history of the loss and retrocession of Chinese shipping rights.

50. Navigation and Navigation Administration 航業與航政

Date of Publication: August, 1967.
Publisher: Maritime Publishing Co., Taipei, Taiwan, China.
Price: NT$30 for a volume of 162 pages.

In order to develop the navigation of a country, navigation administration must not be overlooked. It is the responsibility of the government to see to it that the navigation companies are well taken care of, the facilities are properly provided, the harbors are impeccably constructed, and, above all, a right policy is followed. In this book Prof. Wang sounded out the importance of having a new merchant fleet, container ships, and compulsory marine insurance. He also mentioned some of the measures such as winching stations he master-minded in wartime China.

51. A Study of Dr. Sun Yat-sen's Plan of Industrialization for China 實業計劃論

Date of Publication: December, 1969.
Publisher: Maritime Publishing Co., Taipei, Taiwan, China.
Price: NT$50 for a volume of 262 pages.

Dr. Sun Yat-sen's plan for industrialization for China has been considered as the top guideline for the reconstruction of China. Prof. Wang made an analytical study of Dr. Sun's plan in respect of railway, harbor, mining, highway, and aviation. Also included are two special discussion topics on the location of the fourth international harbor on Taiwan and on the harbor and port law. This book serves a useful purpose for those who are interested in Dr. Sun's far-sighted plans.

PART VI

Book Review

The Chinese Shipping Business of China(中國航業論)

By Wang Kuang

The Communications Magazine Series

This is the best available work on Chinese shipping, by a fromer staff member of the Shipping Administration Department (Hang-cheng-ssu 航政司) of the Ministry of Communications. Ch. 1 (General) gives statistics of tonnage, etc., of Chinese shipping and shipping in Chinese waters. Ch. 2 (Chinese Shipping) has 3 valuable sections: a) the distribution of Chinese shipping in the different ports; b) history, organization and present condition of the China Merchants Steam Navigation Co. (Chao-shang chü 招商局), 20 pp.; c) private shipping companies (more than 14 companies, including the Min Sheng Co. 民生公司). Ch. 3 (Foreign shipping in China) includes data on British, American, and other firms and 9pp. on Japanese shipping in China. Ch. 4 (Navigation routes etc.) describes the various routes and shipping companies engaging in business on them. See also the author's Hang-yeh Cheng-ts'e (6.4.33), which discusses shipping policy. These two works supersede the author's other two books, Hang-yeh yü hang-ch'üan 航業與航權 (The Shipping Business and Navigation Rights), published by Hsüeh-shu yen-chiu-hui 學術研究會 (Academic Research Society,) Shai 1930, and Chung-kuo hang-yeh 中國航業 (The Chinese shipping Business), CP Shai 1933, (Fairbank: Bibliography of Modern China).

Government Policy Concerning the shipping Business (航業政策)

By Wang Kuang

Hang-yeh cheng-ts'e 航業政策 (Government policy Concerning the Shipping Business), Chiao-t'ung tsachih she ts'ung-shu 交通雜誌社叢書 (The Communications Magazine series), No. 2, published by Chiao-t'ung tsa-chih she, Nanking 1934, pp. 2 & 6 & 106.

The first two chapters of this book analyse the policies of 10 countries, including a 6 pp. section on Japan, as regards indirect measures (freight rates, duties, exemptions, ect.) and direct measures (mainly subsidies) used by governments to aid the development of their merchant marines. The last chapter summarizes the author's views on Chinese shipping policy. Appendix gives a valuable account of the shipping administration of the Chinese government (pp. 87-106).

(Fairbank: Bibliography of modern China)

Study on Communications about Dr. Sun Yat-sen's Plan of Industrialization for China (實業計劃交通論)

By Wang Kuang

Published by Maritime Publishing Company, Taipei. March, 1955. pp.269

As early as at the end of the First World War, Dr. Sun Yat-Sen-the Father of the Republic of China, published his works, "The Plan of Industrialization for China." This book was highly valued by the world. Until now, the essentials of it are still accounted by specialists as the principles for reconstruction of China. In it, the plan of communication is of paramount importance just as Dr. Sun declared in his

preface: "Among all problems in my plan, I lay stress on problems about communication, i.e. the paving of railway and highway, the excavating of canal and waterways, and the building of harbour and of town, since they are the vital tools for further developement, no matter what natural resources may lie underground."

However, It has been more than 30 years, since Dr. Sun's plan was written out. There are many alternations of the enviroment of China, in comparison with that of Dr. Sun's days, and we have enough reasons to have a check to this plan. In old days, foreign powers had great influence on the reconstruction of China. For example, they had privilage to make profit of the settlement area or concession harbour, they even built up railways upon the soil of China instead of itself. All such things Dr. Sun and every patriotic Chinese thought to be intolerable, were in the primary plan managed to avoid bad effects. But now, all the treaties of unequality have been abolished and obstacles on the way of reconstruction are swept off. Planner have more freedom in their design. Besides foreign influences, the existing establishment of railways, highways, harbour installations, power plants which were built up in need during the years after Dr. Sun's plan, must be used to the best advantage. The developement of hydraulic power, such as T.V.A. in America, offers a vivid but new example of industrialization. All these things fabricate controlling points in the betterment of planning.

The author of the discussion has served as engineer in the communication organization for score of years, and is

familiar with every aspect of the problem, His opinion or advices in compromise with the situation in China now-a-days are beyond questions adaptable, since they, in fact, are the conclusion from the investigation of all specialists. The discussion covers every topic of communication; the site of harbours, the location of railways and highways, the improvement of waterways, the establishment of shipbuilding works and the system of radio and telephone administration. His viewpoint is based on the construction progress and engineering experience. His chief opinion or revision are as follows:

(1) The site of Eastern Great Harbour and of Northern Great Harbour.

Since the return of the concessions in Shanghai and Darien, foreign influence lost its importance, we can use the existing harbour installation for a further developement, Mechanical dredging method in deepening waterways reaffirms our faith to put Shanghai and Darien into the most active seaports. Otherwise, if we are going to choose another site, not only the expense of construction will be hard to bear, but the time of completion will also delay some years. He reminds us that the economic condition annexed with natural geographical facilities froms the dominating factors in the future developement of a seaport, i.e. the designer when he chooses a site of seaport should spend more time in regulating the relation between functions of economic resources and navigating facilities. The author here listed circumstances of every seaport together with the past records

of import and export. In addition to Dr. Sun's plan. he discusses some seaports of marine bases.

(2) Railway Systems.

The author reports the records as well as histories of railways completed in the past 30 years. He suggests the establishment of railway in future should center its object on economic developement and national defence and the first step is to build up main lines for transportation. The system of railways will chiefly take the duty of transportation, from North to South, from interior land to the harbour, joining provincial capitals each other, and from, industrial centers to agricultural centers.

(3) Inland waterways.

In the improvement of river channels, the author recommends the data about the Yangtze River, Yellow River, Wei River, Chu River, Canals and ports along Yangtze River, such as Woo-Ho, port of Lake Pu-Yang and New Wu-Han port.

The book may be regarded as a general introduction to the execution of Dr. Sun's plan. Although it is too abridged as to be applied to engineering field, it will serve as reference for further economic survey of China. H. P. Chu.

(from Bulletin of the Chinese Association For The Advancement of Science)

Economics of Shipping (航業經濟學)

By Wang Kuang

The Maritime Publishing Co.

Taipei. March 1953. pp. 236

Mr. Wang Kuang is the author of many books on shipping; the Economics of Shipping is his latest outstanding work. It gives a comprehensive view of the post-war shipping status, shipbuilding industry of different nations, navigational policy and plans for the reconstruction of shipping enterprise of China, which would answer readily the innumerable questions confronting those interested in ships and shipping, whether professional or mere enthusiastic amateurs.

As we are aware, a maritime country must fully develop its navigation enterprise and shipping plays an especially important rele in the economic life of an island like Taiwan. A thorough understanding and study of shipping is, therefore, very important, and it is why this book is so widely recommended.

Shipping is a set of complicated business, a shipping businessman must be conversant with a great variety of subjects like canvassing of cargo, making of charter parties, stevedorage, and marine insurance to the indemnity of sea risk. Still more, he must know the output of productions of important ports and countries, operation cost of vessel, freight movement, and rules and regulations concerning shipping in various countries. All such problems are analyzed in the separate chapters of this book.

While this book aims at furnishing the professional shipping businessmen with valuable informations on post-war shipping enterprise and the general aspects of shipbuilding, thus presenting clear picture of the prevailing trend of shipping markets in order to help them win their place in

the keen competition, it may also serve as a guide for those who are responsible in formulating our shipping policy. For it is generally admitted that the success of a country's shipping enterprise lies in a carefully studied policy.

In the last chapter of the book is a concrete scheme for the reconstruction of our shipping business, which, if carried out, would help us greatly in the competition with other nations, and to achieve the stabilization of our economy.

T.C. Yang

(from Bulletin of the CAAS)

Ports of the World (世界海港誌)

By Wang Kuang
Maritime Publishing Company,
Taipei, 1953. pp. 340

This is recent publication on the study of ports written by Mr. Wang Kuang. From July 1951 to October 1953, Mr. Wang wrote a number of books: Ocean Transportation, Economics of Shipping, Harbours in China, Maritime Administration, Introduction to the Study of Ports, Navigation & National Defence, and Seaman's Manual. All of them were published by the Maritime Publishing Company. Transportation by water and Policy on Navigation were other works to his credit.

The present volume, aiming at a detailed introduction of world ports, gives the brief histories, geographical environment, ports' facililies, trade generalities, harbor expenses and engineering projects of the main port of the world.

In the preface, the author stresses the importance of waterway transportation in relation to harbor reconstruction. Further, he explains the purpose of his present work in this wise: "China's long coast lines and innumerable harbors and bays made close intercourse with maritime nations possible. At present, Taiwan, Free China's base, is surrounded by water and it is highly necessary that full advantage must be taken of the seas to trade with foreign nations in order to develop the island's economy. Foreign shipping and trading require a full understanding of harbors, geographical environments, ports' facilities without which one would be placed in a disadvantageous position. The prevailing business conditions of and incidental expenses for harbors are indispensable foreknowledge of the businessmen. Ignorance of market conditions would entail an incorrect budget and therefore operations seldom turn out to be profitable. To be familiar with the conditions and development of foreign ports, their projects and improvement, the present volume may answer the need of those who are interested in the study of harbors."

The book begins with a general review of the different categories of ports, their topography, facilities and expenses, and then follows with a factual and detailed analysis of over 100 different foreign ports of the world. The charts therein appended are epitomes based on actual surveys. The wealth of illustrations, totalling 132 in number, is one of the characteristics of the volume.

It is to be noted that a majority of Chinese ports have not been included in the present volume; the author's other

publications: Harbors in China and Ports of China having imparted such information. Three editions of Harbors in China were already published. Ports of China is now being published by the Chinese Cultual Press Committee. K.L. Wen

(from Bulletin of the CAAS)

History of Shipping in China (中國航業史)

By Wang Kuang

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Up to this time merchant vessel still plays the major role in transportation. The total tonnage of world vessels remains in a condition of steady increase (3,000,000 tons per year). The plan of vessel tonnage has become essential part of national budget in every country. It is true, vessel will bring their mother country wealth in peace time, it will bear up an important responsibility of national defence during the war, as well. Question of vessel tonnage would have a more close relation with a nation when she has a longer sea coast line to voyage and to watch guard. China mainland has a waterfrontier longer than 8,600 kilometers and an inland water course for navigation more than 7,000 kilometers long. Therefore, it is pressing, for China, to build up a vast, powerful fleet of vessels. In history, the prosperity and declining of a nation is, more or less, associated with the effect of her development in high sea traffic. So the navigating history of China may better be read with China History at hand for check. This book consists of four parts,

as follows:

(1) Navigation in the ancient and medieaval ages:

Owing to her boundless tract of land and unlimited man power, China is an aggressive power and a nation indulged in colonization during these ages.

Far in the remote age, as Chin and Han (秦漢) dynasties, Chinese has succeeded on the techique of shipbuilding. Accrding to the record of Japanese history, about 200 B. C. an official of Chin Dynasty Hsiu-Foo (徐福) arrived in Japan by ship with thousands of boys and girls. In the middle of two century, emperor Han-Wu-Ti (漢武帝) sent an admiral Young-P'u (楊僕) to conquer Korea. The emperor also opened transaction with oversea nations, such as Sumatra, Java, Burma, Kancipura, (in India) and Madras (in India). Fifty years later, an envoy of Roman was said to come to the capital Lo-Yang (洛陽) by way of Red sea, Indian ocean, Malaya, and Indo China. From that time cultures exchanged; foreign trade developed, with Chiao-chow (交州). Jin-Nan (日南), and Canton (廣州), as chief seaports. In early years of sixth century, Emperor Sui-Yang-Ti (隋煬帝) ordered the excavation of a grand Chnal, joining the city Tientsin (天津) on the north part with the city Hongchow (杭州) on the middle eastern part of China by water transportation, the canal extending over 700 miles. In China history, the first emperor who paid attention to maritime enterprise was Tang-Kao-Chung (唐高宗). In 662, he conquered Korea and Japan; from the time on, Japan frequently despatched special envoy together with students to China. At the same time

Chinese merchant vessels sailed far out to Persian Gulf. Foreigners (including of all mideast nationalities, as well as of every religion) inhabited at Canton, China, amounted to many hundred thousands of persons. It was said, in 1000–1400, traffic on the sea was charged in the hands of Chinese; all passengers and goods, from Calicut (in India), enroute eastward to China, would board on Chinese vessels. In 1405–1433, Ch'en-Ho (鄭和), a great navigator of China, made altogether seven voyages westward; traveled over thirty five countries, reaching Malaya, Ceylon, Siam, Thailand, Sumatra, Calicut, Aden, Mecca, (along the coast of Persian Gulf), Juba, and Brawa (on east coast of Africa). His voyages were conducted in a grand manner as he was escorted by thirty thousand soldiers loaded on sixty four large vessels.

(2) Modern history of navigation:

In the middle of Ming Dynasty (明朝) 1497, Vasco da Gama, Portuguese admiral, after the Portuguese navigators had discovered the Cape of Good Hope, (the southern point of Africa) doubled the Cape, crossed the Indian ocean. and landed on the coast of Malabar. Then Europeans (Protuguese, Spanish, English, etc), traced the footprints of him to China. The commercial transaction between China and western nations was then opened. But unfortunately they began to engage in a bitter competition in maritime enterprises in south-easten Asia with Chinese merchants. However, in China mainland all the commercial acts were proceeded on under the guidance of Chinese government, with Canton (廣州) opened, as sole seaport and the designate market

place for foreigners.

In 1842, the Opium War brought China to a bad fate in navigating competition, resulting in a unfavorable condition, such as the opening of five sea ports, the administration of custom-house under the control of foreign nations, and the right of foreign vessels navigating in inland water courses.

The first navigation company invested by Chinese capitals, was the China Merchants Steam Navigation Co. (招商局); this company was established in 1872. However, Chinese navigation companies, bounded by treaties of unequality, could hardly compete with fullplumaged foreign companies, and were often frustrated to a delaying progress. According to a statistical survey of 1934, the total tonnage of Chinese vessels was 540,000 tons, whereas total tonnage of foreign vessels amounted to 700,000 tons.

At the end of recent Sino-Japanese war, (1937-1945) Chinese vessels sunked in blocking up the waterway of Yangtze River and damaged by bombarment, were a great portion of the total tonnage; is resulted in a pitable situation (under 80,000 tons) then.

The victory of The Second World War brought up an optimistic atmosphere in Chinese navigating circle. All the treaties of unequality were abolished, and foreign vessels all beat a retreat from the inland river of China. At the same time, administration of customhouse was restored to Chinese hands. Vessels taken over from Japan together with that bought from America, set the total tonnage to a peak as 1,159,897 tons.

(3) Transition of foreign navigation companies:

The first vessel sailing into China was The English "Jardine" in 1835. Until the outbreak of Opium War, steamships sailing along Chinese seaboard increased into twenty vessels. Then the number was increased with the advance of time. Until 1937, the nationalities of foreign vessels included English, Japan, U.S.A., Norway, Portugual, Denmark, France and Italy. Among all these navigation companies, the vigorous and powerful of them were Butterfield and Swire, Jardine Matheson Co., and Nisshin Kisen Kaisha., D'alien Shosen' Asiatic Petroleum Co. and Shanghai Union Steam Navigation Co.

(4) Transition of China Merchants Steam Navigation Co.

The story of this company is a struggling record against foreign aggressive forces; and it may be looked upon as an exponent of other companies as the fate of these companies also hinged closely on the fate of whole China.

At the very beginning, the main business of the company was to transport rice crop for the government. But later on, it entered into competition with foreign companies on carrying passengers and cargo. So this company had to face a bitter struggle against foreign aggression. At first it won victory over her chief rival, Shanghai Union Steam Navigation Co., Then it confronted the joint pressure of Butterfield and Swire, and Jardine Matheson Co., and in consequence reached a mutual agreement. In 1885, this company was converted

to all private investment, and began to take up its business as an insurance company. However, in 1932, the company again converted to wholesome government capitals. The business of the company seemed to be especially entangled with the political influence; alternations of capitals took place increasingly. Besides it is so closely effected by the fate of China, the company declined during the Second World War, and prospered as the victory had come.

The book would serve as a good reference book. The author has compiled it from many sources in collecting materials such as files and documents of government. The only defect of this book is the lack of statistical charts to serve a more comprehensive basis. Albert Chu.

(from Bulletin of the CAAS)