Forty Years of Mathematical Studies*

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(Translated by C. T. Chong)

The ten or more years that I have spent abroad have been absolutely enjoyable. Discussions on mathematics with my colleagues take place daily, and one does not seem to feel the loneliness and cynicism that are normally associated with life in the ivory tower. My homecoming this time brings together my family and friends, and as a result it also brings back memories of my past years. It is indeed my great fortune to have been able to know and to become a good friend of some of the great mathematicians of our time. While mathematics is gradually gaining appreciation from society these days, there are a few historical facts about which the readers might be interested to know.

I was born on the 26th of October, 1911, in Jiaxing [2], Zhejiang [3]. My grandmother rather pampered me during my early childhood, and so I often managed to keep myself away from school. Occasionally a tutor

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would be hired to teach me at home, but then always only for a short while. An aunt who was not married taught me my very first lessons on the Chinese classics. My father was away working as a government official. I remember once when he came home for New Year he introduced me to the Arabic numerals and the four basic rules of operations of elementary arithmetic. We had then with us a three-volume Bi Suan Shuxue [4], the problems in which I attempted after he left home. There were quite a number of them, and I think that I solved most except possibly the hardest ones. As I supposed that any child could have done those sort of problems, I did not even bother to tell anyone about it.

By the autumn of 1919, my grandmother felt that I should really go to school, and so I entered the fourth year of an elementary school set up by the county. The third and fourth year students, totalling to about 30, shared the same room. On the first day of school I had my home-made lunch in the classroom. The rest of the students went away, leaving me behind feeling rather lonely. Just before class dismissal at 4 o'clock, the teacher somehow picked up the ruler and gave each student, except me, one to four strokes. I guess I got away for good behavior.

After this incident I refused to go to school anymore. Another year was spent playing around at home. In the following year (1920) I sat for the entrance examination at the church-organized Xiuzhou High School [5]. My standard in Chinese classics was then about average, but

as I had previously worked on the problems in Bi Xuan Shu-xue, the part on mathematics presented no difficulties to me. Thus I successfully enrolled at Xiuzhou.

In the autumn of 1922, my father took up an appointment at the Tianjin [6] court, and decided to move the family to Tianjin. We lived in the Hebei [7] district, in the vicinity of the Rotary High School set up by the Ministry of Transportation. The following winter I enrolled there as a first year student in the second semester.

During my years at Rotary, I was under the so-called 'old system' by which it took four years for a student to graduate from high school. Just a year before my graduation, my father's friend Mr. Chien Bao Zhong (Zhuo - Ru) came to take up a professorship at Nankai University [8]. Mr. Chien specialized in the history of Chinese mathematics, and was an impressive contributor to the subject. As he lived alone at Nankai, he visited us quite often and on several occasions my future was discussed. Entering Nankai thus became one of the possibilities.

A good portion of the students at Rotary were children of railroad workers, and most of them opted for railroad careers upon graduation. As such, prominent among their choices were Tangshan [9] and Zhiaotung [10] Universities. Because of their influence, my first choice was Tangshan.

There were however two events which affected my plan. First of all the political situation in the north was unstable at that time; even the railway track which linked Beijing [11] with Shenyang [12] operated only intermittently. Hence the traffic problem would have had to be

faced if I were to take the entrance examination at Tangshan. Secondly, my grandmother passed away during that summer (1926) and my family was preparing for her funeral. As a result I remained at Tianjin and applied to both Nankai and Beiyang [13]. Since I had only four years of high school, I was only allowed to sit for the pre-university examination at Beiyang, while Nankai allowed me the university entrance examination. That was equivalent to skipping two years of education for me. Naturally this influenced my eventual matriculation at Nankai.

Because of my lack of preparation, it was feared that the decision to sit for the Nankai entrance examination was made a bit too hastily. The main topic in mathematics was Analytic Geometry which I had never learned before. The physics and chemistry courses that I took at Rotary were also insufficient. There was chaos back at home where my grandmother's funeral proceedings were being conducted. In spite of all these, I managed to get admitted to the University. Later Mr. Chien Zhuo-Ru told me that I ranked second in the mathematics paper. It so turned out that mathematics was my trump card in every examination, and it always pulled up my average grade.

The faculty of science at Nankai was divided into four departments: mathematics, physics, chemistry and biology. They were respectively headed by Messrs. Jiang Li-Fu [14], Rao Su-Ren [15], Chiu Zhong-Yue [16] and Li Ji-Tong [17]. These departments were more or less 'one-man' departments since there were not too many prof-

essors apart from the four. Both my father and I did not have any idea as to what subject I should study, nor did we foresee what sort of a job I could take up after graduation from university. However, it was felt that physics appeared to be a more practical subject, and so I leaned more towards physics when I first enrolled.

Having skipped two years of education, I did encounter some difficulties in the beginning. I took a Qualitative Analysis course in chemistry taught by Mr. Chiu Zhong-Yue. The teaching assistant was one Mr. Zhao Ke-Jie [18], alias Tiger Zhao, famous for his strict discipline. During the first laboratory session, we were each assigned a cupboard with equipment inside. Along with it we received a note listing in English the names of those equipment. Our first job was to make sure that everything listed was in the cupboard. My previous experience in doing experiments was almost nil, and so I simply had no idea how the names in the note should correspond to the equipment in the cupboard. Then the lesson for the day was glass-tube blowing, which naturally I did not do well. Fortunately an employee in the chemistry department was in the laboratory and helped me blow one just before the end of the session. Holding the glass-tube in my hand, I felt that it was still very hot. I turned on the tap to let cold water run through it, thus wasting all efforts.

After this, I thought for a few days and decided that chemistry was definitely out for me. Therefore I dropped chemistry and took a course in Elementary Mechanics. In those days at Nankai, students did not have

to decide on their majors until their third year. Since I made up my mind to give up chemistry, mathematics became the only possible major for me in the faculty of science.

During that year, Mr. Jiang was on leave at Xiamen [19] University, and Mr. Chien was the only man left in the mathematics department teaching us Calculus and Mechanics. In addition to these I also took courses in Chinese classics, English, and physics which was taught by Mr. Rao. Though he was a learned scholar and proficient in both Chinese and English, I did not do too well in physics as it covered too many ramifications. However, I had no difficulty whenever the course had something to do with mathematics. There was therefore no problem in passing it even when I had hardly understood the basic concepts of physics.

The first year at university was very comfortable. Calculus and Mechanics required only solving problems. It was not necessary to spend much time on Chinese classics and English as the final grades would not have been affected one way or the other. There was only one laboratory session in physics and this took some effort. As to understanding the course contents, I had already given up the idea. My attitude towards doing experiments was to take only the basic measurements and simply fill in the rest of the data, so that the whole procedure took a very short time to finish. Yet because of this I was able to gain a slight understanding of what went on in the course.

When in Taibei [20], a newsman asked how I decided to become a mathematician. I said that I was poor

in Chinese and English, and worse in doing experiments. Mathematics was therefore the only choice left. This reply was in fact quite truthful. In retrospect, the choice of my career had actually long been decided. In comparison with those who are gifted in various skills, my problem of choice was relatively simple, and in my life I have certainly benefitted tremendously from this.

During that year I also spent a lot of time reading novels and books of various sorts, and often helped others to write their compositions. Even though I was poor in Chinese and English, some of the others were even worse. I wrote fast, finishing two or three compositions each time. The best ones I kept for myself, while the rest I gave to others. The grades that they received, however, were occasionally better than mine. Most of my friends during my first year were mediocre students; I frequently rendered them service by doing various kinds of assignments for them, just to pass away the time.

In 1927 I was promoted to the second year, and my attitude towards study underwent a great change. In that year, Mr. Jiang returned to Nankai. He was, judged by any standard, truly a man of exemplary character and great integrity (I recall that Mr. Hu Shi-Zhi [21] had also mentioned something of the like in an article published in the magazine Independent Critique [22]). He took his job very seriously, offering encouragement and guidance from time to time, imparting to the students the joy of doing mathematics and the feeling of its bright future. Under his directorship the mathematics library improved

its collections, and I began to be able to look up books.

Another student who was influenced at least just as much was my schoolmate Wu Da-Ren [23] (a cousin of Da-You [24]). Da-Ren was an absolutely talented person. He graduated from Nankai High School, was exempted from entrance examination, and received a four-year scholarship. He excelled in every subject. In those days people who graduated from Nankai High School formed their own group in the first year; hence I had very little contact with him. But from the second year till graduation, Da-Ren and I became very close friends. Da-You was a year ahead of us, and was also more mature as a person. So even though we took the same courses together, and knew each other well, we were not as close.

Chinese mathematics during that period was very weak. In the north there was Mr. Feng Zhu-Shuen [25] (Han-Shu) at Beijing University. In the south at South-east University there was Mr. He Lu [26] - an older generation mathematician who studied in France - and Messrs. Duan Diao-Yuan [27] and Xiong Qing-Lai [28]. Messrs. Hu Ming-Fu [29] and Jiang Li-Fu were at that time the only two Chinese who obtained Ph.D's in mathematics from abroad (both at Harvard). Mr. Hu Ming-Fu contributed greatly to the setting up of the Scientific Society of China and to the publication of the journal Science. Unfortunately he died soon after his return to China, and was therefore not able to offer further his talents to the development of Chinese mathematics. His papers and those of Mr. Yu Da-Wei [30] on Mathematical Logic were perhaps the first ones written by Chinese that appeared in major inter-

national mathematical journals.

The mathematics program at Nankai was then known for its solidness. Mr. Jiang put a great deal of effort in his work: after each lecture, exercises were given, and these exercises were in turn carefully gone through. Before I entered Nankai, two of his students Liu Jin-Nien [31] and Jiang Jé-Han [32] were studying at Harvard, while Shen You-Cheng [33] remained at Nankai to teach. One could already see the dawn of a new generation of Chinese mathematicians.

Da-Ren and I were the best mathematics students at that time. Mr. Jiang was very pleased with us, and conducted several courses which were regarded as very advanced and difficult: Linear Algebra, Complex Function Theory, Differential Geometry, Non-Euclidean Geometry, etc. Indeed I received all of my basic training in mathematics from Mr. Jiang. I had always been fond of browsing around. In 1930 when I graduated I had already read a number of research papers in some mathematical journals.

During these years Qinghua [34] was turned into a university and was expanding vigorously. It decided to set up a graduate school in 1930, the year that I graduated. I had seen clearly that going abroad was the only way to further my studies. My family, however, was not able to provide me with the necessary financial support, and so I had to look for a scholarship somewhere. Occasionally Qinghua would offer scholarships for overseas studies, but this was not done every year and in any case mathematics need not be among the list of subjects offered

for scholarships. However, the Qinghua Graduate School did set down the rule that the excellent students would be sent for further studies overseas upon graduation. Thus after numerous discussions, Da-Ren and I decided to apply to Qinghua.

My other purpose for applying to Qinghua was to work under Mr. Sun Guan-Yuan [35]. Mr. Sun graduated from Nanjing [36] Teachers' College and received his Ph.D from the University of Chicago, specializing in Projective Differential Geometry. He was at that time the only Chinese to be publishing mathematical papers in international journals, and was also the first Chinese to have continued research after the Ph.D. degree. Under his supervision, I published my first paper in 1932 in the Qinghua Science Report. Later I wrote two more papers on this subject, both published in the Tohoku Mathematical Journal in Japan.

Da-Ren and I were both admitted to the Qinghua Graduate School. But due to domestic reasons, he took up a teaching assistantship at Zhongshan University [37] in Guangzhou [38]. Since I was the only student at the Qinghua mathematics department, they decided to postpone the setting up of its graduate division, and hired me as a teaching assistant instead. Thus it was not until 1931 that I became a graduate student. As I was admitted during its first year of operation, my matriculation number was 002, which became a topic of conversation for my friends. Actually the matriculation numbers were given according to the alphabetical ordering of our names in English, with

no special meaning attached to them.

Gradually Qinghua became one of the nation's top institutions, especially its faculty of science. In the mathematics department there were Professors Xiong Qing-Lai, Sun Guan-Yuan, Yang Wu-Zhi [39], and Zheng Tong-Sun [40] who later became my father-in-law. Messrs. Zhou Hong-Jing [41] and Tang Pei-Jing [42] were also on the teaching staff. There were also a number of excellent students, for example Zhuang Qi-Tai [43], Xu Bao-Lü [44], Ke Zhao [45] and Xu Shen-Xiu [46].

It was very pleasant to work with Mr. Sun Guan-Yuan because of his straightforward manner and friendliness. I spent a lot of time reading papers in Projective Differential Geometry, but unfortunately it was only a side branch of mathematics. Research work on Projective Differential Geometry by that time was reaching its last stages and I began to feel its lack of depth. Later in my career I again wrote a few more papers on this subject, but they were all done to ease the tension caused by unsuccessful attempts to solve difficult problems. The importance of research began to be appreciated by the Chinese mathematical community, but no one knew where its mainstream was.

One man at the Qinghua department of mathematics who attracted most attention then was Hua Lo-Geng [47]. Lo-Geng came from Jingtang [48], Jiangsu [49], same hometown as Pei-Jing.

After graduation from high school, Lo-Geng discontinued his studies and spent the time at home teaching

himself mathematics. Having come from the same hometown, Lo-Geng corresponded quite often with Pei-Jing discussing mathematics. There was a journal to which someone sent a "proof" of the solution by radicals of quintic equations, which somehow the editor published. Lo-Geng spotted the error in the paper and so the mathematics department decided to appoint him as its librarian. He came to Qinghua in 1931 and was assigned a desk just outside the chairman Mr. Xiong's office. Before long he became the central figure of the department. Lo-Geng was a very active man; his interests ranged from discussions on all kinds of academic subjects to dealing with departmental matters. He was beyond any doubt very gifted in mathematics. He worked ten or more hours every day, and so very soon his mathematical papers began to appear in international journals. He contracted typhoid in his youth and as a result became lame. He made important contributions to Number Theory, Algebra and the Theory of Functions of Several Complex Variables. There are numerous stories about him. I remember once after a certain German mathematical journal accepted one of his papers for publication, he stood in front of the science building, shaking hands with whomsoever he saw, telling the good news.

In 1932 Mr. Hu Kuen-Shen (Shu-Zhi) [50] came to assume a lectureship. Mr. Hu specialized in the Calculus of Variations, and had written an excellent Ph.D. thesis (University of Chicago) of rare quality. He was a quiet and reserved man, extensive in learning; yet his reputation fell far short of his achievements. Soon he left to

become professor at Central University [51]. I heard recently that he has passed away. One cannot help missing this pure scholar who had no urge for fame nor success.

During this period there were some scholars who came to visit us. In mathematics there were George Birkhoff from Harvard and Wilhelm Blaschke from the University of Hamburg in Germany. Mr. Blaschke was a famous geometer. He gave a series of lectures entitled 'Topological problems in Differential Geometry'. The lectures went to the heart of the subject; yet they were intelligible to the general audience, thus opening up my vision of mathematics. At this time I started to consider seriously about studying at Hamburg.

My four years' studies (1930 - 1934) at Qinghua were not too hectic. Naturally then I spent the time reading more books and learning to write papers in Projective Differential Geometry. It was during that period that I decided to take up Differential Geometry to be my field of research. Differential Geometry originated from the applications of Calculuss to Geometry, having had a history of more than 300 years. Ever since Einstein's Theory of Relativity, there has been a constant search in Geometry for a model of physics. A number of geometers have been working on it, but unfortunately not much result has come up to date.

The right approach to Differential Geometry is the so-called 'Differential Geometry in the large', i.e. the study of geometrical properties of differentiable manifolds. It is closely related to Topology, and a systematic

investigation in this direction was just beginning at that time. This was the approach which I envisioned but was unable to carry out during my years at Qinghua. The feeling was like seeing a mountain from afar, captivated by its supreme beauty, yet not knowing how one could climb it.

After 1930, there was a considerable improvement in the quality of Chinese mathematics. Many students who went abroad and successfully completed their studies returned. There were Messrs. Jiang Je-Han and Shen You-Cheng at Beijing University, and Messrs. Chen Jian-Gong [52] and Su Bu-Qing [53] at Zhejiang University. Other places like Central, Zhongshan and Wuhan [54] Universities also raised the standards of their mathematics departments. In particular, under the direction of Messrs. Chen and Su, Zhejiang University had a large number of mathematics students working very hard. Regrettably their way of teaching, which may be called an 'apprentice system', required students to continue working on their teachers' problems, thus preventing them from excelling the teachers. For science to develop, it is imperative that scientific workers be given freedom in research. This is something worth pondering upon.

In the summer of 1934 I graduated from Qinghua Graduate School and was awarded a two-year scholarship to study abroad. The Qinghua scholarship was normally awarded for studies in the United States, but I was given the approval to go instead to Germany to study at the University of Hamburg. The University of Hamburg was not

established until after the first world war, but already its department of mathematics was very famous. In that year Hitler assumed power in Germany and began to deport Jewish professors. Classes at older universities like Göttingen, Berlin, etc., were often disrupted. Fortunately the mathematics department at Hamburg maintained a relatively peaceful atmosphere and so was able to continue lively research activities. It was therefore still an ideal place for a mathematician to visit.

In addition to Blaschke, there were two other professors at Hamburg: E. Artin and E. Hecke. Artin was the most outstanding of the three. He was one of the pioneers of modern Abstract Algebra, but his interests covered all of mathematics. His lectures and papers were known for their organization, rigor, and ingenuity. Theories which were difficult to understand became natural after he had arranged and gone through them. He became a full professor in his twenties; yet he was absolutely amiable and still looked like a student.

I arrived at Hamburg in September even though the academic year did not start until November. In early October, Mr. Blaschke returned from his vacation and gave me the papers which he had just written. Before school started I found a gap in the proof of a theorem in one of the papers. He was very pleased and asked me to try to fill up the gap. That I managed to do, resulting in my first research work at Hamburg. In the German university system the most important requirement for a doctoral degree is the thesis, and the supervising professor can

virtually decide on the awarding of the degree. So after all I gave Mr. Blaschke a good first impression.

Soon Hamburg became the Mecca of Chinese mathematicians. In that year Mr. Jiang Li-Fu was on sabbatical leave and came to Hamburg. Then there were Zheng Jiong-Zhi [55], Chen Yu-Huai [56], Zhou Wei-Liang [57] and others. Zheng and Chen had earlier obtained their doctoral degrees from Göttingen. Jiong-Zhi worked under the female mathematician Emmy Noether. His thesis is the famous 'Zheng's Theorem', which is a fundamental contribution to Algebraic Geometry. Jiong-Zhi was a sincere and straightforward person well liked by everyone. Unfortunately he died during the war in Xichang [58], Sichuan [59]. Noether was one of the leaders in Abstract Algebra, acknowledged by all to be the greatest female mathematician of all times. Indeed she belongs to the top class even when placed among male mathematicians.

Wu Da-Ren was one of those who came to Hamburg in 1935. He was the first recipient of a scholarship awarded for studies in the United Kingdom, and had transferred to Hamburg from the University of London. Zhang He-Rui [60], Yuan Bing-Nan [61], Jing Zhai-Xin [62] and others joined us subsequently. Chen Shou who was Da-Ren's wife also studied mathematics. Mr. Blaschke travelled quite often, and so I had most of my mathematical contacts with Mr. E. Kähler. At that time Mr. Kähler had just finished writing a paper which included the discovery of what became known later as 'Kähler Manifolds'. He was a teaching assistant of Mr. Blaschke, very broad in knowledge,

very friendly towards people, and was then at the prime of his creative career. He wrote a booklet entitled The Theory of Systems of Differential Equations, expounding the theories of the great French mathematician Elie Cartan. The booklet contained a fu ndamental theorem now known as the Cartan-Kähler Theorem. Mr. Kähler organized a seminar to work on his book; but the theory was too complicated, and so, like the fate of any other seminar, the size of the audience slowly dwindled. I managed to fight to the end, and was therefore probably the one who benefitted most out of it.

Through his seminar I began to gradually see the great genius of Cartan as a mathematician. Mr. Cartan's papers were famous for their unintelligibility. I began to get used to his way of reasoning, and felt that in fact it was the most natural way. My doctoral thesis was on the applications of Cartan's methods to Differential Geometry. It was a solid piece of work, but nothing spectacular. I had finished my thesis in the autumn of 1935, but as I had to wait for Mr. Blaschke's return, I received my degree officially in 1936.

Since Mr. Zhou Wei-Liang's future wife was from Hamburg, he spent a lot of time there even though he was registered as a student at the University of Leipzig. He received his degree in the summer of 1936. The contents of his thesis included the so-called 'Chow (Zhou) co-ordinates', a very important result in Algebraic Geometry.

By modern standards, Hamburg was not a big mathematical center in terms of size. However, it had first

rate leaders; therefore excellent students. My two years at Hamburg as a student was really enjoyable.

When my scholarship expired in the summer of 1936, I was offered teaching appointments by both Beijing and Qinghua Universities. But I decided to go to Paris to work under Cartan for one year. I received financial assistance from the China Cultural Foundation for this project. The year in Paris had a definite impact on the development of my mathematical research. Not only was Mr. Cartan a great mathematician but he was also very friendly, informal, and an excellent teacher. He was Professor of Geometry at the University of Paris. During his office hours there were always so many students waiting to see him that they had to line up. Fortunately after two months he allowed me to visit him at home. I went there once every two weeks and always received a long letter from him the next day, further expressing his opinions on problems discussed the day before. I worked extremely hard during the ten months in Paris, and I learned a lot more than the papers I published at that time would manifest.

In 1937 I left France and returned home via the United States to become professor at Qinghua. However, Japan declared war on China before I left Paris. Even though my itinerary was not changed, I travelled with a heavy heart. I passed by Xianggang [63] and Changsha [64] and arrived at Kunming [65] to teach at Southwest Associated University [66] for six years. Life during wartime does not fall within the scope of this article. Still it is worthmentioning that during that time I had with me a

collection of copies of mathematical papers of Cartan and others. So even though we were forced to move from place to place because of the war, I did not abandon my work completely. In fact as the University could not carry out its normal functions during wartime, I acquired more time to do my own work, and so continued to publish research papers. Among the nation's scholars, I gained recognition as one of the reputable mathematicians. Even internationally some people began to notice me. Yet deep inside I was very dissatisfied with my results, and was not willing to remain silent for the rest of my life.

My leaving Kunming for Princeton in 1943 was a major decision. The war was then at its peak. Travelling between China and the United States was very difficult. One possibility was to fly from Kunming to India, take a boat, passing the Cape of Good Hope, sail to the Atlantic Ocean, and arrive at America. In view of the activities of the German submarines, this route naturally presented a considerable danger. However, I had decided to visit the States and so was willing to take all risks. Mr. Veblen [67] liked my work very much and managed to obtain financial assistance for me. Eventually, I travelled in a military aircraft in mid-July, and spent seven days passing through India, Africa and South America, and arrived at Miami.

Immediately after arriving at Princeton, I obtained a really important result, namely a new proof of the so-called Gauss-Bonnet Formula. Within two years I published several papers which constituted my most origi-

nal and significant contribution to the subject of Differential Geometry. The work on the so-called 'Chern characteristic classes' was done during that period. The greatest geometer of modern times, Mr. Heinz Hopf, when reviewing one of my papers, commented that 'Differential Geometry has entered a new era'.

After the war I returned home in 1946, and was assigned to set up the Institute of Mathematics of the Academica Sinica. Officially the Institute was under the directorship of Mr. Jiang Li-Fu; but Mr. Jiang was in Nanjing [68] only for a few months, and so from 1946 to 1948 I administered all plans. My policy was 'to train new people', and so the Institute admitted a large number of recent university graduates, lecturing to them 12 hours a week, introducing the essence of modern mathematics. In the Institute there were research members like Hu Shi-Zhen [69], Wang Xian-Zhong [70], Li Hua-Zhong [71] and others. There were also assistants who later showed exceptional performance: Wu Wen-Jun [72], Yang Zhong-Dao [73], Chen Guo-Cai [74], Liao Shan-Tao [75], Zhang Su-Cheng [76], etc. I am very pleased that today the Institute continues to carry out this policy of 'training new people'.

Before ending this article, I would like to mention two thoughts in my mind. First of all, in my life I have had many teachers and friends from all places, and many of those who are more intelligent than I am probably did not achieve as much as I did. I suppose that I benefitted from two Chinese proverbs which serve to encourage myself, namely the spirit of 'each new day brings forth

new challenges; each challenge gives birth to a new day [77]', and the pursuit of 'to ascend to summit; to attain the ultimate [78]'. Always work on important problems. Even if most attempts do not yield results, and failures occur more often than successes, whatever little achivements gained are enough to comfort the heart. Mr. Yang Wu-Zhi wrote me a poem saying 'All by himself climbeth he the highest tower', for which honor I think I do not deserve. Yet as far as attitude towards work is concerned, he certainly understands my feeling very deeply.

Secondly, a British gentleman at the Chinese University of Hong Kong said to me that China has not produced a scientist of the first rank. Mr. Li Ji-Zhi [79] also once said that science has not yet established its roots in China. With both of them I share the same feeling. Actually, how many second or third rank scientists has China produced ? Professor Yukawa of Japan had never left his country before his great work on the meson was accomplished. In comparison, one sees how much hard work remains.

Glossary

(Names which are also known in other forms are given in parentheses)

[1] 傳記文學
[2] (Kashing) 嘉興
[3] (Chekiang) 浙江
[4] 筆算數學, a mathematics problems book
[5] 齊州
[6] (Tientsin) 天津
[7] (Hopei) 河北
[8] 南開
[9] 唐山
[10] (Chiaot'ung) 交通
[11] (Peking) 北京
[12] 瀋陽
[13] 北洋
[14] 姜立夫
[15] 饒樹人
[16] 卿宗岳
[17] 李繼侗
[18] 趙元任
[19] (Amoy) 廈门
[20] (Taipei) 台北
[21] 胡適之
[22] 獨立評論
[23] 吳大任
[24] 吳大猷, physicist
[25] 瀋祖荀
[26] 何魯
[27] 段調元
[28] 熊慶来
[29] 胡明復
[30] 俞大維
[31] 刘晋年
[32] 江澤涵
[33] 申又棖
[34] (Tsinghua) 清華
[35] 孫光遠
[36] (Nanking) 南京
[37] 中山大学
[38] (Kwangchow) 廣州
[39] 楊武之
[40] 郑桐蓀
[41] 周鴻經
[42] 唐培經
[43] 莊圻泰
[44] 许寶騄
[45] 柯召
[46] 徐賢修
[47] (Hua Lo-Keng) 華羅庚
[48] 金壇
[49] 江蘇

[50] 胡坤陞

[51] 中央大學

[52] 陳建功

[53] 蘇步青

[54] 武漢

[55] 曾炯之

[56] 程毓淮

[57] (Chow Wei-Liang) 周煒良

[58] 西昌

[59] (Szechuan) 四川

[60] 張禾瑞

[61] 袁炳南

[62] 金再鑫

[63] (Hong Kong) 香港

[64] 長沙

[65] 昆明

[66] 西南聯合大學

[67] Oswald Veblen, then at the Institute for Advanced Study, Princeton

[68] 南京

[69] (Hu Sze-Tsen) 胡世楨

[70] (Wang Hsien-Chun) 王憲鍾

[71] 李華宗

[72] (Wu Wen-Tsun) 吳文俊

[73] (Yang Chung-Tao) 楊忠道

[74] (Ch'en Kuo-Tsai) 陳國才

[75] 廖山濤

[76] 張素誠

[77] 日新日日新

[78] 登峯造極

[79] 李濟之