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Boynton, Grace 1943
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File Yenching

Chemistry in China

Compliments of

WILLIAM H. ADOLPH[1]

MANY of mankind's early discoveries have been attributed to the Chinese. A glance through modern literature on the growth of the industries reveals the frequently occurring sentence: "This process was first discovered by the Chinese." I have a feeling that the list of discoveries attributed to the early Chinese is longer and more inclusive than it should be, but among these there are certain items which are beyond doubt Chinese in their origin.

Early Chinese Chemical Industries

Of all the industrial products connected with China, silk seems to be the oldest. Pieces of silk fabric have been found dating back to about 1300 B.C.; it is probable that it goes back even beyond that to prehistoric times. History says that somewhere about 100 B.C. China sent a diplomatic mission into central and west Asia, the result of which was the opening of the trade route through Turkistan to the eastern shores of the Mediterranean, which we now refer to as the great Silk Road. The luxury-loving Romans used so much silk that Rome suffered an adverse trade balance with Asiatic countries, a negative balance estimated at no less than half a billion U. S. dollars. It has even been suggested that this unfavorable trade balance was one of the important causes of the downfall of the Roman Empire!

How silk was produced remained much of a mystery in Europe. Vergil describes silk as a kind of vegetable product that is "combed from trees". The Chinese apparently were successful in guarding their valuable trade secret. Later, however, the Byzantine emperor, about 550 A.D., sent emissaries to China, who finally succeeded in bringing back with them some silkworm eggs which they had smuggled out of the country inside a bamboo cane. From these, the millions of silkworms that form the basis of the silk industry of Italy and France are descended.

Paper is an item whose beginnings in China can be very clearly traced. Bamboo strips and also silk were used by the early Chinese as writing materials, but one was too bulky, the other too expensive. A Chinese scholar, Mo Tzu, 500 B.C., used to take along with him three cartloads of bamboo books when he traveled. Some new material was needed, and paper was invented in 105 A.D. by Ts'ai Lun. Samples of the world's earliest paper have been unearthed in the dry deserts of Chinese Turkistan which date from within 50 years of Ts'ai Lun's discovery. Six centuries later the Arabs captured some Chinese soldiers in central Asia and from them learned how to make paper. The rest of the story about its spread into Europe we know.

Printing of course is the sequel to paper. It seems to have developed from the use of stamp seals. It is known that actual books were printed in China in the 9th century. The world's oldest existing printed book is a Buddhist text dated A.D. 868. The famous edition of the Chinese classics, a real large-scale printing job, is dated about 950 A.D. This was block printing; movable type came about a century later.

Porcelain is another important product from China. Some historians trace porcelain back to 300 A.D. Chinese porcelain appeared in Europe from 1500 A.D. on, but it was only in the year 1709 that true porcelain was successfully produced in Europe, accidentally, we are told, near Dresden. European porcelain apparently came as an independent invention.

Gunpowder is without doubt Chinese in origin. In early days, say about 700 A.D., the Chinese used fireworks and later in 1161 A.D. gunpowder was used to repel a foreign invasion. And thereby begins the history of its use in warfare.

White lead, there is some reason to believe, was also known in early China. We know that Europe traded in the early days with southeast Asia and one suggestion has it that Dutch traders brought back with them on one of these voyages the Chinese formula for white lead. The process, according to this report, was introduced into Holland and thereupon became known as the "Old Dutch process".

Zinc also goes back to an early date in China. The Chinese had learned to isolate this metal and use it in alloys. There is an account of an Englishman, Isaac Lawton, who was sent to China in the 18th century for the express purpose of learning the Chinese method of zinc refining.

The early Chinese literature treats the subject of alloys. There is among others the copper-nickel-zinc alloy, familiarly known as white copper, which has long been used in China. About 1600, European mention is made of *paktong* (white copper) as one of the items of export from Canton to Europe. From 1750 on, German imitations began to appear on the market and today, instead of carrying the Chinese name, white copper, this alloy bears the trade name "German silver"!

I am not certain that a catalog of things like this belongs to chemistry; perhaps these discoveries were just crude responses to crude human needs. The Chinese culture was an early culture and the Chinese were responsible, no doubt, for many material advances long before the European world had developed a need for them. But, on the other hand, outside of the few I have named, the tendency has been, I believe, to consider the hoary annals of Chinese history a convenient dumping ground for disposing of clouded beginnings.

The Chinese Alchemists

The history of chemistry proper reaches back into the very early centuries. There was an age of alchemy and also an age of iatrochemistry (medical chemistry) similar to that found in early Egypt, India, and Arabia. China's age of alchemy antedated by many centuries the alchemy of medieval Europe. Chinese alchemy also was concerned with two objectives: first, the search for the philosopher's stone which would turn base metals into gold, and second, the search for the elixir of life. Closely connected with these were investigations on alloys. The Chinese to a greater degree than their occidental compeers seemed to have been intrigued by the alloys. In the alloys the metals, it was supposed, were combined in rhythmic ratios. Ancient China knew five metals and the hardware store in China today is still called a "five-metals shop". These five metals were gold, silver, copper, iron, and tin. Attempts were made to combine and recombine these metals to make the ideal alloy.

The earliest known treatise in any language devoted entirely to the subject of alchemy is the Tsan Tung Chi. It

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bears the date 142 A.D. Probably the best known of these early alchemist philosophers was a medical writer Ko Hung, known also as Pao Pu Tzu. His directions for preparing the "pill of immortality" read:

> Take three pounds of genuine cinnabar and one pound of white honey. Mix. Dry the mixture in the sun. Then roast it over a fire until it can be shaped into pills. Take ten pills the size of a hemp seed every morning. Inside of a year, white hair will turn black, decayed teeth will grow again, and the body will become sleek and glistening. If an old man takes this medicine for a long period of time, he will develop into a young man. One who takes it constantly will not die and will enjoy eternal life.

This does not differ greatly in flavor and in tone from the writings of our own Paracelsus and his colleagues, but it antedates Paracelsus by about a thousand years!

The fact that Chinese alchemy had the same two objectives—that is, the philosopher's stone and the elixir of life—would suggest a link between China and Europe. Our alchemy came from the Arabs. Now, while there is little positive evidence, we do know the Arabs made voyages to southeast Asia and it may be that the alchemy which we trace back to the Arabs, they in turn borrowed from the Chinese. Or—another way of saying this—it may be that the investigations which culminated in the atomic bomb were begun in China 1,500 years ago!

Inaccurate Thinking

What we can call the medieval period in chemistry held sway in China till the close of the 19th century. We study in vain the history of this period for examples of first-class inductive thinking. Two hundred years ago, China and the Occident were probably at the same milestone. It is just during the last two hundred years that the Occident has forged ahead while China stood still.

Instead of scientific thinking we find in the last century and even at the present day a delightful spirit of inaccuracy. The foot, for example, is the unit of linear measurement, but a foot was anything from 10 to 16 inches, depending upon whether you measured cloth, silk, lumber, or something else. The *li*, another unit, roughly a third of a mile, varied somewhat depending on whether you were going up hill or down hill. It became a unit measuring the degree of difficulty or inconvenience in travel. There is something very intriguing about all this; it suggests an important factor which we do not ordinarily measure. It points to an attitude of mind, however, that tends to retard the introduction of scientific thinking. In one of our early nutrition surveys, we found that the *chin*, a unit of weight, varied from 0.7 to 1.8 lb. avoirdupois.

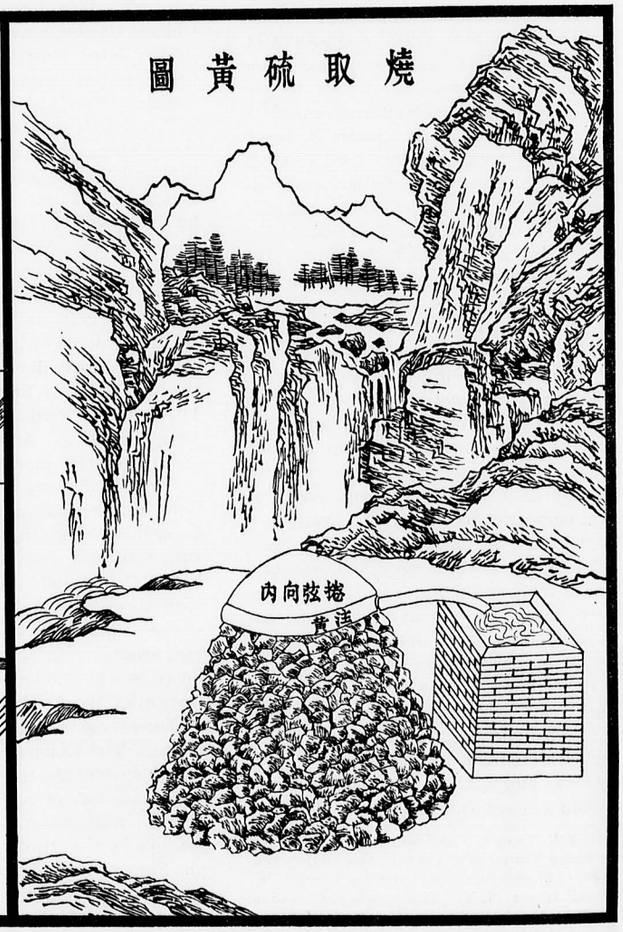
Early Chemical Discoveries

But there were nevertheless some discoveries in China in the realm of chemistry; they were possibly unconscious discoveries, and each was probably the result of a pressing need. I refer to the realm of blind experiment. For example, it is observed that almost all Orientals drink boiled water. We now realize that many areas faced with overwhelming sources of infection find this necessary. Did the Chinese many centuries ago know all about bacterial infection? Probably not. Yet they did hit upon the necessity of drinking boiled water. One way of saying this, of course, would be to state that those who drank unboiled water died off, whereas those who drank boiled water survived.

There are other examples of such blind experiment. In fact, a long list could be prepared. In such a list we would note that mercuric chloride was used as an antiseptic; we would also note the use of the

Distillation of quicksilver

Sublimation of sulfur



ash of sponges as a cure for goiter. We might call attention to the use in north China of mixed cereals involving what the nutritionist terms supplementary proteins of superior nutritive value. We might also note the use of window-covering materials, in particular the use of oiled paper instead of glass. The oiled paper as commonly used proves to be more permeable to ultraviolet light than is glass. Discoveries of this type of course are found in the history of all early peoples.

In reviewing the history of medicine in China one invariably mentions first the early Chinese herbal or materia medica (the Pen Tsao Kang Mu). This book goes back to an ancient sage, Shen Nung, 2800 B.C., the father of Chinese medicine, who corresponds to our own Hippocrates, 450 B.C. The particular revision of this herbal now in use in China was compiled in 1578 A.D. There is much chemistry packed into this book, which includes some 900 vegetable drugs and about 1,000 animal and mineral drugs with 8,000 prescriptions. Among the subjects discussed are: kaolin, chaulmoogra oil, and ephedrin. Much of it is also blind experiment. It furnishes another of the many examples in world history where practice far outran theory till theory was left hundreds of years behind.

Modern Chemistry from the West

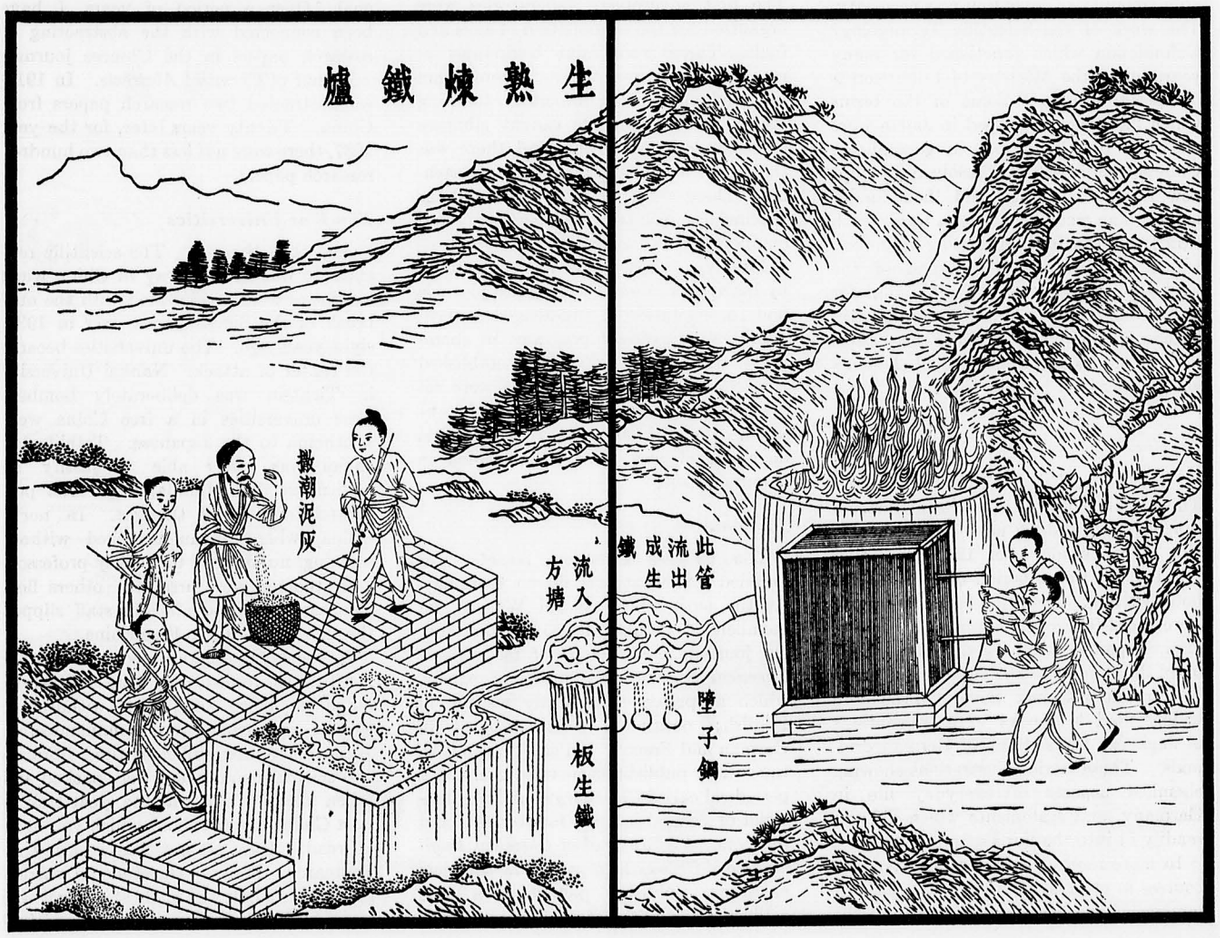
Modern chemistry came to China suddenly. It was not a gradual development. It came about the year 1910 when a new educational system was adopted with the dramatic introduction of science and the scientific method de novo from the Occident. Shortly after, the republic was declared and with this came an eagerness, an open-mindedness, and a spirit of change in the atmosphere. New ideas were welcomed; it seemed as if China were young again. I was fortunate in arriving in China just at this juncture. A young chemistry instructor's fondest dreams could not have produced a more exhilarating set of experiences, this experience of helping to introduce modern chemistry to the Orient.

Problems of Teaching

Our instructions were: teach the scientific method! What China needs, we were told, is the scientific method. But how do you teach the scientific method? And what, after all, is the scientific method? I do not believe we in America bother very much about the scientific method. It is in the atmosphere and we absorb it, which incidentally relieves the teacher of much time and effort.

Our first task was to combat the age-old tendency to memorize. You have heard the oft-repeated story of the class whose examination papers showed identical answers, because the students had memorized the textbook. This is not just an amusing incident, but in the earlier days all too true. This tendency is not so prevalent now as it used to be, but it is still a mental trait and an obstacle with which one must reckon. In my first college class in China, I was distressed to discover that the students made such excellent progress because they were memorizing the text. We decided, therefore, that next term there would be lectures but no text. Next term it was evident that the students were finding it more difficult, then suddenly it became less difficult and we discovered that they were now memorizing the lectures. So next term we decided that there would be no lectures. We built our chemistry courses after that around a program of laboratory projects

Pig iron *Blast furnace*



only. And the pattern for science teaching generally in China has emphasized the laboratory approach, and this approach, with training in the research method, is being emphasized far beyond the emphasis which we give it in this country. The theoretical material can almost be allowed to take care of itself. Training in the research method we believe is the best lever for overthrowing this habit of memorizing and for introducing habits of inductive thinking. It may be of interest to point out that the regulations of the Chinese Ministry of Education provide that every candidate for the bachelor's degree shall submit an experimental thesis as part of the requirement for the degree.

Terminology

The next problem which we faced in the earlier days was the question of terminology. In Europe and America, as our sciences grew and developed, new names and terms were gradually introduced and we absorbed them gradually; it was a gradual evolutionary process. A term was usually adopted when it met the test of experience. In China, however, there was not sufficient time to do this leisurely; a couple of centuries were being compressed into a decade. Therefore, a certain amount—in fact a very considerable amount—of invention was necessary. The work of the Scientific Terminology Commission which functioned for many years under the Ministry of Education is of special interest. Some of the terms which had been developed in Japan were absorbed by China, but in general the Chinese commission was resolved to adopt new terms for China, and their fundamental plan was to fix upon a term which translated the meaning rather than one which transliterated the sound of the western term. It may be noted that for the symbols of the chemical elements, Latin letters are employed. I believe these Latin letter symbols for the chemical elements are international by definition.

Textbooks

Next came the problem of textbooks. The teaching of new subjects of instruction meant a sudden need for textbooks. The first decade after the Revolution (1911–1920) was a period of frantic textbook writing. Many of these first texts were word-for-word translations of German, Japanese, and English textbooks, often ill adapted to the simpler industrial background of China. Several of the more widely used textbooks were translations of Japanese translations of German originals. These carried illustrations showing chemical aspects of everyday life in Germany, and statements which did not readily fit into the Far Eastern picture.

In more recent years, for the advanced courses in chemistry, texts in the English language have been largely used and the need was so urgent that there was often not time to translate them. Moreover, all students in chemistry and the other sciences in China are required now to know and use English as well as Chinese. This use of American textbooks became so widespread that somebody in China found it would be cheaper to print photolith editions in China. There was no copyright law to prevent this. And hereby hangs another long tale. The last Decennial Index of *Chemical Abstracts* (reprint edition) sold in Shanghai for the equivalent of about $30 U. S. currency. The American price was considerably more than that.

Chemistry in all countries seems to have gone through the same three stages of development. There was first an analytical age in which the early chemists frantically analyzed everything—coal, water supplies, and minerals. There was such a period in this country; there was one in China. We were asked to analyze coins, weird food materials, fossils, and impossible drug concoctions. One of my first tasks was to analyze a whole basketful of soybean products, which were then even more of a curiosity than they are now. It seems that every science goes through a descriptive stage such as this.

Second, there was the period of beginnings in pure and applied research. The first government laboratories were organized for the examination of soils and fuels. There were faint beginnings of research in the universities. There began to stand out certain important teaching centers, where students caught glimpses of research in chemistry, and there was the rise of a few outstanding great teachers. There were, however, few buildings specifically devoted to chemistry and equipment was limited.

Finally, a third period was represented by the appearance of the chemical journals and the evolution of full-fledged government and university programs in chemistry research. Industries established research laboratories and funds were set aside for research scholarships and fellowships. Each of these "ages" of chemical development was achieved in China in about a decade.

Journals

The Chinese Chemical Society was founded somewhat over fifteen years ago. At the outbreak of World War II, its membership numbered over a thousand. Its journal, the *Journal of the Chinese Chemical Society*, prints original papers, which at present are mostly written in English; occasional papers appear in German and French. In addition to this, the society publishes a news edition and a periodical called *Chemistry* containing material of general interest for students and teachers. *The Journal of Chemical Engineering of China*, the organ of the chemical engineers, publishes papers of a high caliber. In addition to this most of the research institutes issue a series of science reports or bulletins which include research material in the field of chemistry. At the outbreak of the war about twenty publications in China were on the abstractor's list for *Chemical Abstracts*. During the war, the *Journal of the Chinese Chemical Society* appeared semiannually instead of monthly.

Research Laboratories

The chemical research laboratories in China are worthy of more time and attention than there is space here to give to them. The Chinese Government supports a special group of scientific research institutes—there are about ten of them—known collectively as the Academia Sinica. One of these is devoted to chemistry. There are also chemistry laboratories connected with the different government bureaus, including the Geological Survey, Ministry of Agriculture, Bureau of Standards, and the Central Industrial Research Laboratory. There are about a dozen universities which before the war produced chemistry research work of a high order. These are usually administered as "research institutes" which correspond somewhat to graduate schools in this country.

The growth of research work in the universities in particular has been phenomenal. Over a period of years, I have been connected with the abstracting of research papers in the Chinese journals in behalf of *Chemical Abstracts*. In 1917, we abstracted two research papers from China. Twenty years later, for the year 1937, there were not less than two hundred research papers.

The War Universities

And then the war. The scientific renaissance was in full sway in China when hostilities were precipitated with the outbreak of the Sino-Japanese war in 1937, eight years ago. The universities became the center of attack. Nankai University in Tientsin was deliberately bombed. Free universities in a free China were anathema to the Japanese. Totalitarian Japan was never able to justify an institution that stimulated or even permitted freedom of thought. In north China, where Japan attacked without warning, numbers of university professors and students were arrested; others fled. Thousands of students and staff slipped through the lines into Free China.

As the Japanese armies advanced, other institutions, forewarned, were able to arrange a more organized withdrawal. Trucks and carts were commandeered. When there was sufficient time, libraries and scientific equipment were packed and taken inland. This was the great trek to west China, an epic about which you have all read. They set out like an army on the march. Many of the students walked. Sometimes a halt was made at a city where it was hoped to settle, and where municipal

buildings or old school buildings were made available for class work. But when the zone of military operations came nearer, stakes were pulled up again and the cavalcade moved along, a peripatetic university in fact. The total move, perhaps 2,000 miles, was equivalent, say, to moving Columbia University from New York to Denver, Colo. It forms an intensely dramatic story.

Chinese Chemistry during the War

The following is a list of some of the research projects carried on by the Chinese chemists in Free China during the war:

Gasoline from vegetable oils (motor fuel)
Alcohol from fibrous plants (motor fuel)
Lubricants from vegetable oils
Refractories from China clays
Adsorbents for gas masks
Substitutes for quinine
New sources of vitamins

Research work and instruction in chemistry were carried on during the war with tremendous difficulty. All costs were high. There was inflation. A cup of coffee cost $1,000; a pair of shoes about $75,000. Supply lines with the outer world were practically cut. For a laboratory course in quantitative analysis in one university there were available two burets and one balance for sixty students. Precious stores of research chemicals were almost exhausted. One laboratory wrote, "We count every drop of hydrochloric acid." And all this was accompanied by an overwhelming number of students applying for admission to courses in chemistry and physics.

During the emergency, scientific societies continued to meet. The annual meeting of the Chinese Chemical Society was held last year in Chengtu in a joint meeting with other scientific societies. About three hundred members attended. I dare not attempt to calculate how many hundreds of miles some of them had to travel by coal-burning busses to attend this meeting.

Chinese Compared to Japanese Research

There are certain outstanding qualities in the chemistry research of the last two decades in China, which are particularly outstanding when compared with chemical research in Japan. There are fewer chemists in China, but I believe there is a larger percentage of really brilliant minds among the Chinese chemists. "China's chemistry has aspects of vigor and a degree of originality which, as a whole, has never characterized the chemistry renaissance in Japan. There is in China far less of a willingness to imitate and simply to accumulate routine results.

Future

"The Chinese universities and research institutes are powerful examples of what can be done under difficulties. China is jealous of her cultural heritage, and well she might be. She has had long centuries of long experience in many fields of learning in which we of the Occident are but novices and upstarts. In the use of the scientific method the Occident has much to contribute. In the realm of philosophical thought, poetry, painting, social relationships, and the social graces generally, the Orient has much to teach. When China has mastered the scientific method and when she undertakes to apply it to some of the other problems of humanity, the results are bound to be significant."

Smelting of tin

Manufacture of bamboo papers

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Copies in file of mimeographed letters & Reports

"Now, Where Is My Home?"

By GRACE BOYNTON of Yenching University Faculty

THE SIGHTS and sounds of ancient Chengtu are all about me as I come slowly to an open gate. I pass into a girls' dormitory where I am now to live. I enter a passageway from which rooms open on two sides. The one at the extreme right is mine. It is eight feet by ten and the window has neither glass nor screening. I have requested a lattice which I will back with oiled paper. For furniture I have at present a trunk and a camp cot. I must buy basin, jars, hooks for clothes, locks, a table and a chair. These bare necessities will cost about a thousand dollars of local currency. I consider that I am among the fortunate who can buy even at such a price, and as I contemplate my eight by ten feet of space I feel further my good fortune in having so much privacy.

A rat jumps in at the window and races across the floor. I am glad I am not nervous about rats. I begin to ponder the water supply and wonder how the sixty-odd people who will live with me in the dormitory are to manage about bathing and washing and drinking from one well just outside my window. Presently somewhere in the dormitory a girl begins to sing. It is Jung Chen, singing one of the refugee ballads which are rising from the people in the stricken areas and which the guerrillas are singing as they live on the march:

My home was on the Sung Hua River;
Now, where is my home?

Before my wet eyes come the images of Yenching in Peking; the buildings of stately architecture in the grounds which were once the pleasure gardens of princes; the lake, reflecting the green shadows of the willow trees, the tall mass of the pagoda and the delicate shapes of the marble bridges . . . the halls and the homes where the life of a great institution went on . . . empty now, or desecrated with an evil presence; and the community which lived there, scattered. Some are in danger and all are poor. And I remember all I have been told about that scattering. It comes to me in little bits, like a broken moving-picture film:

December 8, 1941. A winter morning with a high wind playing with the smoke which comes from the tall chimney stack, a sign of warm dormitories, of hot baths and comfortable breakfasts in preparation for the Yenching community which numbers in all over three thousand souls. It is scarcely light, but William Band, physics professor, is preparing for the day. A pounding on his door. It is his neighbor, Michael Lindsay, English tutor in "Modern Greats." I knew and loved his young wife, Hsiao Li, before she was his student and he fell in love with her. "Pearl Harbor has been attacked. I have the news on the radio. The Pacific War has begun. Can we leave in twenty minutes?" Yes, Lindsay, you had good reason for haste. I have heard how you got safe to your 8th Route friends; how 300 Japanese soldiers were sent in search of you; how you had to march long stretches without rest, Hsiao Li standing the test with gaiety and hardihood, and doing as well as you men. So, you and the Bands are safe, not far from Wu T'ai Shan, where you and your radio lore are very useful!

The reel shifts back from hill marches by night to the campus morning scene—still December 8. Breakfast and first-hour classes. The armed Japanese entering the Alumni Gate. A student mass meeting is called. Orders to go to dormitory rooms and await further instructions are barked out. The academic buildings are sealed; no returning to them for personal property. The Bank has been seized; no funds are available. Margaret Speer organizes her women teachers to maintain quiet and give whatever counsel and comfort can be managed for her girls. That night students and seven members of the faculty are arrested and taken away. That night the lake is frozen and hearts freeze with it.

December 9—the next morning—all students are ordered to leave the campus. No conveyances provided, and no help with luggage permitted. They can take away what they can carry. Over a thousand young people turned out to shift for themselves. Utter confusion. Some roll their bedding bundles over the ground; some are dragging trunks and heavy bags. Gate inspection. Each "inspector" appropriates anything which takes his fancy! And now I see the refugees on the road—twelve winter miles to Peking and night coming on. Within the city, every hotel and every private house reluctant to shelter Yenching students for fear of Japanese malice. Certain homes are open to them in spite of everything, but some spent that first night on the street or under a public gate. But one comfort—there had been wise foresight. Money had been laid up outside of the bank and had been rapidly distributed to those who were caught without funds. No one, I have heard, left the Yenching gates that day without a little provision for his immediate needs. But even so, the days that follow are dark and bitter and full of uncertainties for the young refugees. Police inquiry pursues them; they must register in degraded puppet institutions; they must not be found together, nor is it safe to attempt the escape to free soil. In the early days some few did leave.

Yenching empty and still. Now the horror of faculty arrests. Our finest go into Japanese prisons. They sleep on the floor. They are chained two by two and marched out to empty and clean the crude toilet buckets. They are fed very little and threatened very much. I have been told of one beating. All are required to write a "letter of repentance"—for their patriotism! No one does. One writes a long and brilliant analysis of Sino-Japanese relations and points out the misdeeds of Japan; another writes, "Nothing to

regret." The spirit burns bright but the flesh is weak. There are serious illnesses. One nearly dies of typhus. One has tuberculosis. One is wasted by dysentery. We Yenching folk in Free Territory hold our heads high over the record of our scholar heroes.

I recall how I asked an early student arrival here about one whose health has never been vigorous but who is perhaps the outstanding Christian thinker in China today—T. C. Chao, the beloved dean of the Yenching School of Religion. I thought the prison experience might break him physically. But my informant looked a little surprised at the suggestion.

"Dr. Chao is very peaceful," she said. "He is writing poetry."

And I remembered Paul the Apostle and John Bunyan the preacher and wondered if another Christian classic may not come to us out of this Japanese jail.

. . . "Now, where is my home?" Jung Chen was still singing the refugee lament. The Japanese abolished Yenching, or so they thought; at the time when the students were being turned out they used their moving-picture cameras and a reel was exhibited in all the theaters of occupied China and presumably of Japan, showing the end. With angry tears Yenching graduates saw the picture in Shanghai. The Chinese members of the staff who were left at liberty were allowed to draw one month's salary, but soon found it impossible to stay in their homes. They had to scatter to avoid suspicion. The support of their families became a desperate matter. The western staff was first shut up in the South Compound, and then moved into Embassy quarters in Peking. "Now where is my home?" The Yenching campus was given over to various uses. Japanese soldiers clumped in and out of the girls' dormitories. The academic buildings were turned over to a puppet "research institute" after futile efforts had been made to get the Chinese members of the University to use Yenching's name, and prostitute our freedom and truth under the New Order.

Yenching's proudly obstinate record was finished, our enemies thought. But they were wrong. I rose and brought out a certain stout and shabby notebook where I had another chapter of Yenching history.

January 11, 1942. Last Sunday we had a meeting of a few Yenching people, and decided to invite Yenching here. Telegrams have been flying about from alumni in free China: each group demands the reopening of the "mother school" and each claims her for its own locality. When I expressed amazement at their eagerness to assume the burden of sponsoring a refugee university, I was told that ever since the word of Yenching's closing came, alumni have been calling themselves "orphans."

April 27. Four of our students are actually here. There was one more in this group who, when he reached Loyang and heard that we are planning to reopen, asked to be sent back to Peking to carry the news to others there. That brave fellow will be along later if he successfully negotiates two crossings of the Japanese lines.

I went to a general alumni meeting which began at 1:00 and lasted until 7:00! One of the newly arrived men spoke under such emotional strain that it was very hard to follow what he said. His recital was harrowing. He described the arrests; he described the torture of one of our people.

July 19. Dr. Mei has been named acting president and seems an excellent choice. When he arrived, having traveled by truck, he looked like a dock laborer in his grime and sweat, and shabby wayfaring clothes. Truck travel allows no comfort, no safety, no cleanliness, no dignity. But when he had had his bath and changed into a long robe of heavy white silk he was transformed into the perfect Chinese scholar-gentleman. I handed him a fan to make the picture complete, but he has acquired a Western scorn of fans.

July 23. Some school property belonging to the Methodist Mission and vacated on account of the bombing has been found in the city. In the meantime, Yenching is holding summer classes for our students who have lost so much time.

August 5. The rooms in the buildings we have arranged to rent are still full of tenants who have edged themselves in without formalities, but Dr. Mei is courteously but very briskly moving Yenching workmen and students in on top of them.

He showed us the girls' dormitory where I am to live and I confess that at first glimpse my unheroic spirit has quailed within me. . . . At this point I stopped reading the stout old leatherbound book. Quailing or not, here I was, and here I was glad to be. A faint square of light filled an open doorway down the corridor, and I went down and looked in. The only furniture in that room was a double-decker bed, but two suitcases were piled one on the other to make a table and Jung Chen was kneeling before it working with her writing brush on a long strip of red paper.

"You were singing 'Sung Hwa River,' weren't you?" I asked.

She looked up from her work. "Yes. It made me think of doing this."

She held up the long strip of red with characters traced in bold wet black lines. I read a University "slogan" familiar enough in the past: *Yen Ta I Chia—The University is one family.*

"I shall post it up in the hall," said Jung Chen, "for all the new students to see."

Two more entries finish the account begun in my recollections of the August evening in the dormitory.

September 6. Yenching gave entrance examinations in both Chengtu and Chungking and nearly three thousand students registered for them. The handling of such numbers was a formidable job, and we never could have opened the University at all if it had not been for the students who arrived from the North. Out of the mass of applicants we admitted 230.

December 8, 1942. One year ago today the Japanese closed the gates of Yenching in Peking. Today we have had the formal reopening of Yenching in Chengtu. It had been a long day of ceremonies and congratulations, and I have just left the tea-room where a large group of our graduates has settled down for a good gossip over the how and why and wherefore of everything. On the entrance to the dormitory I see a long strip of paper with the slogan, "A thousand times remember those still suffering in the North."

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Dear Friends:

This report from Dean T. C. Chao is herewith sent to a selected list of faculty friends who are thought of as being especially interested. Additional copies can be secured from this office.

The following paragraphs are quoted from his personal letter under date of November 25:

"I hope this reaches you before Christmas. This brings you and all our Yenching friends, especially those of the School of Religion, our best wishes for a Merry Christmas and a happy New Year. I speak also for Wu Sheng Te and Leatrice Huang."

"Herewith a statement of the work we are doing here in Kunming in the name of of our Lord Jesus Christ. It explains itself."

"We had a very fine welcome and farewell meeting yesterday afternoon—to welcome Wu Sheng Te and Leatrice Huang and to say goodbye to Gilbert Baker who is going to India for a short vacation, about three months. The spirit of the meeting was very fine. For the last two Sundays the church was literally full. More people came than we could accommodate. My message is going across now. It has taken me four months persistent working to win confidence. The battle is now partially won.

"People were anxious about air-raids. Otherwise our big family at 68 P'ing Cheng Chieh is a jolly group. We have family prayers and singing."

"I have invitations to speak in several centers and next year I hope to fly to Chengtu for a month's lecturing and preaching. Travels will be paid by the institutions that invite me."

December 15, 1939 J. L. S.

REPORT OF RELIGIOUS WORK IN KUNMING

T. C. CHAO

To those who are interested in the religious work we are doing here in Kunming among students, greetings and best wishes for a Merry Christmas and a happy New Year. We are a Yenching group working in cooperation with the Chung Hua Sheng Kung Hui.

I arrived in Kunming on July 19th, with Mrs. Chao and a servant and many student friends. When we arrived, my son-in-law had already secured a nice and spacious house for us, which we at once rented, for 1939-40, to quarter my family, my son-in-law's family, and my Chinese colleagues in our religious enterprise. The rent, $200. a month. is paid by three parties: Yenching pays one-half of this sum ; the Sheng Kung Hui, whose guests we are, pays $ 60 a month ; while the Chens take care of the rest for the portion of the house which they occupy. As labor was costly, we cleaned the house ourselves, with the help of five college students and an old man who cleared out the overgrown yard and washed some of the windows and doors. Since the occupation of the house, we have been struggling with flies, mosquitoes, bed-bugs that fall from the ceiling, rats that are noisy and numerous, and fleas that cause diseases. We have succeeded in the conquest of these small but rather formidable enemies of mankind.

The Bishop of Hong Kong and I agreed to carry on our religious enterprise among the students of Kunming for a year. He says in a written statement, "Dr. T. C. Chao is, from his arrival, minister in charge of the special church of the Sheng Kung Hui, in Kunming, which is being started for students and professional youth. He has complete discretion to use any forms of worship he may wish to use, including the celebration of the Communion". His enthusiasm and trust has called forth a pledge of loyalty on my part, to the Sheng Kung Hui. Although I met but an indifferent welcome here, I have thrown myself and my resources into the work without reserve. God is gracious and has taught me to expect the unexpected. The work is His and not mine.

Our church, now called Wen Lin Tang, or the Hall of the Forest of Learning, is situated on Wen Lin Street near the Great West Gate and in the vicinity of the South Western Associated University, called Lien Ta in short. The building is modestly modelled from a very old house and has a

seating capacity for about 80 people. Next to the church is a shop-front containing one small room, adapted to be used as a reading and waiting room from which a small entrance leads into the place of worship, the Wen Lin Tang proper. Another small room, with sufficient space for a bed and a table, flanks the church on the other side. This room is now occupied by Mr. Li Feng Ch'u, a Shanghai lawyer and a member of the Sheng Kung Hui, who has been given a fellowship out of the Yenching fund at my disposal and who came from Chungking to study the Christian religion with us. These three rooms are utterly inadequate for our purposes, but under the circumstances we have to be content with what is possible. We need a quiet room very badly for heart-to-heart interviews and private prayers. We need also rooms for Bible classes, discussion groups, and social gatherings.

Mr. Gilbert Baker, a graduate of Christ Church College, Oxford, was sent to Kunming several months ahead of me. Through his efforts, the Wen Lin Tang was rented, remodelled, and arranged for worship and other religious purposes. He serves not only as a link between our work and the St. John's Church, (which is also a church of the Chung Hua Sheng Kung Hui) but being an Anglican priest, also is a living embodiment of the Sheng Kung Hui tradition. His cooperation has made my work easy and smooth. At present he is trying very hard to buy the site on which the Wen Lin Tang is situated, together with the shop-fronts and houses attached to the site.

Since coming here I attended two student conferences in which I led morning prayers, Bible classes, and discussion groups ; gave platform addresses; and held personal interviews. I have been preaching continuously, at least once every Sunday. By a few, I was thought to be somewhat abstract and philosophical. I do not take such remarks seriously inasmuch as I am doing my best to be practical, concrete, and direct, as well as intellectual, and trying to set a standard for a real University Church. I earnestly desire to create, by the help of God, a desire for truth, and to offer a reasonable interpretation of the Christian faith, not untouched by a warmth of emotion, nor unconnected with the vital problems of the day. My understanding is that a preacher has to create a taste in the hearers for his message and for his way of presenting it. People have to learn to like American tomatoes, Swiss Cheese, or Chinese bean curd, and not to require these to be transformed into sea cucumbers, shark's fin, or Cantonese rats and snakes ! I follow Bishop Hall's instruction that I should be a teacher and preacher and not an organizer. He says : "My own view is that it is most important that he (Chao) should as a rule, preach himself".

There is still uneasiness on the part of some who are themselves not theological thinkers, in regard to the soundness of my theological views. I am inclined to confess that my desire to be scientific in the search for truth and my yearning for real Christian piety give me a tension within, which seems to

become a permanent necessity, and at the same time give to others an apprehension about my views, which really does not need to become the same kind of necessity. I am also inclined to say that I am radically liberal and radically conservative at the same time.

My mornings are spent in studying and writing. During the last four months I have written a course of studies in the Life and Teachings of Jesus, an article on My Faith in This New Age, and about sixty pieces in verses. Lack of reference books and special religious books, together with the absence of theoretical stimulation, make literary work exceedingly difficult. My afternoons are often occupied with visits of friends, personal interviews, study or discussion groups. Mr. Li Feng Ch'u is studying Christian theology with me and takes a goodly portion of my time.

My stay in Kunming thus far has led me to understand a little more about the doctrine of the total depravity of man, to see why it is almost impossible for men by their own efforts to reach God, and to perceive that selfishness lurks even in the best of intentions.

I have been here already a third of the precious year. Each of the four months spent gave me some valuable experience. The first month was spent in blissful ignorance, in setting up a house, in buying, cleaning, etc., and in attending student conferences. The second was a month of writing and quiet working. During the third month I was deeply disturbed and felt very sad at heart, seeing the terrible chastisement of God upon a Godless world and awaiting without any assurance beyond an unreasonable thought, the coming of Mr. Wu Sheng Te and Miss Leatrice Huang to be my co-workers. As usual, under such circumstances, I took to my two *P's*—prayer and poetry. In the process of my inner disturbances I felt that my prayers would be answered. I was also troubled over the leaping increase in the cost of living. At one time the price of rice rose to $70 a picul. One met with callous carelessness and starving anxiety face to face everywhere. One discerned more clearly than ever the shortcomings of what we call university education. I could not but feel that my message was not getting across.

During the fourth month, difficulties arose in my own family. My second son and a friend of his were robbed by a highway man. Later on he got suddenly ill, was sent to a hospital, and after three days there became suddenly well, with all his high fever gone. After this peculiar alarm, Mrs. Chao fell severely ill, with vomiting, high fever, and headache, suffering from a thing called ricketcia, due to the bites of fleas. She ate nothing for two weeks. To know what sickness means in Kunming today is to gain some experience. I became nurse, servant, cook, and the lord of the house all at once. I swept the grounds, mopped floors, fanned the charcoal stoves, ran after doctors, hunted for the precious drugs, prescribed by the doctor, that came from various drug stores,

bought what there was to be secured at sky-high prices, and administered the stuff to the sick person. One injection of omnadin cost $8 while some two years ago the same thing cost only seventy cents to a dollar. Just at this time, T. Z. Koo came for week. Naturally I could see him only for ten minutes!

I brought a man-servant along from the North. The simple-minded fellow began to get wise. We allowed him to satisfy his gregarious instinct by contact with servants of other homes. These people, strangers themselves in this place, led our man to think that he could receive a great deal more in other houses. He packed up to leave at once, in spite of the fact that we had paid for him his travels and gave his family half year's wages in advance. He had not the slightest sense of responsibility and was entirely oblivious to our special kindness to him and our constant considerateness. I must confess that it was real discipline for me to take him as he was, to suppress all my pride, resentment, and anger, to reason with him quietly, and to bring him to his senses. Of course he knew it was next to impossible for us to get a native servant that would fit in with our purpose and that the law was too busy to pay attention to our difficulties. I increased his wages by a leap of $5. This change did not last long. Soon I had to reason with him again. He was touched and promised to give me no further trouble. He now seems to understand that we are mutual servants and that since we are to show the Christian way of living to people, he serves me and does what I cannot do in order that I may serve others, and I in turn serve him and do what he cannot do in order that he too in an indirect way may serve the same people. In fact we are called by God to do the same job. Of the two, my servant and I, I am the more sophisticated and less simple-minded fellow, and so perhaps it is more difficult for me to learn the lesson of genuine service.

On October 1, I learned that Wu Sheng Te had arrived in Kueiyang with his wife, a babe of fifteen months and two sons, after having gone through all sorts of thrilling adventures. They had a good deal of sickness on the way. Early in August, Bishop Hall sent him $200.00 Hong-Kong money for travel. He started from Fukien with his family on August 7th. On September 20th they arrived in Kuei-Yang, completely penniless, after forty-four days of dangerous travelling and after going through seven provinces,—Fukien, Kiangsi, Kuangtung, Hunan, Kuangsi, and Kueichou. Material reenforcement was immediately sent to him. And imagine the joy when we met in Kunming at 68 P'ing Cheng Chieh on the evening of October 15th. If the word "guts" means anything, it is found in the life of Wu Sheng Te, a man who could have become rich by being a merchant in the Philippine Islands, but who chooses to receive a negligible salary hardly enough to cover the expenses for food for himself and his family, in order that he may spread the good news in his own country. Wu is a silent man and in silence he does his part.

Rejoice with me, for Leatrice Huang has also arrived. She came a week ago, after having visited her parents and relatives in Honolulu, attended the

Moral Rearmament Conference in Hollywood, California, and worked for over a month in "life changing activities" in Shanghai. Her experience on teams of the Oxford Group Movement has fitted her remarkably for the work among students in Kunming. Before her coming, she had raised her own salary for 1939-40 in Honolulu with the sympathetic help of Dr. Theodore Richards.

Our group is now complete: Mr. Gilbert Baker, B.A., Christ Church College, Oxford; Mr. Wu Sheng Te, B.A., St. John's University, Shanghai, and B.D., School of Religion, Yenching University; Miss Leatrice Huang, B.A. and M. A., Yenching University, and I myself, now minister in charge of Wen Lin Tang which is becoming a University Church for teachers and students of non-Christian universities.

On November 21, this group of religious workers held a whole day conference to face together in a general way all the problems that confront it. Bishop Hall's agreement with me was reaffirmed. I stated the guiding principles of our work as follows:

1. The work is to be church centred.
2. Each member of our group has absolute freedom to do his or her best in the promotion of the common task.
3. Transparent cooperation, all cards on the table, and thorough frankness in mutual criticism and advice.
4. Intensive and quiet work.
5. Careful and analytical study of situations, in order to meet real and vital needs.
6. Expectation of the unexpected.
7. Interest in all human things and see them in the light of God's purpose.
8. Building of a real University church.

Baker and I reported the work thus far and reevaluated it. We found that while Wen Lin Tang has not yet become a full-fledged church, its worship on Sundays has been well attended. Over forty Lien Ta students have organised the Lien Ta Christian Fellowship which is now divided into five smaller fellowships, all under able and conscientious student leadership, carrying on religious and social activities. An enthusiastic choir has emerged which will improve the music of our church services and religious meetings. Bible classes and study groups have gone on. I have given a course of four lectures on "Christianity and the Chinese Race". On every Wednesday evening, I hold a question hour, during which all sorts of problems are aired by those students that come and replies are made. I have tried to offer a corrective to many

wrong conceptions in regard the Christian Faith, and at the same time to stimulate interest in religious inquiries. Recently this hour has been concluded with a period of prayer. Morning prayers have also been started so that students who are unable to have morning devotions in their crowded dormitories may use our place in the beginning of the day to prepare themselves for the duties that lie ahead of them. On every Monday evening, a group, a growing group, of professional people including University professors, medical doctors, research students, and intellectual ladies, some of whom are returned students and all of whom are college graduates, come together for a meal at my home, for a period of worship, and for discussion on some important subject. Last time we had nine people to dinner, besides ourselves, and discussed the subject: "The Psychology of the College Students in Kunming. "Mr. Wu Sheng Te presented the results of his own study very ably and a lively conversation took place. In addition to these activities, as students are beginning to make spontaneous visits to our house (68 P'ing Cheng Chieh) we now have more frequent personal interviews. Personally I wish I had studied psychology, mental hygiene, social philosophy, and modern world history before I entered into the present temporary ministry.

We are keenly conscious of our short-comings and of the difficulties that confront us. The religious approach, while fundamental, is only one of the approaches to modern problems with which youth is afflicted. Life is a connected whole, a network of complicated relations. If other problems are not being solved, the religious solution has to go on with unimaginable difficulties. Humanly speaking, there is no big harvest in sight. Let one illustration suffice. We say we are going to have a happy excursion. The poorer students will have to think over the matter several times before they will go with us. They have questions of the cost of an humble picnic, of wasting a bit more of their already tarnished bodies and broken shoes on long walks along rough roads, of matching their appearance with that of those who are more favorably situated than they are, and of a number of unsuspected details. People with persistent problems to face always have narrow interests. There is a lack of moral guidance in education that is appalling. Then a cursory survey of the bookstores should make the evangelist, the theologian, and the religious worker truly sober. The question is: "Whither China's college students?"

There are, however, enough bright spots here to give one courage and optimism. We are now in contact with many of the best among college youths. Some of these are Christians who are really interested in the activities of the church. We are here to create new desires for straight religious living, to give incentive to new and creative initiative in faith and in constructive service. Baker and I are now trying to get some of them to become definite members of the church, thus to develop a real sense of proprietorship in the body of which Christ is the head, and to arouse a deep feeling for the church as their spiritual

mother and home, as well as the centre from which they can issue forth empowered to live the righteous life in the non-Christian environment and to make right changes in it.

In the whole day conference on November 21, we also discussed our message and special emphasis needed in our time. According to Baker, our message is the Word Incarnate, God in human life and history. Among other things, he lays stress on the importance of making Christianity intellectually respectable, We must show the relation of Christian living to the vital issues of the day; we must keep the young people in touch with the World Student Christian Federation; we must make clear the meaning and importance of the church; and we must present the need and the way of studying the Bible. Mr. Wu Sheng Te urged the importance of conversion. Miss Huang says that Christ is the drastic and permanent solution of personal and social problems. I am in full agreement with all these statements that we made to each other in our group. My own message is the traditional one, salvation through faith in Christ and identification with Him in obedience to God. I place special emphasis on the urgent need of creating a creative initiative in the young, of kindling in them a burning passion for freedom both from external and internal bondage, and of firing the desire to love men and to live in obedience to the holy will of God.

Each one of our group makes up his or her own plan of work. Baker is the Sheng Kung Hui itself, carrying on its tradition and all the duties therewith connected, including the celebration of the Holy Communion. It has been agreed among ourselves that during his absence, I shall conduct Communion service as a non-conformist, not as an Anglican. This suits me very well. We follow what I have called the Madras Conference principle of two kinds of the Communion service. Wu Sheng Te wants to do more work in personal evangelism, to go about discovering the real needs and problems of students, to preach only a few times. In addition to these activities, he is to be in charge of the business side of our work since he is an experienced man in such things. He will carry Baker's administrative duties during Baker's vacation that will soon begin. Wu is a determined man, right wing in theological thought and somewhat left in social ideas. Leatrice Huang has planned her work on three lines: personal work among students especially girls, among teachers and community people; discussion groups dealing with industrial cooperatives, mental hygiene, etc; and social service through the organization of Sunday school work, the conduct of a school for poor children, vacation projects, and other forms of expressional activities.

There is now being organized a group of University professors, with myself as one of the initiators, to study and discuss problems in practical moral living, in philosophy, art, literature, and religion. It is a small group, most of whom are non-Christians. Meetings will be held in Wen Lin Tang. Papers

will be presented by members of this group and discussions will be conducted in the presence of a small number of selected friends among college students and professors from the various institutions of higher learning in Kunming. The purpose of these activities is both theoretical and practical.

Our work is now growing quietly on every hand, in spite of very real handicaps and difficulties. Since we work with students who attend classes in day time, we have to make use of the evenings. So with the exception of Saturday, every evening of the week is now occupied with more or less intensive and interesting religious and social activities.

Last night, November 24th, Baker had the group to dinner at his lodging and gave us a square meal which all of us enjoyed. After it, as previously arranged, each told his or her own life up to to the present time. Four very revealing and thrilling autobiographies were presented with only the autobiographers themselves listening to them. We had unprecedented fellowship. A gathering of this kind would not be possible had not the love of Christ urged us on to it.

I cannot write a longer letter or send frequent information to you. The lack of clerical assistance accounts for this short-coming on my part. Your interest and prayers will help us greatly. May the rich blessings of God be with you always.

November 25, 1939
68 P'ing Cheng Chieh
Kunming, Yunnan

A CHINESE PHILOSOPHER'S THEORY OF KNOWLEDGE

by

CHANG TUNG-SUN 張東蓀

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A Chinese Philosopher's Theory of Knowledge *

I

In this essay an attempt will be made to deal with theoretical knowledge in a more or less comprehensive way. It is an attempt at a theory of knowledge. For quite a number of years, the writer has had in mind the idea of elaborating more satisfactorily a hint given him in the discovery that Western philosophical problems are not exactly similar to those which were in the minds of Chinese philosophers. There seems to be some difference between the Western and the Chinese intellectual processes. With this in mind, it is desirable to have our view of the Western theory of knowledge somewhat clarified. For the Western theory of knowledge has taken knowledge as the *universal* knowledge of mankind. As a matter of fact, however, it is only one kind of knowledge, other kinds being present in other cultures. Support for the view that knowledge can be studied sociologically or culturally came recently in Karl Mannheim's *Ideology and Utopia: An Introduction to the Sociology of Knowledge.* Nevertheless, there are points of difference between Mannheim and the present writer.

The sociology of knowledge, historically, has merged with Marxism. But the Marxian interpretation of society is different from the point of view to be elaborated here in that it laid its emphasis on the antagonism of economic classes. Its sociology of knowledge is, therefore, characterized by class interests. In

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* This article is a translation, by Mr. Li An-che, of Professor Chang Tung-sun's original paper in Chinese which appeared in the *Sociological World*, v. 10, June, 1938, under the title — "Thought, Language and Culture."

other words, it is nothing but an attempt to give knowledge its background in class struggles. This theory of knowledge cannot be properly called a sociological theory of knowledge but rather a class interpretation of knowledge. It is evident that the influence of social relations upon thought will not be adequately accounted for merely in terms of economic interests. Mannheim's merit lies in the fact that he has transcended this limit. Still there is much to be desired in his work, because it has been entirely in the field of concrete thought, or the prevalent thought of a given time, such as particular "isms" and theories. It is legitimate, of course, to analyze the social relations underlying such thought, but we must realize that in concrete social thought, there are also categories employed, and these categories themselves can also be analyzed from the sociological point of view. The attempt of this essay is primarily concerned with the latter, that is, the categories used in social thought. In other words, our interest here lies more in the structures underlying thought than in concrete thought as such.

By the nature of the problem our approach should be similar to that of Kant. The Kantian type of interest in knowledge is concerned with the fundamental conditions of knowledge, and to this extent the Kantian theory of knowledge seems to be acceptable, for a theory of knowledge should be a study of the forms of knowledge without touching upon its contents. But a sociological theory of knowledge will inevitably go beyond Kant, for Kant himself thought that he was treating the universal categories employed in the thinking process of all mankind, while as a matter of fact he has treated the forms of thought characteristic only of Western culture. Yet it is not to be taken to mean that it is not possible to have universal categories applying to human thought in general, or that only ethnically and culturally determined forms of thought are possible. Universal categories for human thought may be recognized, but not those defined by Kant. The Kantian theory of knowledge is within the limits of the Western type of knowledge; he attempted to establish a foundation

for the great tradition of the West. He himself, of course, was influenced by his time and the culture of the Western tradition. He attempted to use the problem of knowledge to make a new approach to metaphysics in order to revive it. In his view, should he succeed in establishing the non-empirical aspect of human *understanding*, his metaphysics, as a prelude to the philosophy of life, would be on solid ground. Our problem today does not seem to be parallel with his.

We are in need of a theory of knowledge, but its use is not for the support of metaphysics. Our attitude, therefore, is different from that of Kant. It is nearer to that of Spengler.[1] Following the latter, we may attribute the genesis and differences of the categories of thought to cultural differences. A given culture must have a given set of categories. This does not mean that a given culture is derived from a given set of categories, or that a given set of categories gives birth to a given culture. It means that the establishment of culture and categories is one and the same thing. The formation of a given culture lies in the use of a given set of categories, but the relation between them is not in terms of cause and effect. They are two aspects of the same entity.

Being a philosopher and not a student of cultural anthropology or any other social science, the writer's treatment of knowledge from the cultural point of view may not necessarily be in agreement with that of the cultural and social scientists. The point of view expounded here arises from the findings of the history of philosophy. It is for the social scientist to revise or modify this contribution if necessary.

To recapitulate thus far: firstly, a theory of knowledge and cultural history must be treated simultaneously; secondly, not only does concrete social thought have its social background but logical forms and theoretical categories also have their cultural determinants; thirdly, the difference between Western and

[1] Oswald Spengler, *The Decline of the West*, London, 1926-1928, 2 v.

Eastern thought can be explained from this point of view; fourthly, from this we may understand that Western philosophy is nothing but a particular form of knowledge characteristic of and for the use of Western culture. All these points will be further elaborated in the following pages in which an attempt will be made to establish a new theory of knowledge.

II

Before proceeding further, it is well to distinguish the various types of knowledge. Generally speaking, there are two kinds of knowledge, the perceptual and the conceptual. Take a table or a chair for instance. It can be touched and perceived directly. This is perceptual knowledge. The uniformity of nature and the idea of a Supreme Being, on the other hand, cannot be verified by the senses, and causality, teleology and the like are also conceptual in nature. It may be noted that perceptual knowledge cannot be outside the conceptual, nor can conceptual knowledge be separated from the perceptual. As a matter of fact, any conceptual knowledge contains perceptual elements and vice versa. The differentiation between the two is always for the mere convenience of discussion. They do not exist separately.

The kind of knowledge treated in this essay, it will be seen, is not perceptual but conceptual knowledge. In so far as the conceptual guides the perceptual, the importance of the former surpasses that of the latter. This point is often neglected by the empiricists, but from the standpoint of cultural history it is desirable to have it emphasized.

Conceptual knowledge is also interpretative in nature. By interpretation we understand the manipulation of concepts and the employment of categories. For instance the apprehension of a flower is a perception, but it is an interpretation to say that flowers are derived from leaves, or that the formation of the flower is for the purpose of reproduction. In an interpretation

of this kind, at least, the following concepts are being used: any event must have its antecedent; each change must have its cause; and, the final result in a concept of evolution is so much the more derived from interpretation. Therefore, interpretative knowledge, because it contains concepts and results in concepts, is conceptual knowledge. The manipulation of concepts is for the purpose of interpreting perceived facts. Thus, it is evident that conceptual knowledge is interpretative knowledge, and interpretative knowledge is theoretical knowledge.

At this point we may mention the thesis of Pareto,[2] the Italian sociologist, for purposes of comparison. According to him, theoretical knowledge has very mixed elements: descriptive elements, axiomatic elements, concrete elements and imaginary elements, in addition to those appealing to sentiments and beliefs. He also classifies theoretical knowledge into two kinds: the experimental and the non-experimental. And, with these two as *matter* he has as *nexus* the logical and the non-logical. Thus there are four classes, the logico-experimental, the non-logico-experimental, the logico-non-experimental and the non-logico-non-experimental. In this connection we are not interested in developing his theory, but merely in pointing out that his experimental knowledge is outside the theoretical knowledge discussed herewith.

His distinction between the logical and the non-logical indicates that the non-logical is not very important, but the term "the logical", itself seems very ambiguous. The thought of man may not necessarily be in agreement with formal logic, but it cannot be otherwise than in agreement with *a* logic. We are treating, therefore, not formal logic but real logic.[3] The type of logic used by Chinese philosophers is different from that of the West, while the Hindus may have a logic different from both

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2 Vilfredo Pareto, *The Mind and Society*, tr. Andrew Bongiorno and Arthur Livingston, New York, 1935, v. 1, p. 8ff.

3 Formal logic as a matter of fact is influenced by real logic; this will be further elaborated later.

the Chinese and the Western. Logic follows the trend of culture. Western scholars often mistake their logic for the universal logic of mankind, as we have seen in the case of Kant. We will have more to say on this point later. It suffices here to say that the distinction between the logical and the non-logical is of no particular importance, because there is no theoretical knowledge which does not imply real logic. It sounds like nonsense to speak of non-logical theoretical knowledge. Pareto has made a real point in saying that approval and disapproval of non-experimental knowledge depends upon sentiment, and thereby speaks of the "logic of sentiment". But from the logic of sentiment we must exclude experimental knowledge before we can go any further. What we are interested in here is a kind of knowledge which is both interpretative and conceptual and outside the experimental.

The newly arisen Vienna school has noted this point. Carnap, for example, has made a distinction between the problems of facts and the problems of logic.[4] The former are those arising from facts while the latter are problems of words symbolizing things, and of the judgments which are made about things. This distinction may be of use by bringing before us the fact that much of our knowledge is not directly related to things, but merely to views about things. This kind of knowledge has a great place in human life. In our discussion we are dealing with this kind of knowledge which in concrete cases is comprised of political thought, social thought, philosophical thought and moral points of view, as well as the theoretical part of religious beliefs. Scientific knowledge, apart from its experimental elements, belongs here also in the form of interpretative theory.

It is worthwhile to note that experimental knowledge is guided by conceptual knowledge. Whitehead is very clear on this point.[5] According to him, science is a synthesis of two kinds of knowledge, one direct observation, the other interpretation. Thus he

[4] Rudolf Carnap, *The Logical Syntax of Language*, London, 1937, p. 277.

[5] Alfred North Whitehead, *Adventures of Ideas*, New York, 1933, ch. 9.

speaks of "observational order" and "conceptual order." The former is explained as well as supplemented by the latter. Points of view among scholars may differ as to the priority of the two, but since the emergence of higher animal forms, both of them have co-existed. New observations may modify original concepts while new concepts may lead to new points of observation. We may take the evolution of physics as an example. Newtonian physics starts with matter in the form of concrete things. Hence the conceptions of absolute motion, and absolute space and time. But modern physics takes cognizance of concrete matter only as a point in the framework of time and space. Hence, what Whitehead calls "simple location" is discarded. From this it may be seen that the development of physics follows the conceptual scheme which is employed in it. In addition to Whitehead, V. F. Lenzen, the American physicist, in his *The Nature of Physical Theory* has illustrated the changes and developments of physical concepts in relation to physics. In the field of biology, Woodger in his recent book, *The Axiomatic Method in Biology*, has also demonstrated very clearly that categories have guided observation. All these examples show that experimental knowledge is perceptually derived knowledge which is guided and influenced by underlying non-experimental knowledge or conceptual knowledge. It is easy to see that experimental knowledge can modify conceptual knowledge, while it is not so obvious to many people that conceptual knowledge may be underlying and guiding the perceptual knowledge.

Another point to be made concerns the social nature of conceptual knowledge. All experimental knowledge is derived from the senses, and thus is individual and private, in other words, non-social. Consequently, perceptual knowledge can hardly be social knowledge. Yet no knowledge can do away with its social content, the emergence and existence of which occurs only in the field of interpretative knowledge. S. Alexander[6] has pointed out that the problem of valuation has a social nature, and that without pre-

[6] Samuel Alexander, *Space, Time and Deity*, London, 1920.

supposing society we cannot speak of value. It is needless to say that valuation is possible only in the field of interpretative knowledge. So far as perceptual knowledge is concerned, by the nature of the fact that it is private and individual, there is no problem of objective valuation. The importance of perceptual knowledge is self-evident, while non-experimental knowledge is apparently unimportant because its importance is not so evident, though nevertheless real.

III

The reason for the social nature of theoretical knowledge is not far to seek, it is that it is thinking expressed in terms of language, which in scientific terminology is called "linguistic thinking". It is needless to say that language is a social product. Although the child's language has a stage of monologue, it is self-evident that language implies or presupposes an audience. Primitive man, we are told, often takes language as a concrete entity. The lower the culture, the greater the power of words. In primitive society language has magical power, therefore there is a direct connection between language and thought. If a primitive man is accused of being a thief, he most certainly becomes angry. But in modern society a sophisticated person can turn aside this accusation by a smile, provided he is innocent. We may take the degree of the power of words as a gauge to measure the development of an ethnic intellectual development. This point has been sufficiently demonstrated by modern students of child psychology and "primitive mentality", so we do not need to dwell upon it any further.

The arguments thus far seem to reveal the discrepancy between language and things, and thus to advocate the emancipation of thought from language. Almost all the philosophers, from remote times to our own, have been aware of the limitations imposed by language, with the implication that real thinking cannot

be clothed in language. The ordinary view is something like this: thought is primary, and with new terms thought has a better chance for expression. But this argument does not necessarily reveal the nature of the development of human thought. As a matter of fact, it is better to say that language has been a contributing factor rather than an obstacle to the development of thought. Viewing human history as a whole, any new creation in language, *e. g.* new terminology, represents a development of thought along a new line. Language and thought are fundamentally indivisible. Any thought can only be articulated through language or symbol. That which cannot be thus articulated most likely will not be counted as thought. Although language and thought cannot be absolutely identified, they cannot be separated. It is not that language limits thought or hinders it, but rather that language creates thought and develops it. Should we consider the two points together, namely, that thought develops with language and that language is a form of social behavior, it will be clear that apart from the experimental elements all knowledge is social.

With the cognizance of the determination of thought by social conditions, there develops the sociology of knowledge. But the sociology of knowledge has shown only that human thought is determined by socially visible or invisible forces without realizing that apart from all these immediate concrete forces there are underlying social forces of a remote nature. We may identify these remote forces with cultural relations. All thought, in addition to being influenced by our immediate social environment, is also moulded by our remote cultural heritage. The immediate forces determine the trend of our thought, while the remote cultural heritage determines the forms in which thought is made possible. All these forces help to determine interpretative knowledge. With different interpretations come different cultures. And, being born into different cultures people learn to interpret differently. Thus we may use culture to explain categories, and categories to explain mental differences, *e. g.* these between the West and the East.

IV

With regard to types of language, a distinction may be observed between "emotive language" and "referential language".[7] The first is used to arouse, with necessary gestures and appropriate sounds, the corresponding gestures or mental attitudes in the person to whom they are addressed. The latter is used to refer to things and ideas about things, largely in terms of organized symbols or articulate language. According to Darwin, the animal expressions in the form of singing and roaring may be taken as the precursors of human language. Thus emotive language is nearer to elemental expressions and more concerned with mental attitudes while referential language, being nearer to abstract thinking, is more concerned with grammatical constructions than mere changes in sounds.

With grammar and sentence-structure comes logic, and in this connection we have to deal for a moment with the nature of logic. Western logicians take it for granted that the object of logic is rules of human reasoning. This assumption, however, is not quite justified. Take Aristotelian logic, for example, which is evidently based on Greek grammar. The differences between Latin, French, English and German grammatical forms do not result in any difference between Aristotelian logic and their respective rules of reasoning, because they belong to the same Indo-European linguistic family. Should this logic be applied to Chinese thought, it will prove inappropriate. This fact shows that Aristotelian logic is based on the structure of the Western system of language. Therefore, we should not follow Western logicians in taking for granted that their logic is the universal rule of human reasoning.

In so far as the object of logic lies in the rules of reasoning implied in language, the expression of reasoning must be implicitly influenced by language-structure, and different languages will have

[7] C. K. Ogden *and* I. A. Richards, *The Meaning of Meaning*, London and New York, 1930.

more or less different forms of logic. Hence the difference between Chinese logic and Aristotelian logic. In a previous article[8] an obvious example was taken. The traditional type of subject-predicate proposition is absent in Chinese logic. According to the usage of Western logic, in such a sentence as "A relates to B" the form is not a subject-predicate proposition but a relational proposition Another sentence like "A is related to B" is in the form in question, because there is the distinction between the subject and predicate. For both forms, however, there is in literary Chinese only one, that is, *chia lien yi* 甲連乙. Although we may say colloquially *chia shih lien yi* 甲是連乙, the function of the *shih* is that of the so-called "empty words" 虛字, which are used only for emphasis or intonation, without any grammatical function. Both of these Chinese propositions mean the same thing, without grammatical distinction except that the latter is more emphatic. Neither is a subject-predicate proposition. *Lien* relates the two terms *chia* and *yi* but it is not a copula.

Regarding the "empty words" such as *che* 者, *yeh* 也, *hu* 乎, *tsai* 哉, *yi* 矣, *wei* 爲, and so forth, they were not primarily so, their original meaning having been lost. Their function is based on their sounds. As such sounds do not have proper characters, they are represented by characters of similar sounds, which are called "borrowed" 假借 words. Such a "borrowed" use denotes only the sound without any implications as to meaning. The original characters had their own meaning. For example, the *wei* 爲 mentioned a moment ago originally meant *hou* 猴 or "apes". It is the sound, not the meaning of the original which is borrowed. In the formula " ...*che* 者 ...yeh 也", *che* serves the function of a comma and *yeh* that of a full stop. According to the types of language mentioned above, the referential and the emotive, the Chinese "empty words" are emotive words. These empty-emotive-words are closely related to the ideographic nature of Chinese

[8] "On the philosophical difference between China and the West from the standpoint of language-structure", "從言語構造上看中西哲學的差異",東方雜誌, 卅三卷,第七號.

characters, on which we will have more to say later. Now it suffices to say that Aristotelian logic is based on the sentence structure, characterized by the subject-predicate form. Should we alter the sentence structure, the validity of the traditional Aristotelian logic may be questioned. With these preliminary remarks we may proceed to a discussion of the differences between the Western linguistic family and the Chinese language, and their respective influences on logic.

V

Western thought is in the last analysis confined to Aristotelian logic although later developments in logic have gone beyond the Aristotelian type. Modern mathematical logic, for example, is only an extension of formal logic. In no way can it unify all the forms of logic. The reason why Bertrand Russell is opposed to the idea of substance lies entirely in the fact that he has discovered a new logic not based upon the form of subject-predicate proposition. As a matter of fact, however, this new system of logic applies, apart from mathematics, only to the physical sciences. It is not applicable to the social sciences. Therefore, traditional logic is still the "living logic" in the mind of Western thinkers. Now it can be shown that the "ten categories" and the later modified "five predicables" in Aristotelian logic are based on Greek grammar. And so long as definition and division are derived from the "ten categories" and the "five predicables" they in their turn are limited by Greek grammar. The "fallacies" pointed out by Aristotle are essentially those found in the Greek language.

Apart from the obvious examples mentioned above, the basis of Aristotelian logic may be seen definitely to lie in the subject-predicate form of language structure. It is seen in the English sentence "it is", which means "it exists". The verb "to be" has the meaning of existence, and Western logic is closely related to

the verb "to be" in Western languages.[9] It must have occurred to the readers of Plato that the verb "to be" is quite rich in meaning. Many philosophical problems come from it. Because the verb "to be" has the meaning of existence, the "law of identity" is inherent in Western logic; without it there can be no logical inference. Western logic, therefore, may be called "identity-logic".

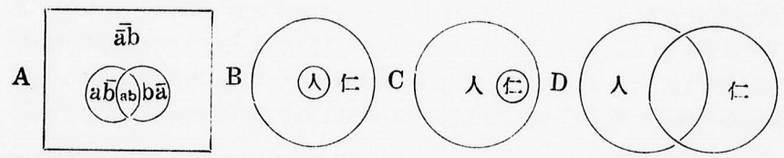
The law of identity does not merely control logical operations such as deductions and inferences but also influences concepts of thought. As we know, Aristotle's philosophy was made possible entirely by the use of "identity-logic". For him the substance is merely derived from the subject and the verb "to be". From the latter, because its implication of existence leads naturally to the idea of "being", and from the former because in a subject-predicate proposition the subject cannot be eliminated. From the indispensability of the subject in a sentence, only a short step leads to the necessity for a "substratum" in thought. For example, when we say, "this is yellow and hard", yellowness and hardness, are the so-called "attributes" which are attributed to something, the something in this case being "this". The "something" in general is the substratum. With a substratum emerges the idea of "substance". The idea of substance is indeed a foundation or fountainhead for all other philosophical developments. If there is any description, it becomes an attribute. An attribute must be attributed to a substance, thus the idea of substance is absolutely necessary in thought in the same way as the subject is absolutely necessary in language. This is the reason why in the history of Western philosophy, no matter how different the arguments may be, pro or con, about the idea of substance, it is the idea of substance which itself constitutes the central problem.

The English word "it" also has its own peculiarities. It is a non-definitive. It denotes *something*, but not *what*. Once the *what* is stated there develop the subject and predicate, or in other

[9] The English forms are used for examples, because they are representative of the general characteristics of the verb "to be" in the West.

words, the substance is characterized by its attributes and the attributes are attributed to the substance. Thus, the separation between existence and whatness was the fundamental condition under which the concept of the substance was born. And this condition is expressed only in Western language-structure. It may be agreed then, after considering the peculiarities of the verb "to be" and the word "it", that many philosophical problems are merely problems of language.[10]

The Chinese language has its own peculiarities. First, it is not essential for a Chinese sentence to have a subject. It it often understood. In a sentence like *hsüeh erh shih hsi chih pu yi yüeh hu* or *kou chih yü jen yi wu o yeh*[11] the subject is eliminated. Examples of this kind are too numerous to mention. The above two are random examples from the *Analects*. Secondly, in Chinese there is no verb "to be" comparable to the English form. The colloquial *shih* 是 does not convey the idea of existence. The literary *wei* 爲 on the other hand conveys an idea of *ch'eng* 成 which means "to become". But in English "becoming" is exactly opposite to "being". Such a formula as "... *che* 者 ... yeh 也" does not mean anything identical, and consequently, does not constitue a logical proposition in the Western sense. If we say "*jen che jen yeh*" 仁者人也, we cannot say the first 仁 is the subject and the second 人 the predicate. In such a sentence the idea cannot be expressed diagrammatically, as is often used in Figure A in the case of Western logic.



10 This view differs from that of the Vienna school, in that according to that school once language is clearly defined some problems will cease to exist. But it seems to me that there are problems arising from language which indicate emotive drives which cannot be eliminated.

11 "When [we] study and constantly review it, is it not pleasant?" 學而時習之,不亦悅乎? "If there is devotion to benevolence, there is no evil." 苟志於仁矣,無惡也.

The other figures B, C, D cannot convey the exact idea of the sentence. It may be either of the three, or it may be in between the three. This is the best proof of the absence of the word "to be" in Chinese.

VI

We have seen above that Western logic is essentially based upon the law of identity.[12] Division, definition, syllogism and even conversion and opposition are based upon it. All these are correlated and constitute a system. The basic structure of Chinese thought is different from this system. The Chinese system of logic, if we may call it a system, is not based upon the law of identity.

Let us begin with Western logical division. As it is based on the law of identity, it must be dichotomous in such forms as "A and not-A", "literary books and non-literary books." Cases like "A and B" or "Good and Evil" are not dichotomous in form because besides A and B there may be C and besides Good and Evil there may be Not-Good and Not-Evil. Thus, there is the need in classification for the rule of exclusiveness. But Chinese thought puts no emphasis on exclusiveness, rather it emphasizes the relational quality between above and below, good and evil, something and nothing. All these relatives are supposed to be interdependent. In a sentence like *yu wu hsiang sheng, nan i hsiang ch'eng, ch'ang tuan hsiang chiao*, or *ch'ien hou hsiang sui*[13] we have a logic of a quite different nature.

Next we come to the discussion of definition. In Western logical definition it is necessary to make the sign of equation between the "definiendum" and the "definiens". For example, "a

12 The rules of "contradiction" and "excluded middle" are simply corollaries of the law of identity.

13 "Something and nothing are mutually generative; the difficult and the easy are mutually complementary; the long and the short are mutually relative; the front and the rear are mutually accompanying." 有無相生,難易相成,長短相較,前後相隨—老子

triangle is a portion of a plane bounded by three straight lines". But in Chinese thought the problem of equation between the two is never thought of. For example, "wife" is denoted as "a woman who has a husband".

This cannot constitute a definition in Western logic, in which it must be condemned as a fallacy, or as begging the question, but it is characteristic of Chinese logic. *Chuan chu* 轉註 or the "inverted use of a word" in classical commentaries belongs to the same category. So also the "metaphoric" use or *chia chieh* 假借. The most important concept in ancient China might be said to be concerned with "heaven" (*t'ien* 天), but according to the definition in the *Shuo Wen* 說文, *t'ien* means the "human head" or that which is above the head 天者顛也. It is evident that that which is above the head may not necessarily be "heaven". There may be many other things such as clouds, wind, the moon, birds and what not. This "indicative" method of definition 指事的訓詁 is quite different from the Western type. Examples of this sort of definition, such as 仁者人也,義者宜也, are too numerous in the Chinese Classics to need mention here. It suffices here to point out that in addition to its difference from the Western type of definition, a Chinese term may also be explained or indicated by another term similar in sound and associated in meaning. To explain a term by means of others of similar sound is inconceivable in Western logic, for Western logic always aspires to be detached from language, and the explanation by means of sound is merely linguistic, it contains no logical implications. In short, it may even be safe to say that ancient Chinese literature contains no such method of definition as that found in the West.

It may be well at this juncture to discuss the Chinese characters *fei* 非 and *pu* 不. In an English sentence like "A is not-B" or "A is not B" the affirmative or negative nature is easily determined. But if in Chinese we say *chia fei yi* 甲非乙, it may mean either the first or the second. The difficulty is not so apparent in this simple proposition, but it is clear that conversion is unnecessary and opposition impossible. In the nature of the case it is, therefore, evident that Chinese thought cannot be placed in the Western logical framework. We must give it an independent name.

It may be proposed to call this type of logic "correlation-logic" or "the logic of correlative duality". This type of logic emphasizes the relational significance between something and nothing, between above and below, and so on. It is expressed sufficiently in the *Book of Changes* 周易. Although modern archaeologists may not accept the *Book of Changes* as one of the earliest records, we cannot say that it does not contain the traditional thought of China. The most dominant note here is the so-called *i yin i yang chih wei tao*.[14] With *yang* 陽 or the positive principle we presuppose the *yin* 陰 or the negative principle, and with the *yin* we presuppose the *yang*. Each is dependent upon the other for its completion. Other examples like *kang* 剛 and *jou* 柔, *chin* 進 and *t'ui* 退, and *chi* 吉 and *hsiung* 凶[15] are exactly similar. Should we wish to adopt a terminology much in vogue, we might call this way of thinking an illustration of "dialectical logic". But this term is very ambiguous, and its historical allusions do not allow it to be adopted in this connection. We will have to be content with noticing that Chinese ways of thinking are different from those characterized by the use of the law of identity. Without defining the different terms used, it is impossible to speak intelligibly in the West. But the Chinese language, which is characterized by the use of correlation-logic, has nothing to do with identification. Rather it uses antonyms to make an idea complete.

Opposition as a means of expression is not only used in propositions like "death without passing away", "a great sound but scarcely audible", "the greatest omen without being visible", non-resistance means strength", or "the most fluent speech seems to

14 一陰一陽之爲道. "The positive and negative principles constitute what is called *tao* 道 or nature."

15 Emotive and phlegmatic, assertive and resigned, lucky and unlucky.

stutter,"[16] but it is also used to denote a single term. In the *Shuo Wen*, for example, "outgoing" 出 means "incoming" 進 and "disorder" 亂 means "order" 治.[17] In this case, it is better not to consider the words as having contradictory meanings, because it is the meaning, not the word, which awaits its opposite for a complete illustration of the connotation. For example, *ch'u* 出 must wait for *chin* 進.[18] Without *chin* there cannot be *ch'u*. Other examples such as *luan* 亂 and *chih* 治 and *kung* 貢 and *tz'u* 賜[19] are similar in nature. The explanation of the word "to sell" is also given by means of its opposite "to buy". "To sell" and "to buy" in contrast to each other become clearer, because buying and selling constitute the same transaction when viewed from the different standpoints of the buyer and seller. From this it is seen that Chinese thought is not based upon the law of identity, but takes as its starting point relative orientation or rather the relation of opposites. This type of thought evidently constitutes a different system. This system is probably related to the nature of Chinese characters. Being ideographic 象形 Chinese characters put emphasis on the signs or symbols of objects. The Chinese are merely interested in the inter-relations between the different signs, without being bothered by the substance underlying them Hence the relational or correlational consideration. (In later developments of the same trend we have in literature the styles called *p'ien wen* 駢文[20] and *lü shih* 律詩[21] which are not paralleled in other countries.)

VII

The ideographic nature of Chinese characters influences not only the structure of the Chinese language but also the thought

16 死而不亡,大音希音,大象無形,守柔曰强,大言若訥.

17 See more examples in a recent article by Tung Fan. 董璠, "反訓纂例", 燕京學報. 第二十二號, 1937年十二月, p. 119-174.

18 "Outgoing" and "incoming".

19 "Disorder" and "order", "tribute" and "grants".

20 Characterized by dissyllabic phrases.

21 Verse in couplets.

or philosophy of the people as well. The *Book of Changes* may be taken as the best example. Most probably words were originally coined as token-symbols. Thus, it is said "the sage arranged diagrams 卦 in order to see the significance of any sign 象".[22] Although we are not quite justified in saying that the diagrams are the original Chinese characters, it may at least be granted that they are similar in nature to Chinese characters. The creation of the diagrams served the purpose of divination, but there must have been previously arranged limits of possible combinations for the purpose of divination. Each combination is a possible sign. "Heaven indicates good and bad fortune by signs which are signified by the sages."[23] The "sages" must have been such heroes of cultural history as Pao Hsi Shih 包犧氏, to whom the discovery of the diagrams was attributed. It may be said that the signs do not merely symbolize something external but also indicate possible changes. For example, it was from the *yi* 益 diagram that farming implements 耜耨 were invented, and from the *li* 離 diagram that fishing nets 網罟 were invented. Dr. Hu Shih has well said, "Confucius was of the opinion that with the genesis of the signs there come things. The signs are the primeval archetypes after which things are modeled."[24]

According to ancient Chinese thought, first came the signs then the development of things. This assertion is quite different from that of the West. Although Platonic ideas have a superficial resemblance, it must be remembered that Plato's "ideas" are self-existent, which is not true in the case of the eight diagrams. As we have seen, Western thought is consistently based on the idea of substance. Consequently there is the need for a substratum, and the final result of this trend of thought gives rise to the idea of "pure matter". It is characteristic of Western philosophy to penetrate into the background of a thing, while the characteristic of Chinese thought lies in exclusive attention to the correlational im-

22 "聖人設卦觀象".

23 "天垂象, 見吉凶, 聖人象之".

24 Hu Shih, "孔子主張象生而後有物: 象是原本的模型,物是仿效這模型而成的".

plications between different signs, such as *yin* and *yang*, *ho* 闔 and *p'i* 闢[25]. It is also because of this fact that there is no trace of the idea of substance in Chinese thought. It should be noted that the presence of an idea gives rise to word-forms with which to express it. In China there is no such word as substance. Such words as *t'i* 體 and *yung* 用,[26] *neng* 能 and *so* 所[27] in their function of expressing subject and object came from the translation of the Buddhistic scriptures. It makes no difference to the Chinese mind, whether or not there is any ultimate substratum underlying all things. Because the Chinese characters are ideographic, Chinese thought takes cognizance only of the signs and the relations between them.

It must be evident thus far that there is not only a close relation between logic and language, but that a logical system must presuppose a philosophy, that is, cosmology and the philosophy of life. Chinese cosmology may be called "significism" 唯象論 or "omenism". The Chinese character *hsiang* 象 which we have translated as "sign" has all the meanings of the English words phenomenon, symbol and omen, but it must be noted that behind the *hsiang* no concrete things are implied. Its signification is only concerned with human affairs. Thus a sign is for the purpose of giving lessons to the people, and consequently, all the heavenly phenomena such as stars and comets were taken as evil omens. The Chinese cosmogony characterized by omenism is essentially a practical guide to human life. In this point it also differs from the West. It may be true that in Western philosophy, cosmology is a preliminary step to the philosophy of life, but the two cannot be confused. Chinese thought, on the contrary, does not make any distinction between the cosmos and all the problems of human life.

According to Western tradition philosophy may be classified into ontology, cosmology and the philosophy of life. In China there

25 Involution and evolution.
26 Body and function.
27 Similar in use to "knowing and known".

are only cosmogony and the philosophy of life, without any ontology or cosmology proper and even cosmogony is absorbed into the philosophy of life. The reason for this lies in the neglect of the law of identity on the part of Chinese thinkers. Even such expressions in the *Lao Tzu* 老子 as "*t'ien ti ken*" and "*tao chi*"[28] are only concerned with the origin of the universe. In spite of the fact that the later development in the *Chuang Tzu* 莊子, in such a sentence as "whether an object is made or unmade it remains same thing."[29] is often alleged to be similar to Western substance, the aim of Chuang Tzu is only "the proper degree of adjustment".[30] Consequently, his identification of the cosmos with the self is only a sort of mystic experience. In other words, he is concerned with "participation" or "transduction"[31] rather than with the problem of existence. The book *Chuang Tzu* has a mixed origin. It is doubtful whether there may not have been insertions and alterations on the part of the Wei and Chin scholars, but it is evident that the author's ideas are more or less similar to those of the Hindus.

The later cognizance of the problem of substance on the part of the Chinese is due to the influence of India. The ethical systems of the Sung and Ming dynasties are merely reactions against Buddhism. It is often said that Western philosophy began with the idea of substance and later got rid of it, and that China originally did not have it — but later acquired it. She acquired it through cultural contact, a fact which raises problems which cannot be discussed here. Our problem is whether or not there are original forces which still underlie Chinese thought, whether, for example, the Chinese mind is still characterized by neglect of the idea of substance. The weight of evidence, in spite of abundant Western influences, is that it is.

28 天地根 root of heaven and earth; 道紀 beginning of the Way.
29 物無成與毀, 復通爲一.
30 適得而幾已.
31 These terms are borrowed from Jean Piaget, *The Child's Conception of the World*, New York and London, 1929.

VIII

Because the idea of substance is related to the idea of causality most of the sciences are still determined by the concept of causality. At this point it may be said that Kant was the first to reveal the mystery of Western thought. He is not surpassed by anyone, even today. He puts the idea of reciprocity between the ideas of substance and causality in order to make the three interdependent. Consequently, wherever there is causality there must be reciprocity, and wherever there is reciprocity there must be substance. No one of the three is dispensable. From this we may learn that the idea of causality is derived from that of substance. That causality is later combined with substance gives rise to the idea of the atom. On this ground is based our thesis that in Western thought religion, science and materialism are interdependent, a position which is not taken by recent Chinese scholars.

Roughly speaking, there are two forms of religion in the West, the early Greek type and the Christian type. The first is neither monopolized by the Greeks nor is it exclusively Western. It is similar to that of the early Chinese life. It should be remembered in this connection that in Greek mythology there are potentialities of materialism. And the early religion of China, as of all early societies, was close to Nature. But when theology developed it had to be based upon the idea of substance. The idea of the Supreme Being or a Creator is closely correlated with the idea of Substance. Furthermore, it is also closely connected with the idea of identity. Metaphysics, which is based on substance, is religion. An Ultimate Reality is in essence God. Thus it may be maintained that metaphysical or ontological philosophy is a type of religious thought. The logic characterized by the law of identity underlies this type of religious thinking. Finally, it may be said that ontology in philosophy, the idea of God in religion and the law of identity in logic are in essence one and the same thing.

Spengler[32] has shown that "there is no natural Science without a precedent Religion." Whitehead also maintains that the development of modern science was closely related to the religious beliefs of the medieval ages. So long as science is related to religion it is to be understood that in Western culture the two are but different streams from the same fountain head. They are not so much opposed as ordinarily assumed. But this should not be understood in causal terms; the one does not determine the other, they are both parallel developments from a common origin. Thus although science and religion are opposed to each other on the surface, they are not opposed in their innermost nature.

Furthermore, Spengler has informed us that Catholic cosmology and materialism are not different things, but the same thing expressed in different terminology. Leaving aside Catholicism, we may say that materialistic thought is based on the idea of atoms, and the idea of atoms is related to the ideas of substance and causality. We may maintain that there are three fundamental categories in Western thought, substance, causality and atoms. Religion has a foundation in substance. With causality science is developed, and from atoms materialism is derived. Behind these three categories there is another to string them together, namely, that of identity. The French philosopher Meyerson has done a service in pointing out that all scientific theories and quests are concerned with identity.[33] It may be easily seen that with identity there must be substance; with substance there must be causality; and the atom is between the two. Thus Western thought is essentially based on these four categories. Without understanding the importance and priority of these categories, we cannot thoroughly understand Western culture and thought.

Chinese culture, on the other hand, has no relation whatsoever to the above-mentioned categories. Let us begin with early religious life in China. The Chinese religious life is not very

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32 Spengler, *op. cit.*, v. 1, p. 380.
33 Emile Meyerson, *Identity and Reality*, New York, 1930.

unlike that of the Greeks. Yet religious ideas in China were not associated with the rituals of worship and the institution of official temples. It is not certain whether there were any other deities before the concept of Heaven arose. But so far as Heaven 天 and God 帝 are concerned, the Chinese have never been concerned with them primarily. When we speak of Heaven we have in mind only Providence 天意, which is merely a manifestation of Heaven. In other words the Chinese are concerned with the will of Heaven without being too particular about Heaven itself, because according to the Chinese point of view the will of Heaven is Heaven itself, and to inquire into Heaven without paying attention to its will is logically inconceivable in China. Heaven and the will of Heaven are the same thing. There is not first Heaven and later the manifestation of its will. Because Heaven and its will are identical, the Chinese have never considered Heaven as an entity, and so long as it is not an entity it is not a substance. Thus the Chinese Heaven has no relation whatsoever to the Western substance. Mr. Creel in *The Birth of China* has taken Heaven as a spirit because the Chinese character looks like a human figure 人 in the inscriptions on metal. This theory may be objected to. Taking it for granted for argument's sake that the Chinese character *t'ien* 天 is a human figure, this inference of Creel's does not necessarily follow. The Chinese always take *t'ien* to be something beyond the collective will of the people, uninfluenced by human effort. It is inconceivable for Heaven to be similar to a human figure, even if this human figure be that of a Great Man and not an ordinary person. Creel seems to have adopted the Western point of view in interpreting this Chinese character. Chinese scholars have classified the character *t'ien* 天 as "indicative" or *chih shih* 指事 which is very practicable and needs no modification. The reason why Heaven is identified with its will lies in the fact that the latter is only known by means of divination. Through divination the gap between man and Heaven is bridged. The Chinese are only interested in knowing the will of Heaven in order to seek good fortune and to avoid misfortune. As to the nature

of Heaven as such they are indifferent. This fact shows that the Chinese have not applied the category of substance to the idea of Heaven and have not taken Heaven as the ultimate stuff of the universe.

Another point of interest is the fact that most of the statements concerning the will of Heaven in the *Shang Shu* 尚書 indicate only the transfer of political power among different dynasties or from one dynasty to another. Political power was alienated in China in two ways, the hereditary and the revolutionary. When hereditary rule was abused it gave rise to revolution. No trouble arose in the case of the hereditary transfer, but there had to be a justification for a revolution, and the justification was found in the will of Heaven. Such a revolutionary transfer has great political and social consequences. That this is attributed to the will of Heaven is evidence that all great changes are beyond the control of the human will, and that the will of Heaven is only manifested in politics and social life. This is just the reverse of the case in the West in which the concept of substance was taken as the basis for its emphasis on religious thought.

In this connection something might be said about the changes and influences of religious life in China and the West. In the West the Greek type of religious life ended by the time of the unification of the Roman Empire, but the new form of religion survived the decay of feudalism. Consequently, Western religion and politics are dual currents. Chinese religious life, which bore many resemblances to that of Greece, was a powerful support of Chinese feudalism, which was similar to the European. In the time of the *Ch'un-Ch'iu* feudalism was shaken and the thought of the people was no doubt affected. Hence such statements as "the Heavenly path is far and the human path near",[34] and "what has Heaven said? Yet the four seasons are functioning regularly".[35] Confucianism, without having done away with the doctrine

34 天道遠人道邇.
35 天何言哉？四時行也.

of Heaven, pushed it beyond human affairs. This type of thought had a tendency to make religious belief less influential in China, and later there was only politics and no religion. The same trend is manifested in thought, and we may recapitulate by saying that the law of identity in logic, the subject-predicate proposition in sentence-structure, and the category of substance in philosophy all have religious thought as a background. This is characteristic of Western culture. Correlation-logic, non-exclusive classification, analogical definition, all have political thought as a background. This is characteristic of Chinese culture.

IX

These two types of thought differ not only in their categories and their basic rules of logic but also in their attitudes. In putting a question about anything, it is characteristic of Western mentality to ask "What is it?" and then later "How should one react to it?" The Chinese mentality does not emphasise the "what" but rather the "how". Western thought is characterized by the "what-priority attitude", Chinese by the "how-priority attitude". In other words, Western people use the "what" to embody and absorb the "how". The "how" is to be determined by the "what". The Chinese on the other hand use the "how" to imply the "what". The "what" type of thought may develop through religion to science. This is one of the characteristics of scientific thought. The type of thought characterized by emphasis on the "how" can develop only in the socio-political sphere, especially in connection with the problem of ethics. Neglect of the "what" accounts for the neglect or absence of epistomology in China.

That Chinese thought always centers on human affairs while neglecting nature may thus be accounted for. It is often alleged that in Chinese philosophy there are disputes between nominalism and realism and the problem of the relation between Man and Nature, thus implying that Chinese philosophy is similar to Western

philosophy. In fact, it is not so. The Chinese interest in the problem of nominalism and realism, as well as in the problem of the relation between Man and Nature, is concerned with socio-political thought and the philosophy of life.

Chinese and Western thought differ also on the question of inference. The syllogism, which is based on the law of identity is the form of inference in Western logic, while the Chinese use analogy instead of inference. The formula mentioned above. *jen che jen yeh* 仁者人也 is a type of analogical thinking. Other examples from Mencius are more to the point, for example, "the goodness of human nature is like the downward tendency of water"[36] and "Does not life mean nature just as white means white? Does not the whiteness of a white feather mean the whiteness of white snow, and the whiteness of white snow mean the whiteness of white jade?.....if so, then is the nature of the dog similar to that of the cow, and the nature of the cow similar to that of man?"[37] Such examples in Mencius are too numerous to need further quotation. I. A. Richards in his *Mencius on the Mind* contrasted this type of argument with the Western type. The former may be called the "logic of analogy". This logic, as a matter of fact, though it cannot be appropriately applied to scientific thought is what is largely used in socio-political arguments. Analogical argument indeed is one of the characteristics of political thought. Marxism may be taken as one of the best examples. The formula, Thesis-Antithesis-Synthesis, which is to be applied to any historical process, is analogical in nature. In the same way we may consider the transformation of seeds into trees, as the antithesis of the seeds. So also the theory of the class struggle is argument by analogy. Without criticising the fallacy implied in Marxism it may be profitably observed that the Marxian philosophy is political in nature.

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36 人性之善也，猶水之就下也.

37 生之謂性也，猶白之謂白歟？白羽之白也，猶白雪之白；白雪之白，猶白玉之白歟？然則犬之性猶牛之性，牛之性猶人之性歟？

X

The type of thought primarily interested in politics may also have some connections with language. Thus, Confucius was for the "rectification of names" or *cheng ming* 正名. The rectification of names was not advocated by Confucius for the sake of logic but rather as the means by which the order of society was to be maintained. Hence the saying "If names be not correct, language is not in accordance with the truth of things. If language be not in accordance with the truth of things, affairs cannot be carried on to success. When affairs cannot be carried on to success, proprieties and music will not flourish".[38] The function of the rectification of names lies in the discernment between what is above and what is below, the determination of the superior and the inferior and the distinction between good and evil. Its aim lies in human affairs rather than in logic. For example, to kill a king is called murder or *shih* 弑, implying that this involves a violation of the superior by the inferior. The killing of an inferior by a superior is called execution or *chan* 斬, implying that the executed is justifiably punished according to law. For the emperor to travel is called *hsing* 幸 or "to favor". To "come directly" is called *lai* 來 and "to come to settle" *lai kuei* 來歸. To go from the local districts to the central government is "to go up" or *shang* 上 as in the expressions "to go up west" 西上 and "to go up north" 北上. And to go from the central government to the local regions is to "go down" or *hsia* 下, such as to "go down south" 南下, to "go down east" 東下. There are similar distinctions in English as seen already in these translations, but their emphasis is not so obvious and systematic. Dr. Hu Shih considers all these distinctions merely those of parts of speech with grammatical functions. He further remarks "Confucius by rectifying the names is the first logician in China".[39] But such, as we have seen, is not the case.

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38 名不正則言不順,言不順則事不成,事不成則禮樂不興.

39 孔子的正名主義實是中國名學的始祖.

Further proof may be found in a comparison with Western grammatical changes. Take the English word "sense" for instance. Its changes may take the following forms; senses, sensation, sensational, sensible, sensibility, sensum (sensa), sensationalism, senseless, sensitive, sensitivity, sensibly, sensory, sensorium, etc. All these forms are derived from the same root. Because of the use of inflections, cases, or other grammatical forms the "form" is an essential element in Western thought. In spite of the fact that the Aristotelian idea about "form" may be different from that of Bacon and the Baconian "form" from that of Kant, it may be observed that among all of them there is something basic and uniform, namely, the emphasis on the idea or "form". The Chinese characters are ideographic; though they have radicals or *p'ien p'ang* 偏旁 they do not have roots. The radicals are used merely for the purposes of classification, for example, certain words belong to the realm of water and others to the realm of plants. Whenever there is a new idea a new word must be invented, a new word not derived simply from a root. Chinese ideographs are not subject to grammatical changes; there is no inflexion, declension or conjugation.

As the creation of new words must be based upon the needs of society, it is interesting to note that the most numerous terms in China come from two realms; the one, kinship, illustrated by *po* 伯 or father's elder brother, *shu* 叔 or father's younger brother, *t'ang* 堂 or paternal cousin, *piao* 表 and *yi* 姨 or other forms of cousins; the other from the realm of ethics, illustrated by *chung* 忠 or loyalty, *hsiao* 孝 or filial piety, *lien* 廉 or frugality in taking and *chien* 儉 or frugality in spending. All the fine shadings in Chinese terminology in these two fields may be lumped together in such English terms as brothers, uncles, cousins, frugality. Such a lumping together is justifiable in the West, but in China all the differences must be preserved owing to their social significance, and we may attribute such fine shadings in Chinese terminology to the rectification of names.

It should be explained also why the type of thought which is interested in politics values more highly the logic of correlation. The reason lies in the fact that in social phenomena anything may be considered in terms of correlations, such as male and female, husband and wife, father and son, the ruling and the ruled, the civil and military, and so forth. It is but a short step from this realm to that of cosmology. For example, we say, "with Heaven being superior and the Earth inferior the universe is fixed".[40] Furthermore political affairs may have cosmological implications; for example, from the positive 陽 and negative 陰 principles in the cosmos we may derive the principle of evolution 闢 and involution 闔 underlying the universe and human affairs, finally to be developed into such concepts as proper rule 治 or disorder 亂 in political affairs. It should be remembered that this type of thinking is characteristic of political and social thinking.

Even in this, however, there is a difference between China and the West. It is true that Marxism has done away with the law of identity, and has advocated the law of opposition in thinking, being essentially a philosophy concerned with political and social affairs. But its difference from Chinese thought lies in the fact that while Marxism puts emphasis on opposition and thus class struggle, Chinese thought puts emphasis on the result or adjustment of such an opposition. When Mencius said "mental laborers rule while manual laborers are ruled",[41] the emphasis is on the division of labor, and mutual aid as conceived by him is thus made possible. In contradistinction to the Chinese logic of correlation, the Marxian type of logic may be called the "logic of opposition".

XI

Now we are in a position to discuss the relation between logic and categories on the one hand and human nature on the

40 天尊地卑,乾坤定矣.
41 勞心者治人,勞力者治於人.

other. With a given event, we may have different interpretations. For example, sunset is an observed phenomenon concerning which there may be different interpretations, such as, the sun goes beneath the earth westward, or, the earth turns eastward. It is therefore, that identity, substance and causality, are all interpretations, or concepts employed in the act of interpretation, and these concepts themselves are interpretative in nature.

But it may be asked, from what do these interpretations arise and how do they become valid? We may borrow the terms from Pareto without following him in their further implications. According to him there are "residues" and "derivations". The first are the emotional drives and the latter, outward manifestations or rationalizations. A distinction may be made between two kinds of residues, namely, the "residue of persistence" and the "residue of dominance". From the "residue of persistence" develops religious thought; and the category of substance, the subject-predicate proposition, the logic characterized by the law of identity, and the concept of causality developed thereby are its derivations. From the "residue of dominance" comes all social thought, political theories and the concrete institutions developed thereby. All the derivations are derived from residues which are rooted in emotional drives. In order to express these emotional drives there are all the religious and political developments or derivations. Students of culture cannot afford to forget that these residues, persistence and dominance are universal traits of man. And, it must be granted that it is not only in the social and political fields but also in the linguistic and mental fields we can see the universal traits of man. The reason why there are cultural differences between China and the West, seems to lie simply in the development and underdevelopment of the derivations along certain lines. It is not that the Chinese do not have the "residue of persistence", but in their original culture or derivations it is not developed. But once in contact with India, the Chinese gave a warm reception to its religion, because Buddhism aroused the "residue of persistence" dormant in the Chinese nature. Chinese culture being

underdeveloped in this respect, Buddhism found in China a second home.

Neither is it that the Western people do not have the residue of dominance. Western philosophy is certainly a transformation of religion. Kant, as we have known, in his study of knowledge has given a theoretical justification for the existence of substance. But his *Critique of Pure Reason* has left room for his *Critique of Practical Reason.* If in knowledge the substance is not revealed, it is certainly in conduct that it is realized. In these respects Kant, although trying to analyze Western thought, is limited by it. His attitude, it must be remembered, is the traditional Western attitude, namely, that of using religion as an indirect means for approaching society and politics. From this it may be observed that all Western metaphysics, is essentially socio-political in nature. But the relation between the two is not so obvious. It is to the credit of Marxism that this point is clearly grasped. It is a pity however that it has too narrow a conception, in taking classes for society. In a previous article on "What is Philosophy?"[42] a fuller demonstration was made. Metaphysics was taken as merely a rationalization of social and political thought. The pure theoretical aspect of Western philosophy is nothing but a disguised form of socio-political thought. This observation may seem to be exaggerated, but as a matter of fact, philosophy is part of culture and culture always constitutes a total configuration. Politics, society and human life cannot be divorced from philosophy. It is often alleged that philosophy is primarily concerned with the unraveling of the secrets of the universe, but this view seems very superficial. Two attitudes are usually taken towards the social and political problems of the present. The one attitude seek to conserve, the other to change conditions. Marxism may have gone too far in identifying idealism with conservatism and materialism with revolutionism, but the fact remains that idealism and materialism are related to society and politics.

42 "哲學是什麼?" 東方雜誌, 34卷, 1號, p. 273-282.

It is on this ground that the views of the Vienna school, for example those of Carnap should be reconsidered. Carnap considers all philosophical propositions as "nonsense" because they are not verifiable. He needs hardly be reminded that there is much in human knowledge that cannot be verified; and we cannot say that anything that is not verifiable is not true. Rousseau's famous sentence "man is born free" cannot be verified. Yet it helped in contributing towards American Independence and the French Revolution. Social thought is not concerned with verification. It is *unverifiable* but *realizable.* This is the basis for the Determination of Man to combat Nature,[43] as we say in China. Western metaphysical thought is nothing but socio-political theory in another form. And consequently, philosophy has this unverifiable but realizable nature.

XII

Before concluding this essay, my own theory of knowledge may be briefly formulated. It seems to me that human knowledge may be considered in four groups, each penetrating into and dependent upon the others. The first is the external "structure", which accounts for immediate sensation. The external world being merely "structure", we can only know its "mathematical properties", to borrow a term from Russell. As to its qualitative nature, we know nothing. But it must be pointed out that these mathematical properties are not static and rigid, but flexible and changeable. The second group is the "sensa", to use the terminology of neo-realism. Our sensation is a curious thing. Although externally aroused, it is different from the external world in nature. There may be said to be correspondence and not identity between the two. Sensation by its nature is something independent. The third group consists of "constructions". The ordinarily perceived tables, chairs, houses, friends and what not, are "constructions".

43 人定勝天.

These constructions are often taken naively as independent self-existent things. But as a matter of fact, these things are constructed through the perceptions of the observer. The fourth group is what we have already discussed as "interpretation". These four groups are interdependent. Comparatively speaking, the first two are more closely related to the external world and, therefore, more objective, while the last two are more closely related to the inner world and, therefore, more subjective. The process from the last two to the first two may be called the process of "attachment" while the reverse may be called that of "detachment". Theoretical knowledge is a process of detachment. After detachment theoretical knowledge still invisibly underlies positivistic knowledge. The problem of validity occurs only after the process of detachment. Because of the fact that there may be different interpretations, the problem arises as to which is right and which is wrong, or which is reasonable and which is not. (As a matter of fact from the cultural point of view there is only difference, and no correctness or incorrectness). And this is characteristic of theoretical knowledge to which philosophy, social thought, political theories and religious beliefs all belong. For a fuller epistemological treatment in this case a previous article of the writer, entitled "Pluralistic Epistemology Retold"[44] may be consulted.

In conclusion, we may say we have discussed the following points in order to show that human culture[45] constitutes a whole; first, what is Western philosophy? Second, what is the relation between language and thought? Third, what is the relation between logic and philosophy? Fourth, what is the relation between philosophy and socio-political thought? Fifth, what is the relation between philosophy, society, politics and religion? Sixth, what is the relation between theoretical knowledge and perceptual knowledge. Seventh, what is the relation between human nature and

44 "多元認識論重述," 張菊生紀念論文集, 頁 95-137.

45 Culture in our discussion is confined to the mental aspect. Its material aspect being outside the scope of the essay this is not discussed. This should not however be taken as implying that culture has no material aspects.

culture (between "residues" and "derivations")? Eighth, what is the difference between Chinese and Western thinking processes? All these points have been discussed from the point of view of philosophy; if they have any bearing on sociology, evaluation and criticism must be left to the sociologists.

Should the reader have the patience to follow through all the discussion, it may seem to him that the writer has been too ambitious and guilty of eclecticism. But there is eclecticism and eclecticism. Should eclecticism prove useful in offering a more synthetic view of all the related problems, it does not need too much apology.

After the above had been penned, the writer was referred to a review[46] by M. Kumano of a previous article "On the Philosophical Differences between China and the West from the Standpoint of Language-structure."[47] It was misunderstood as maintaining that thought is determined by language. Mr. Kumano seems to be blinded by the traditional points of view, without realizing that it is certainly wrong to argue in deterministic terms, either in considering thought as determined by language or in proposing that language is determined by thought. The thesis as expounded there as well as here is simply that language, logic and philosophical thought are interconnected and interdependent.

Chang Tung-sun 張東蓀

June, 1938.

46 熊野正平, 支那研究, 東亞同文書院, 第 41 號, 1936年 6月

47 "從語言機造上看中西哲學的差異", 東文雜誌, 卅三卷, 第七號.

Supplementary notes:

1) "Categories" are to be understood in a broader sense, in the sense that they are used to guide and interpret perceptual knowledge. In Whitehead's "conceptual scheme" time and space are included. Thus he is justified in attributing conceptual knowledge even to animals other than man. To me, time and space constitute only a "framework", which may have the function of ordering perceptions, but which has no interpretative function in the realm of cultural events. By categories I mean especially those excluding time and space, and my interest is only in the field of culture.

2) By subject-predicate proposition we are neither to be understood as following the definition of ordinary grammar, nor as following that of the new school of logic. The latter is too narrow in accepting "He is wise" and rejecting "He is a wise man" as a subject-predicate proposition, while the former is too broad in taking as predicate any part of a sentence other than the subject and its modifier. Our use here is defined by traditional logic, especially based on Aristotle, in accepting as subject-predicate proposition any sentence which has a copula. "Brutus killed Caesar" is outside our definition unless it is changed into "Brutus is the man who killed Caesar". The change may seem to be unnecessary so far as sense is concerned. But our problem in logic is concerned with the subject and its attributes. And by using the subject-attribute category to classify any proposition, we may be forced to translate "Brutus is the man who killed Caesar" into "Brutus has the property of killing Caesar". The latter is the logical analysis of the former sentence. By subject-predicate proposition, by which we characterize Western thought, we mean such a sentence as "Brutus is the man who killed Caesar".

3) By "logical definition" people usually mean more or less the connotation and denotation of a term. Here we are more strict than this. We are only concerned with the formula *per genus et differentiam*. The so-called nominal definition is also to be excluded.

4) By correlation-logic we mean that kind of logic in which one term waits for its opposite in order to complete its meaning. "Relationism" may be better, had it not been used by Mannheim in his perspectivistic sense. Relativism or relativistic or relativity are also inapplicable because of their respective historical allusions.

5) By the Greek type of religion we mean the mythological beliefs of everyday life, not the establishing of institutions, temples and their corresponding rituals. The Greek type of religion, for our purposes, is not to be understood as Greek religion, which had different levels.

6) When we characterize Chinese thought by its emphasis on the mean or middle, the term is not to be understood in its mechanical sense, which would imply independent extremes. The Chinese term *chung* 中 is nearer to implication or dialectical implication. From this dialectical nature comes the law of correlation.

7) By analogical thinking we mean the method of expression by means of analogy, not merely thinking in terms of analogy. To think in terms of analogy is a recognized feature of child psychology, as is shown clearly by Piaget. Although expression by means of analogy and thought in terms of analogy have necessary relations, they are not the same thing. We are interested here in the method of expression. In expression we find some connection with the law of correlation, which is not merely due to immature thinking. So far as characteristic types of thought forms are concerned, the usual comparison between China and mediaeval Europe is not adequate, although Chinese life as a whole is not modern.

8) In saying that Western philosophy is a disguised form of socio-political thought, we are interested in showing that any such thought, in order to be theoretically comprehensive, will result in a *Weltanschauung*, which, in order to be thorough and consistent, will in turn result in metaphysics. Thus the philosophy of life is a justification for socio-political thought, and metaphysics is a justification for the philosophy of life. But limited by their own ethnocentrism, Western people do not know how to work consciously from their socio-political thought to philosophy, merely assuming the priority of their metaphysics, and thus thinking that political philosophy is only an application of metaphysics. The order from socio-political thought to the philosophy of life and metaphysics is the natural one, while it is the reverse, which is actually assumed. It is a service to reveal the natural objective order.

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A STUDY OF THE EGG TRADE IN THE PEIPING AREA

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A STUDY OF THE EGG TRADE IN THE PEIPING AREA

INTRODUCTION

This study attempts to present a picture of the chicken egg trade of the Peiping area. Within the said area. there are located two final markets, namely, Peiping and Tientsin—the former, with a population of one and half millions, being a consuming center with an annual consumption which may well approximate to 30 to 40 million eggs[1], while the latter, one of the leading egg exporting ports, often ranks next to Shanghai. As a result of the immense demand in these two markets, poultry raising has become a popular subsidiary enterprise among farmers of the neighbourhood regions. Having seen the importance of this enterprise to both the nation[2] and the individual farmer, this study is made to reveal features that are involved in the production and marketing of the product, to determine the efficiency of the existing system, and to furnish the knowledge that may be desirable in considering future development, especially the development of a co-operative system.

The study is done under the joint auspice of Rev. J. A. Hunter of the Lu Ho Rural Service Center of the American Board Mission, and Prof. J. B. Tayler of the Department of Economics of Yenching University. The materials here presented were chiefly collected in the period from October, 1935, to February, 1936, by Mr. Y. S. Wang who has travelled along the Peiping-Tientsin and Peiping-Kalgan Railways and familiarized himself with the conditions that exist in the area. He has been allowed to go through the accounts of the native egg dealers

1 Cf. Gamble, S. D., *How Chinese Families Live in Peiping*. pp. 100-101; 329.
2 Eggs and egg products occupy the 3rd or 4th place in China's export trade.

and has also had personal interviews with them and opportunities of a more penetrating insight into the nature of the trade.

The present report contains two parts. Part I describes the production as a whole, and deals with the condition of poultry raising, its relation to the organization of farms, and the varieties and characteristics of the poultry and eggs. A detailed account of native hatcheries and the supply of young chicks is also presented.

Part II gives an account of the marketing system. In this part, as effort is made to present a concrete description of the organization of the market, its operation and function. This is followed by an analysis of the costs of marketing and the transportation of the product. The study of the price movements, the description of the enterprise as an international trade, and the analysis of the sources of supply constitute the rest of this part.

At the end of the report, an appraisal of the system is made. It also suggests ways of improvement from the point of view of a co-operative system.

PART I. PRODUCTION

a. Poultry Raising and Farm Economy

Poultry raising, a common farm enterprise in this area, is a minor sideline of agricultural industry. It is usually handled by the women of the family. The flocks are left to themselves to scratch for food on the ground and are not given any proper care. The size of a flock varies from one or two birds to several tens. According to the data collected, the flock raised by a Liu family in Ch'eng Tzu Wu T'sun (成自務村), Hsiang Ho Hsien (香河縣), which consist of a little over seventy birds, ranks first in size. This is not usual, the average size being fifteen to twenty chickens.

The small size of the farm flock is chiefly due to the fact that income from the industry mostly goes to the female head of the family as her own pocket money. This practice makes the male head feel that the industry is not profitable and prevents it from growing too large. The village organization is another hindrance to a large flock. Only homes on the outskirts of the village can provide ranges large enough for thirty or more birds.

b. The Poultry

The most common native breed of poultry we found in the area is that called Ch'ai Chi (柴雞). Another native breed is called Yu Chi (油雞) raised only in a limited area west of Peiping. As this type is chiefly used for meat supply, it is of no importance in the study. The Ch'ai Chi lays on an average 120 eggs a year, while, according to the experiment made by the Chicken Improvement Farm of the Lu Ho Rural Service Center, it may lay up to 180 eggs a year. The producing rate is poor if compared with the imported breeds. According to the record of the same farm, a White Leghorn may lay 300 and a Plymouth Rock, 210 eggs a year. The hen (Ch'ai Chi) begins to lay at the age of eight months. From the second to the fourth year is the most productive period, the producing rate starting to decline after this and ending altogether at the age of seven. From April to October, with the exception of July, is the heaviest production season within the year, as the extremely hot and cold weather generally affect the production.

The fowls are seldom properly fed. They are left in the yard to pick up worms and grain that are left on the ground. Only during bad weather are they fed with spoilt grain mixed with chaff. It is reported that the well-to-do farmers may feed the chicken with millet or corn twice a day, once in the morning and once at dawn. This, however, is very rare.

c. *The Egg*

The eggs that one can find in markets fall into three kinds—the Yang Chi Tzu (洋雞子), i.e., eggs laid by hens of imported breeds, the Yu Chi Tzu (油雞子) and the Ch'ai Chi Tzu (柴雞子). Of the three kinds, the Ch'ai Chi Tzu is the main one that is supplied in immense quantities. The Yang Chi Tzu comprises only a very small number supplied by the flocks kept by improved chicken farms or by city families who take poultry raising merely as a sideline to their main occupation. The supply of the Yu Chi Tzu, though larger than that of the Yang Chi Tzu, is still low if compared with that of the Ch'ai chi Tzu. Moreover, the breed is found in Peiping only.

The Ch'ai Chi Tzu is further divided into two kinds in Peiping. They are called the K'ou-wai Chi Tzu (口外雞子) and Fu-ti Chi Tzu (伏地雞子). The K'ou-wai Chi Tzu is that in districts north of Kalgan while the other is that laid in areas south of that city.

The Yang Chi Tzu is the largest in size; its average weight reaches 60 grams while its circumference is 7.85 mm. The Yu Chi Tzu is about the same in size as the K'ou-wai Ch'ai Chi Tzu. Their average weight is about 50 grams, and the circumference, 7.07 mm. The Fu-ti Ch'ai Chi Tzu is the smallest weighing only 35 grams and being about 6.27 mm. in circumference.[3]

The shell conditions of these eggs are also different. In colour, the Yang Chi Tzu is generally white, the Yu Chi Tzu and K'ou-wai Ch'ai Chi Tzu, light brown, while the Fu-ti Ch'ai Chi Tzu ranges from white to dark brown. With the exception of the Yang Chi Tzu, eggs are usually marketed with dirty shells. This is generally due to the fact that eggs, before being sold, are often preserved under the earth by

[3] Cf. Roberts, E. and Hunter, J. A. *Size of Chinese and American Breeds of Chickens and Eggs. Peking Natural History Bulletin*, 1934-35. vol. 9, Part 2, pp. 83-92.

farmers in order to keep them cool to prevent deterioration. Unfortunately, they ignore the fact that the dampness of the earth not only causes dirty shells but also imparts a musty flavour through the pores of the shell.

Dr. L. C. Kung, a food chemist, of the Department of Chemistry of Yenching University found in one of her experiments the composition of the three types of eggs as follows:

Approximate Composition of Egg Samples
Purchased Fall, 1936.

Kind of Egg	Moisture	Protein	Carbohydrate	Fat	Ash
Fu-ti Ch'ai Chi Tzu	71.9%	13.3%		12.3%	1.07%
K'ou-wai Ch'ai Chi Tzu	72.3	13.3		12.0	1.01
Yu Chi Tzu	72.5	13.9		10.8	0.98

From this result, we can see that the differences are not significant. It is, however, interesting to notice that the Yu Chi Tzu, meaning the Oil Chicken Egg, is the lowest one in fat content. This is perhaps due to the fact that the hen itself retains too much of the fat.

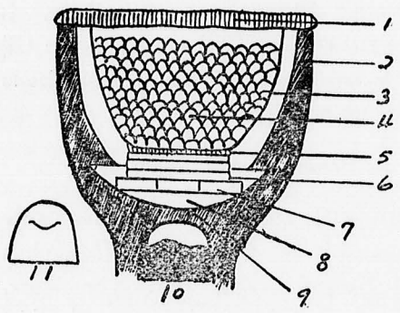
d. *The Chick: Its Production and Supply*

Natural hatching is not usual in this area. The chicks are mostly supplied by native hatcheries situated in Jen Chia Chuang (任家莊), a village about 15 *li* northeast of T'unghsien (通縣) city. The village, having specialised in hatching for almost 120 years, is known as the chief source for the supply of chicks as well as hatching specialists. According to the record we have for 1935, there were 29 hatcheries in the village

[4] See p. 348

supplying 1,878 thousand chicks[4] to an area 150 *li* in radius from the illage.

The hatching is done during the short period from about Ch'un Fen (春分) or Ch'ing Ming (清明), i.e., about March of every year, to Hsia Chih (夏至), i.e., about May of every year, a period of a little over 60 days. The eggs are bought from country egg collectors who, usually travelling from village to village to purchase eggs from the poultrymen, are trusted to be able to distinguish the fertilized from the unfertilized eggs. The purchase is made under a contract that all those delivered must be totally fertilized. Actually, however, as no proper method of distinguishing is applied, the delivery generally includes about 20% unfertilized eggs. The price paid is thus about 5% higher than the ordinary rate. The number of eggs that are bought by each hatchery has to depend on the size of the enterprise which is in turn determined by the number of jars it possesses. The jar, specially constructed for the purpose, is made of earth with a caldron at a place about 8" above the bottom which is hollowed for heating purpose. (Fig. 1) One that



1. The covering
2. The jar
3. The basket that holds eggs
4. The eggs
5. The straw platted plate
6. Earthen cakes
7. Bricks
8. Sand
9. The caldron
10. Charcoal
11. The shutter for the fireplace

Fig. 1. The Arrangement of a Hatching Jar

owns 18 jars is counted a large unit, that having 14 jars, a medium one, and that with 9 jars is the smallest. Each jar can hold 1,500 eggs and

generally ten settings are made within one hatching season. It takes two jars to complete one setting, so, taking a large hatchery as an example, it needs to be supplied with at least 130 thousand eggs a season.

The work ground is but an ordinary house. The main implements include the jars and two shelves, an upper and a lower. The shelf is placed in the middle of the house stretching from one end to the other and the jars are set in a long line against the walls. A large hatchery with 18 jars as a rule occupies 3 *chien* (rooms), a medium one, 2 *chien*, while a small work ground consists of only one *chien*. (Fig. 2)

1. Jars
2. Shelves
3. Poles to hold the shelves
4. Poles
5. Holes
6. Strings to attach the horizontal poles to the vertical ones
7. Walls
8. Ground
9. Doorway

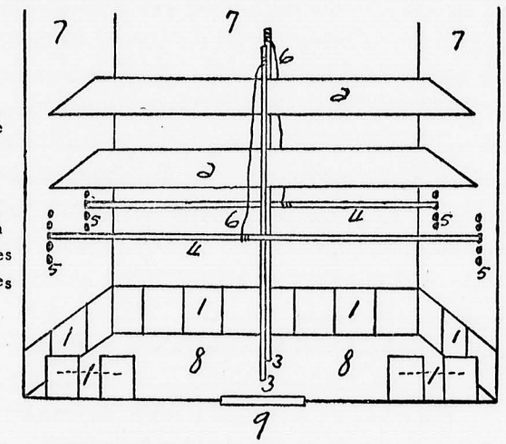


Fig. 2. The Arrangement of a Hatchery.

Each of the hatcheries is individually owned, the owner being in most cases the Ta shih Fu (大師傅) also, that is, the chief technician, who directs and supervises the work. He is assisted by the Er Shih Fu (二師傅), the assistant technician, and 1 to 3 workers, depending on the size of the enterprise. These assistant workers, if hired, are paid in money—the Er Shih Fu receives $50 and the workers receive $30 for

the whole season. If they are family members, they receive no regular salaries but share what they make as profit.

The work begins by placing the eggs into a basket, after which the baskets are placed into the odd number jars, i.e. the first, third, fifth, and so on. The jars are heated by charcoal to a temperature of about 103° F. The temperature is regulated by increasing or decreasing the fuel in the hollowed bottom, or opening or shutting the shutter at the opening to the fireplace. The eggs are taken out to be put into the even-number jars on the sixth day. These eggs are again removed on the eleventh day to the upper shelf and covered with cotton coverings to maintain the temperature. On the fifteenth day, they are moved from the upper shelf to the lower where they are kept for another five or six days until they are hatched. Therfore, it takes about 21 days to finish one setting, and as a new setting can be started every five days, ten settings can be made within one hatching season. Not all eggs are hatched, the hatching rate approximating to 65% only. So, computing on this basis, a large hatchery can supply 84,500 chicks a season, that is to say each pair of jars supplies 9,300 chicks a season. The 29 hatcheries owned about 400 jars in 1935, so a total of about 1,878,000 chicks were hatched in Jen Chia Chuang that year.

The chicks are distributed through the country egg collectors, the same persons who supply the hatcheries with eggs. They receive chicks from the hatchery and carry them to the poultrymen for sale in cash. They are connected with the hatchey either as wholesalers, as commission salesmen, or as retailers. In practice, the wholesaler sends an order to the hatchery before the hatching begins. After the order is acknowledged by the seller, the two parties decide on a price which is to be observed throughout the whole season. Then the agreement is made formal, the buyer paying a part or the whole of the price. The

commission salesman is bound to the hatchery by a contract, in most cases an oral contract only, which defines only vaguely the obligations of the two parties, i.e., the merchant has to sell only for the contracted party throughout the season, while the hatchery has to supply within its capacity any quantity the other party demands. The price, in this case, however, is not fixed beforehand, but fluctuates according to the market. The difference between the wholesale and the retail prices makes up the commission. The duties of a retailer are just like an ordinary purchaser and need no detailed description.

The price of the chick varies not only according to the seasons but also according to the ways it is sold. The price charged to the wholesalers being a fixed price, is usually lower than that charged to the commission salesmen and retailers, as the fixing of the price by the buyer and the seller practically takes place before hatching begins at the time when the producer is in need of capital. In 1935 the price was $15.00 per thousand heads. The price, again, fluctuates in different places where they are sold. Table I shows how chick prices vary in different seasons and at different places.

Table I.

Prices Per Thousand Chicks and Profit Made from Chick Sales. Spring, 1935.

No. of Settings	Wholesale Price	Retail Price (T'unghsien & Neighborhood)	Profit		Retail Price (Kalgan)	Profit	
			Amount	%		Amount	%
1 & 2	$20.00	$41.70	$21.70	108.5	$56.50	$36.50	182.5
3 & 4	18.00	31.00	13.00	72.2	47.80	29.80	165.5
5 to 8	16.50	17.00	0.50	3.0	21.80	5.30	32.1
9 to 10	15.50	17.00	1.50	9.7	21.80	6.30	40.7

The above table also indicates the profit made by dealers. The dealers travel from village to village and sell chicks directly to the poultrymen, so there is no transportation expense. Feed for the chicks is the only expenditure that the dealers bear. Besides, they may sometimes bear a depreciation of half of the selling price if they have kept the stock too long, as it is felt that the hens, if kept too long in the cage, will decrease in their productive capacity.

An attempt has also been made to analyse the balance sheet of this industry. However, as these old type farms had kept no accounts at all, or, even if some did, the accounts were not complete enough to furnish accuracy to any extent, we have to make up one on the basis of the material we have collected from different sources, Table II gives such a summary for a hatchery that has 18 jars.

Table II.
Annual Statement of Receipts & Expenditures of
An Eighteen-Jar Hatchery.

Receipts		$1,930.95
Sales of chicks (in 3 ways)	$1,566.76	
Sales of partially incubated eggs	364.19	
Expenditures		1,866.50
Eggs (130 thousand eggs, $12 per thousand)	1,560.00	
Charcoal (3,000 catties, $3 per 100 catties)	90.00	
Repair and Renewals (total cost of implements $140.00)	14.00	
Wages (1 Erh Shih Fu, 3 workers)	140.00	
Interest (at 25% per annum, for 2 months only)	62.50	
Surplus		$64.45

The above calculation, though not unsound, may be unreal. The whole statement is made up on most inadequate information, and the expenditures may be overestimated while the receipts may be too small.

Moreover, as has been mentioned, the industry is usually a family business and workers are mostly family members. Thus, like other family industries, workers may draw no regular pay; this leaves a still larger margin for surplus. We were unable to trace back the trend of the trade because of lack of reliable records. However, it is said that during the political distress which has occurred there during these years the trade has declined to an extent not met before. This is quite possible.

PART II. MARKETING

a. Surces of Supply

Formerly, the Peiping area received eggs for distribution from an area as far as from Shantung and Honan in the south, Shansi in the west, and Suiyuan in the north. Lately, eggs produced in Shantung and Honan have found new markets in Tsingtao and Hankow respectively, because these two cities have recently become important egg exporting ports. Eggs produced in Hopei, especially the northern part of the province, undoubtedly comprise the chief supply of Peiping and Tientsin, and in addition to this, supplies from Suiyuan and Charhar also occupy a not unimportant part, while those from Shansi are negligible. (See Fig. 3)

The amount produced in this area as described above cannot be exactly determined. To take the Hopei province only, production for 1935 may be estimated at 1,090 million eggs. This figure is based on the returns collected in that year of the number of fowls in the province[5]. Fowls totalled about 13.5 millions, and of these, there were about 9 million hens that can produce eggs. On an average annual production of 120 eggs per hen, the total production would possibly reach the above estimation. Of these eggs, only a small portion is consumed by the local populace; the greater part is marketed to either Peiping or Tientsin, depending on the cost of transportation and the price offered.

[5] The Agricultural Research Bureau of the Ministry of Industry, *Crop Report*, Vol. 4. No. 4., April, 1936.

Small old-type egg plants are also found in some parts of the province. They may buy eggs from local makets and have them processed. These products are all shipped to Tientsin for exportation.

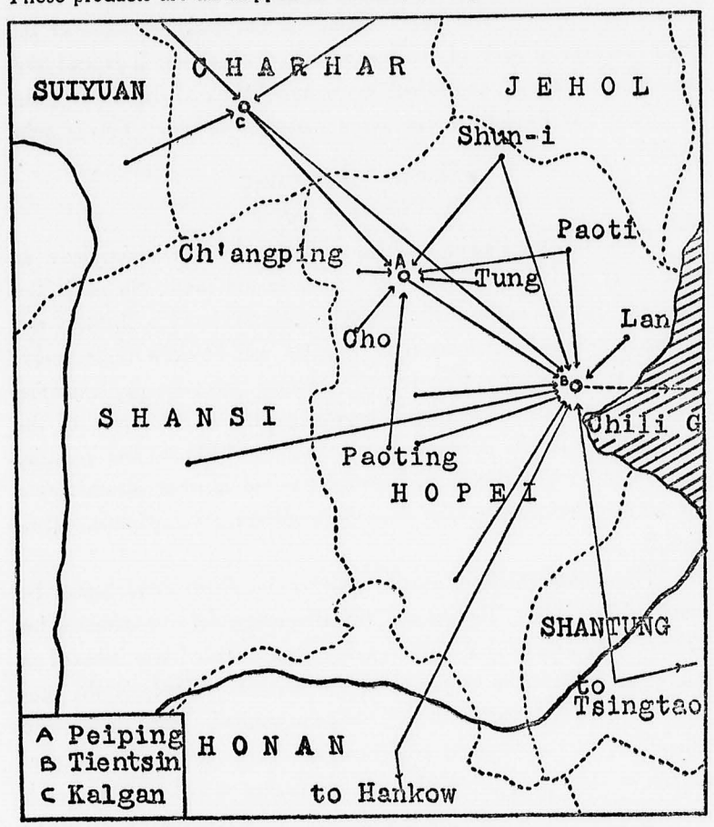


Fig. 3 Map Showing Sources of Egg Supply to Peiping and Tientsin.

b. The Market Organization

The egg markets in this area, as markets of other commodities, fall into four categories: the primary or local market, the intermediate

market, the final or central wholesale market, and the retail market. All transactions between the country egg collectors (He Chi Tzu Ti 喝雞子的) and the poultry farmers are defined here as the local market, therefore there is actually no definite locality for such market, or in other words, such market can take place at the door of any poultry farmer's house, for the business transaction as a rule is done on the spot where the chickens are raised. This market serves chiefly as an assembling centre. The intermediate market is the connection between the local market and the central wholesale market; it receives eggs from local markets and ships them to the final ones. In this market, there are different kinds of egg dealers who may be roughly classified into two types according to the nature of their business organization: those who collect from the country egg collectors at local egg fairs are called Hsiang Fan (鄉販); the country dealers and those who have agents of their own at suitable points in the country where the country egg collectors deliver their collections are generally known as P'i Fa Shang (批發商), the wholesale merchants. The small old-type local egg plants and the buying agents established by the large modern egg plants of Tientsin also fall into this category, although the former process the goods locally and ship them to Tientsin for exportation. The central wholesale markets are located both in Peiping and Tientsin. The egg inns are the main organizations in this market. They serve as a meeting ground of sellers and buyers and, consequently, the owners of the inns act as brokers for the sellers who have come from the country, so are not acquainted with the conditions of the market. The egg inns in Peiping and Tientsin are not identical in function—in Peiping these inns serve only as brokers, while in Tientsin they serve besides as a tax collecting agent for the local authority. The retail market comprises egg sellers of many kinds and also other merchants: owners of restaurants, hotels, the preserved egg shops, and bakeries in both cities. However, the egg transactions in this area do not necessarily go through all these four markets step by step as described above. The country collectors near the city may carry what they have collected directly to the retailers, or sometimes even to the consumers for sale, while some whole-

salers who have shops both at the collecting points and the city may sell directly to the retailers without going through the inns as in Peiping. The channel of distribution of this product may well be illustrated by Figure 4.

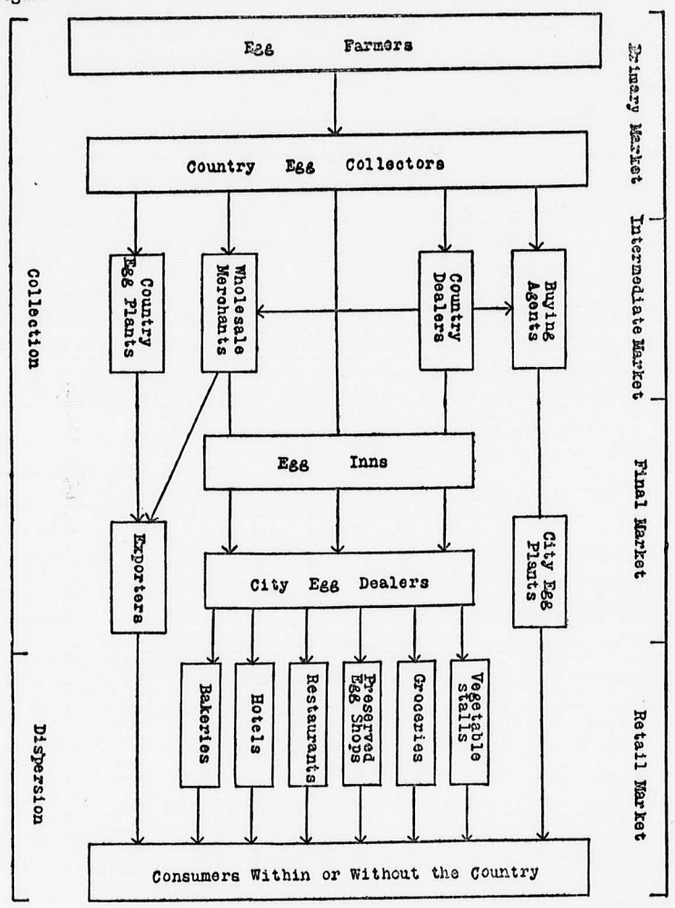


Fig. 4. The Market Organization of Egg Trade in Peiping and Tientsin.

The character and function of some of these middlemen in the channel of distribution will need further description as follows:

He Chi Tzu Ti (喝雞子的). This is the name given by the egg farmers to the country egg collectors. They are traveling buyers who go from village to village to collect what they see profitable to buy. These egg buyers usually change their business from time to time, but in busy seasons, they stick to the buying of eggs throughout. They visit the farmers once in one to two weeks on the average. Each time, after he has collected an amount enough to make one sale and not over the weight he can carry over his own shoulders (about 800 eggs), he will go to the nearest fair, or local egg plant, or the buying agents established by either the large egg plants of Tientsin or the wholesalers of the final markets. Those dwelling near the city may bring the product to it and peddle directly to the retailers and/or the consumers. They buy the eggs outright from the farmers, so they have to furnish capital of an adequate amount for payment of the goods. It was once common for the capital to be supplied by some large collectors, viz., the wholesalers and egg plants of old and modern types. Under this practice, the price paid to the farmers should be according to a pre-fixed scale set by the supplier of the capital. At present, this practice has been abandoned due to the fact that these small traders can seldom fulfill the contract.

Hsiang Fan (鄉販) or *Country Dealers*. These merchants are one of the chief assemblers in this trade who generally buy eggs from the country collectors in local fairs. One of these fairs we have studied is located at the west gate of Yen-chiao (燕郊), a marketing town in T'unghsien. This fair is held on the 1, 4, 6, 9, 11, 14, 16, 19, 21, 24, 26, and 29 day of each of the lunar months. It serves quite an extensive area including T'unghsien itself and the neighboring districts like San-ho (三河), Shun-yi (順義) and Hsiang-ho (香河). It opens

early in the morning as soon as the sun rises and closes about noon. The business transactions begin by direct open bargaining between the buyers and sellers. When an agreed price is reached, it is announced and is observed by every transaction througout the day. Payment must be made in cash. The total turnover commonly falls between the limits of 30 to 40 thouand eggs per market day. Each country dealer generally pools together all the eggs he has purchased from different sellers and sends them by donkey to the central market. A load is made up of two basketsful of eggs, each containing at the most 700 eggs. The donkey is the only means of transportation, so each dealer must own one or two of these animals, but the number seldom exceeds three. The dealer travels with the animal for one or two days, sometimes even for three days, depending on the length of the distance to the central market, so he is present personally at the market, though there is always a broker acting for him.

Chi Tzu Tien (鷄子店) and *Chi Tzu Hang* (鷄子行). These are the inns where the country dealers unload their package. They are called Chi Tzu Tien in Peiping and Chi Tzu Hang in Tientsin. In Peiping, these inns serve the dual function of providing the country dealers living quarters, and acting as a connecting link between this group as sellers and city buyers; while in Tientsin, they have an additional function, i.e., serving as a tax collecting agent for the local authority. At present, there are 7 such inns in Peiping, namely, Wan-t'ai-tien (萬泰店), Ch'ing-chia-tien (慶家店), Tung-chang-tien (東張店) and Ma-chia-tien (馬家店) at Te-sheng-men (德勝門), Tung-lai-tien (東來店) and Te-shen-tien (德陞店) at Tung-chih-men (東直門) and Wang-chi (王記) at Ch'ao-yang-men (朝陽門); and four in Tientsin situated in Liang-chü-tzu (梁咀子), Pei-ying-men (北營門), Hsiao-wang-chuang (小王莊) and Ch'ien-te-chuang (謙德莊) outside of the concession. The inn generally has a manager (usually the inn-keeper), a clerk and one to five assistants. In smaller inns, the manager

is usually the clerk, while in Tientsin, being also a tax collecting agent, there is more than one clerk whose work is heavier there. The country egg dealers arrive at the inns from one to two o'clock p.m., so the buyers usually do not appear before these hours. After the comers settle down, the manager fixes a price, in terms of the number of eggs per dollar, to the satisfaction of both parties. All business on that day is done at this price but a slight variation may be allowed for the quality of the goods. On the same day throughout the market the price is quite uniform, as the buyer who has paid a higher price in one inn is allowed to demand a make-up the following day. The transaction is made in bulk, only the very old or broken ones can be picked out from the load. The negotiation is made by the buyer and the seller directly. When the two parties have arrived at a final agreement, the manager and his assistants count out the number of eggs in the basket and the clerk calculates the money price for them. As soon as the deal is transacted, the manager pays the seller in cash. From the payment the price of two eggs is deducted from every dollar's worth as commission; this is a commission rate of from 1.6 to 4%. The buyer should pay back the manager immediately, but usually credit is extended to the regular buyers to be cleared at the end of each month. The practice in Tientsin differs in two ways. In the first place, the price is fixed by the sellers and buyers themselves. Secondly, the transaction can be completed only after an official certificate is issued to the seller by the clerk in charge indicating that the proper tax, of 3% at present, has been paid. The buyer bears the tax. As a result of their responsibility for tax collection, the Tientsin egg inns frequently send inspectors out to the districts in the vicinity to stop smuggling. However, their jurisdiction cannot extend over to the foreign concessions.

The Buying Agent of the Egg Plant. Egg plants in Tientsin customarily send representatives out to establish buying agents at important local shipping points. The volume of trade carried by these

agents amounts to a considerable figure. Usually, they are active only from March to August each year when egg production is richest. Among these agents, those established by the International Export Company are decidedly the most predominant. They obtain eggs of all kinds from the local collectors and sometimes even from the city wholesalers who have a surplus. Egg transactions here are classified into three grades according to their size. Fig. 5 shows the sizes of the measurement used by the International Export Company. These agents receive

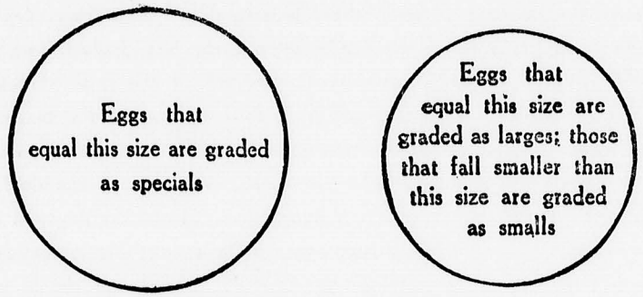


Fig. 5. Sizes of the Measurement used by the International Export Co. for the Purchase of Eggs.

instructions from their firm as to the price, the amount of purchase and other related items. As the amount of their purchase is usually so overwhelmingly large, the price set by them generally rules the neighbouring markets. According to what we have learnt, the International Export Company bought 100,000 eggs daily from T'unghsien, and nearly 80,000 apiece from other minor places. The eggs are shipped directly to their respective firms in Tientsin.

Wholesale Merchants. According to the size of business turnover and the character of the organization of the firm, these wholesale merchants fall into two classes: the Chi Luan Kung Szu (鷄卵公司), the egg Company, and the Chi Tzu Chuang (鷄子莊), the Egg Shop. Like the buying agents retained by the egg plants, they have shops established at important points, to which the country collectors deliver the eggs at a price fixed between them. Sometimes, these wholesalers may also go to local fairs to buy eggs as the country dealers do. The egg companies are better organized in handling the operation of the trade. They pack the eggs in either boxes or baskets, the box holding 910 eggs and the basket, 2,400 eggs. These packages are transported by railway to the final markets and usually unloaded in the warehouses of the railway station at its destination. The transactions generally take place in the warehouses. As soon as the goods are unloaded, the company notifies its customers in the city to inspect the goods in the warehouse in bulk. If they satisfy the buyer, the goods will be traded, either in box or basket loads, according the prevalent wholesale price. In case there is any deficiency in numbers of the content, the company is reponsible to make it up, but no replacement is made for breakage and deterioration. The operations of the egg shops are simpler. They ship the eggs by all means of transportation but the railway, so they have to establish shops in the final markets as trading centers. Cash trade is the general principle for the wholesale trade, though credit on a monthly basis may occasionally be extended to familiar customers. The operation of this group in Tientsin is somewhat different. The shipment must go through the egg inns unless it is made to the egg plants or exporters in the foreign concession. In this latter case, the eggs are to be unloaded in the godowns of the plants or exporters. If it is a sale by contract, the delivery is to be received by the buyer according to the stipulated terms. If it is a consignment sale, the goods also go first to a certain godown, then a commission man will act for the seller, send samples to all possible buyers and make a bargain. The owner of the godown where the goods are unloaded, however, commonly retains the privilege of purchase.

Luan Fan (卵販) or *the City Egg Dealers.* These city dealers are scattered all over the city of Tientsin and Peiping. They buy from wholesalers or country dealers and sell to all kinds of retailers as jobbers[6] —sometimes they are also retailers. The transaction is customarily made by contract which states the quality of the egg, the date of each delivery, and the number to be delivered each time. The contract is of two kinds. One kind, which is the more rigid, stipulates, besides the general terms, exactly the price to be observed througout the period when it is effective. Such a contract is usually made during the time between the festivals of the fifth and eighth moons (端午至中秋) when the egg price is at its lowest. Under this contract, the buyer makes a total payment in advance for all the eggs that he contracts to buy. The seller, in turn, is liable to fulfill all the stipulated terms. The other kind of contract does not fix a rigid price, but fluctuates according to the existing scale. The buyer, under this contract, pays for each delivery separately. Moreover, there is no time limit for such a contract; it can expire at any moment if either side wants to discontinue it for any reason.

Retailers. The retailing of eggs for the consumption of the local population in Peiping and Tientsin is carried on by various merchants. The largest class of them is undoubtedly that of the grocers dotted all over the two cities. The turnover of each grocery ranks from ten to a hundred fresh eggs daily. The vegetable stalls in markets also sell a considerable number. The preserved egg shops are another class of large retailers. Peiping is specially known for its preserved eggs, and they are marketed as far as Kwantung and Manchuria. Four of the largest of these shops in Peiping marketed approximately 8,500,000 preserved eggs during 1931-35. Bakeries, restaurants, hotels, and school

[6] A jobber is a dealer who buys from first-hand receivers or from the country and sells to retailers of all kinds.

and hospital kitchens are other important retailers.

c. *Grading.*

There is no more important marketing process than that of grading. The purpose of grading is to sort produce into mutually exclusive groups according to certain standards of quality, so as to increase its marketability and consequently to reduce its cost. This does not only aid the seller, but also leads to considerable saving of time and effort on the part of the buyer, whether distributor or consumer, as it makes inspection by the buyer unnecessary. According to Clark and Weld, the advantages that both transportation and financing of marketing products are facilitated, are added.[7] Thus grading has become one of the most important measures that governments of various countries have attempted recently in the improvement of marketing facilities. Grading is more important to the marketing of agricultural products as they are mostly very bulky, and sale by inspection is most troublesome and tiresome to the buyer. The egg, as an agricultural product, has also been subject to treatment in this way, although grading of eggs is a comparatively recent development.

Eggs are now generally graded, in addition to the perliminary weeding out of cracked and dirty specimens, as to (1) colour, i.e., into brown, white and mixed samples, (2) weight, (3) freshness. So far as marketing of eggs in the Peiping area is concerned, none of the above standards has been followed. In the case of Peiping they are mainly classified exclusively according to the source from which they come, i.e., those supplied by districts north of Kalgan are called K'ou-wai Chi Tzu (口外鷄子) and those from districts south of the same city are called Fu-ti Chi Tzu (伏地鷄子). In retailing markets, the Fu-ti Chi Tzu are

[7] Clark, F.E. and Weld, L.D.H., *Marketing of Agricultural Products in the United States.* pp. 355-358.

further graded into three classes according to size, the No. 1 (I-hao 一號) is equal to the size of K'ou-wai Chi Tzu, the No. 2 (Erh-hao 二號) are comparatively smaller, while the smallest are named No. 3 (San-hao 三號). This classification is obviously very crude, for there are no accepted standards. The case of Tientsin is slightly different. They are mainly graded into "larges" (Ta-hao 大號) and "smalls" (Hsiao-hao 小號) as the Tientsin retailing market receives K'ou-wei Chi Tzu only in small, and thus unimportant quantities. That such a difference is only one of name but does not change the fundamental principle is obvious.

d. Transportation and Packing

The carriage of eggs in this area is very much split up. Bulk transport seems never to have proved advantageous to dealers of this product yet. This is chiefly due to two causes: first, combination of any aspect has never been followed by the merchants, and, secondly, the means of transportation for this product is generally so simple and primitive and the load so small, that bulk consignment is nearly impossible.

Eggs in this area are chiefly carried by human labor, donkey, or rickshaw for short distance transportation. For long distances, carriage by boats or mule-carts is most common, while railway transportation is only occasionally used by large wholesalers when eggs are sent from Kalgan or points beyond that city, or from districts in Southern Hopei.

Carriage by human labor is the most usual way of transporting eggs for distances within a day's journey to the destination. Eggs are packed in two willow baskets, each containing 400, filled with soft hay in order to prevent cracking. The carrier carries them on his shoulder by fastening them on each end of a long pole. As the carrier is himself the

dealer, so the cost for such kind of transportation includes only what he spends for his own food which does not usually exceed 20 cents a day.

For larger loads, a donkey is usually used. Wooden boxes, in this case, are employed to hold the eggs instead of baskets. Each donkey can carry two boxes containing 1,500 eggs. The animal is as a rule owned by the dealer. Each dealer owns generally one animal, sometime two, but seldom more than two. The total daily expense for a team (a donkey and a man) amounts to 35 cents, of which about 40 % is spent for the animal. If an over-night stop should be made, a 3 to 4 cent inn expenditure should be added.

The rickshaw is only employed for transporting eggs from T'ung-hsien to Peiping, a distance of about 45 *li*. One rickshaw can load 3,000 eggs, packed into 6 boxes. The usual rate of fare is 60 cents for one journey. Adding 20 cents for the dealer's expense who must travel with the load, the total cost will be 80 cents.

Water transportation is common in shipping points where there are rivers. The Grand Canal and the Hu T'o Ho (滹沱河) are the most frequently used waterways for egg shipments in this area. The cost varies violently according to the convenience or inconvenience of handling the cargo, and whether an agreement has been secured beforehand between the shipper and the boatman. According to the experience of the International Export Company of Tientsin, only 5 cents are paid for shipping a case of 500 eggs from T'unghsien to Tientsin through the Canal, while 12 cents are paid for shipping the same case from Su-chuang (蘇莊), Shun-i Hsien (順義縣), to Tientsin, a distance about one third shorter than that from T'unghsien to Tientsin, and a still higher freight rate (18 cents) is charged for shipping from the Niu-lan-shan (牛欄山), Shun-i Hsien, to T'unghsien.

The freight charged by mule-cart transportation is on the whole higher than that by water. The charge is 15 cents from Hsiang-ho Hsien (香河縣), and 20 cents from Pao-ti Hsien (寶坻縣), to Tientsin per every 500 eggs. Moreover, to ship by this means usually causes a larger rate through breakages because roads are very rough. Therefore, only in winter when waterways are frozen or in districts where waterway shipment is impossible, transportation by mule-carts is employed.

The employment of the railways for shipping eggs is increasingly adopted by wholesale dealers and local egg plants who send eggs from long distances, such as from Kalgan and Southern Hopei to the two final markets. According to the regulations of the Ministry of Railways, eggs are classified as a Grade 4 commodity, the charge is $11.00 per ton from Kalgan to Peiping and $19.00 to Tientsin. The latter rate is higher than the former in proportion to distance, because shipments made to Tientsin involve more trouble in handling the freight from one (the Peiping-Suiyuan Railway) over to the other railway (the Peking-Mukden Railway). Eggs shipped by freight are packed in baskets, each containing 2,400 egg and six basketsful of eggs weigh a ton. A different scale is applied for the shipment of egg products, e.g. $24.00 per ton from Kalgan to Tientsin.

Careless packing is the main problem of egg shipments in this area. As often the case is not properly filled with soft packing, cracking and smashing are inevitable. Furthermore, as the responsibility for damage does not fall on the shipping concern, eggs are usually not carefully and properly handled. Lastly, because the same filler is used over and over many times, the accumulated dust usually soils the eggs and causes black stains on the shell.

Table III summarizes the different scales of transportation cost for eggs from various districts.

Table III. Transportation Cost for Shipping 1,000 Eggs from various Points to Peiping or Tientsin, 1936.

Direction of Shipment	Means of Transportation	Transportation Cost										Total
		Freight rate		Package		Warehouse		Taxes*		Damage		
		$	%	$	%	$	%	$	%	$	%	
T'unghsien to Peiping (1 day journey)	Human labor	0.25	59.53	0.02	4.76	—	—	—	—	0.15	35.71	$0.42
,, ,, ,,	Rickshaw	0.27	61.36	0.02	4.55	—	—	—	—	0.15	34.09	0.44
Huai-lai to Peiping (3 day journey)	Donkey	0.90	63.38	0.02	1.41	—	—	0.30	21.13	0.20	14.08	1.42
T'unghsien to Tientsin (2 day journey)	Waterway	0.15	46.87	0.02	6.25	—	—	—	—	0.15	46.87	0.32
Hsiang-ho to Tientsin (1½ day journey)	Waterway & Mule cart	0.25	40.32	0.02	3.23	—	—	0.15	24.19	0.20	32.26	0.62
Pao-ti to Tientsin (1½ day journey)	Mule cart	0.43	66.15	0.02	3.08	—	—	—	—	0.20	30.77	0.65
Kalgan to Peiping (2 day journey)	Railway	0.78	59.09	0.05	3.79	0.04	3.03	0.30	22.73	0.15	11.36	1.32
Kalgan to Tientsin (3 day journey)	,,	1.35	71.48	0.05	2.66	0.04	3.13	0.30	15.82	0.15	7.91	1.89
T'ao Hsien to Peiping (2 day journey)	,,	0.73	75.26	0.05	5.16	0.04	4.12	—	—	0.15	15.46	0.97

*Taxes are levied on eggs as Hsiang-ho Hsien (香河縣) and Chu-yung-kuan (居庸關) in Ch'ang-p'ing Hsien (昌平縣).

e. *Export of Eggs and Egg Products*

Notwithstanding the belief that Chinese exportation of eggs to foreign countries began as early as the end of the eighteenth century, records for Tientsin export can be traced back to 1904 only. For that year the total value of egg export from that port was only 6,700 H.K. Tls. From then on, its export value increased by leaps and bounds; it was 120,000 H.K. Tls. for 1910 and 1,140,000 H.K.Tls. for 1915—an increase of 19% and 170% respectively. The Great War in the following year stimulated the egg trade of the Far East and as a result the total value of egg export from Tientsin was further increased by 46% of the previous year's standard, thus its place in the national egg export trade was firmly established. It became then one of the three important egg exporting ports in this country, the others being Shanghai and Hankow.

Table IV. Export of Eggs and Egg Products from China and Tientsin (1905-1934)

Year	China	Tientsin	Percentage of Tientsin Export to the Total Export
1905	2,021,589 H.K.Tls	7,864 H.K.Tls	0.31 %
1910	4,000,089	121,714	3.04
1915	8,426,286	1,147,044	13.61
1916	12,331,477	2,236,814	18.17
1917	14,318,070	1,905,548	13.31
1918	11,053,315	1,162,334	10.52
1919	24,932,494	2,940,559	11.79
1920	21,457,401	2,316,035	10.79
1921	24,697,199	3,944,018	15.97
1922	29,955,239	3,835,755	12.81
1923	29,621,994	5,188,997	17.48
1924	31,523,164	5,909,853	18.75
1925	33,012,530	5,977,078	18.11
1926	38,173,830	5,695,290	14.92
1927	33,526,302	7,877,991	23.50
1928	43,779,041	5,842,659	13.35
1929	51,719,803	9,564,301	18.49
1930	51,160,972	8,714,818	17.03
1931	37,757,544	12,124,459	32.11
1932	28,408,915	8,001,367	28.16
1933	$36,479,624	$10,118,746	27.74
1934	30,863,526	8,603,136	27.87

Table V. Classification of the Expprt of Eggs and Egg Products from China and Tientsin, 1930-34.

Years	China or Tientsin	Units	Dried Egg Products			Moist & Frozen Products			Shell Eggs*	
			Albumen	Yolk	Mixed	Albumen	Yolk	Mixed	Fresh	Preserved
1930	China	piculs	56,886	69,922	17,305	17,305	194,266	336,430	602,311	14,008
		H.K.Tls.	5,117,214	4,463,225	1,389,464	1,615,160	7,416,440	21,913,553	8,985,282	260,534
	Tientsin	piculs	23,324	41,341	508	2,238	18,557	59,441	82,129	1
		H.K.Tls.	2,239,104	2,149,732	31,465	50,267	454,267	2,674,845	1,108,742	16
			43.75%	48.17%	2.26%	3.11%	6.13%	12.21%	12.34%	
1931	China	piculs	47,506	56,369	10,272	77,323	173,719	629,337	594,391	16,935
		H.K.Tls.	4,393,237	3,817,259	824,369	1,711,626	4,218,331	15,510,639	6,928,979	353,106
	Tientsin	piculs	18,115	31,692	73	20,153	35,555	166,102	131,889	16
		H.K.Tls.	1,774,616	2,098,031	5,819	443,366	839,887	5,429,366	1,532,848	320
			40.39%	54.96%	0.71%	25.90%	19.91%	35.00%	22.12%	
32	China	piculs	43,142	39,648	10,313	60,342	153,247	588,514	341,797	14,090
		H.K.Tls.	5,414,883	1,919,718	437,916	1,224,855	3,403,338	12,019,956	3,771,325	216,924
	Tientsin	piculs	15,761	22,703	260	13,114	49,024	117,456	65,457	23
		H.K.Tls.	2,296,347	1,029,989	21,493	68,121	1,052,714	2,592,348	720,069	268
			42.41%	53.65%	4.91%	23.52%	30.93%	21.57%	19.09%	
1933	China	quintals	23,398	34,013	4,024	38,043	88,931	292,516	339,267	15,395
		dollars	8,320,141	1,974,921	595,215	1,898,501	3,517,535	11,486,293	5,616,476	370,542
	Tientsin	quintals	16,763	34,531	203	14,129	39,450	76,049	75,632	101
		dollars	3,814,082	1,180,017	17,724	484,244	887,283	2,624,984	1,109,158	1,254
			45.84%	59.75%	2.98%	25.51%	25.22%	22.85%	19.75%	
1934	China	quintals	25,682	35,744	2,953	22,940	77,035	338,303	304,903	14,624
		dollars	7,619,131	1,617,789	423,859	862,239	2,886,932	12,892,231	4,233,770	327,575
	Tientsin	quintals	13,128	25,879	453	3,845	21,468	50,333	103,373	16
		dollars	3,965,562	1,154,959	53,121	127,976	552,526	1,646,601	1,101,898	493
			52.05%	71.39%	12.53%	14.84%	19.14%	12.77%	26.03%	

*unit = 1,000 eggs.

The development and importance of the Tientsin egg export trade can be seen from Table IV giving figures of their value for both the country and the port. Both trends show an upward movement, but that of Tientsin ascends more rapidly in proportion than the other. The proportion of Tientsin in the nation's total export value was very insignificant at the beginning, less than 1% of the total trade. It rose to 3.04% in 1910, 13.61% in 1915, 15.97% in 1921, 23.50% in 1927 and 32.11% in 1931. Although the share of Tientsin export seemed to have declined since 1931, it would be still fairly accurate to state that of later years it exports annually at least one quarter of the total trade value. The actual value of Tientsin trade gives a still happier view. Besides the figures we have given in the above for 1905, 1910 and 1915, it increased to 3,944,018 H.K.Tls. in 1921, to 7,877,991 H.K.Tls. in 1927, and to 12,124,459 H.K.Tls. is 1931.

A more detailed analysis of the Tientsin egg export trade is given in Table V for the period of 1930-1934. The export in this table is recorded under three classifications—the dried egg products, the moist and frozen egg products, and shell eggs. The first two classifications are subdivided into the albumen, the yolk, and the mixed. The shell eggs are also further classified into fresh eggs and preserved eggs. In each classification, both the amount and the value of the export for both China and Tientsin are given. The columns on the percentage of the Tientsin export to the total export is computed on the value basis. These computations show that Tientsin exported over half of the total value of dried yolk of the country as a whole, i.e., 48,17% for 1930, 54.96% for 1931, 53.65% for 1932, 59. 75% for 1933 and 71.39% for 1934. Dried albumen ranked second to the dried yolk with the following percentages—43.76, 40.39, 42.41, 45.84 and 52.05—for the respective years of the same period. Tientsin has not occupied an important place in the exportation of fresh eggs. This is due to two reasons: first, there are a few well-equipped egg plants in the city, so processing of eggs can

be conveniently completed; and secondly and more fundamentally, shell eggs supplied by this area can hardly complete with foreign standards.

Tientsin exports a greater part of its eggs and its products to Great Britain, then follow in order, the United States, Germany, France and Japan. Great Britain is a big consumer of moist and fresh eggs, America consumes chiefly the dried albumen, while Germany imports most of the frozen yolk.

Tientsin export of eggs and its products is chiefly through foreign firms situated in the concessions of the city. These plants are mostly equipped with modern power machinery, and manufacture on a large scale. The International Export Company is the largest of them. Once it employed about 200 workers and produced every day 3,000 piculs of different egg products. Local plants in the remote parts of the province supply the rest of the export. These plants are a great contrast to the other kind. If one visits both, he would be surprised by the smallness, shabbiness and oldfashioned methods of the latter.

Exportation of eggs and their products is permitted only after the commodity has passed the test given by the Commodity Examination Bureau. The eggs and products, applying for test, should be declared under either of the two classifications—those for food or those for industrial use. Standards for the latter use are lower, so many exporters make a false declaration to secure an easy permit. Such practices, however, are harmful to the trade and must be corrected.

Several changes have taken place during the past years in regard to the export duties on this commodity. According to the last revision made on July 19, 1935, duty on fresh eggs and all processed eggs is uniformly 2.5% *ad valoreum* while that on preserved eggs is $1.00 per each thousand pieces.

f. Price Movements[8]

The General Price Movement. Table VI shows the wholesale prices for eggs in Tientsin and Wan-ping Hsien (宛平縣). These prices are quoted from the *Hopei Commodity Price Index Quarterly*, the publication of which began in May, 1929 and was suspended in June, 1934, so only figures for this period are available. The Wan-ping prices are used here for two reasons. In the first place, prices for Peiping are not recorded in the said magazine, the only source of any use, so Wan-ping prices are used in the place of Peiping prices. It may be noted that as these two districts are so close to each other in territory that they will

Table VI. Monthly Wholesale Prices and Wholesale Price Indices of Eggs in Tientsin and Wan-ping Hsien (May, 1929—June, 1934)
(Price in dollars per 100 eggs;
average for May, 1929—April, 1930 = 100)

Year	Month	Tientsin		Wan-ping	
		Price	Indices	Price	Indices
1929	May	1.90	80.5	1.80	91.8
	June	1.75	74.2	1.68	85.8
	July	1.90	80.5	1.30	66.8
	Aug.	1.90	80.5	1.28	65.3
	Sept.	1.83	77.6	1.43	72.9
	Oct.	2.24	94.9	1.66	84.6
	Nov.	2.35	99.6	2.00	103.0
	Dec.	3.80	161.0	2.20	112.2
1930	Jan.	3.80	161.0	2.20	112.2
	Feb.	2.75	116.5	3.20	163.2
	Mar.	1.95	82.6	2.75	140.3
	Apr.	2.20	93.2	2.05	104.5
	May	2.30	97.4	1.70	86.7
	June	2.00	84.7	1.70	86.7
	July	2.00	84.7	1.58	80.6
	Aug.	2.00	84.7	1.70	86.7
	Sept.	2.10	88.9	1.70	86.7
	Oct.	2.20	93.2	1.70	86.7
	Nov.	2.20	9.32	1.70	86.7
	Dec.	2.60	110.2	1.93	98.4

8 Price quotations in this section are those of the average prices for Fu Ti Ch'ai Chi Tzu unless otherwise mentioned.

Table VI. *(continued)*

Year	Month	Tientsin		Wan-ping	
		Price	Indices	Price	Indices
1931	Jan.	3.06	129.6	3.00	155.0
	Feb.	3.30	139.9	3.00	153.0
	Mar.	3.30	139.9	2.90	147.9
	Apr.	2.09	88.5	2.65	135.0
	May	2.05	86.8	2.00	103.0
	June	2.10	88.9	2.00	103.0
	July	1.80	76.2	1.85	94.3
	Aug.	1.81	76.6	2.00	103.0
	Sept.	1.90	80.5	2.00	103.0
	Oct.	1.90	80.5	2.00	103.0
	Nov.	1.92	81.3	3.00	153.0
	Dec.	2.18	92.3	4.00	204.0
1932	Jan.	2.37	100.4	3.50	178.5
	Feb.	2.30	97.4	3.00	153.0
	Mar.	2.13	91.1	2.50	122.4
	Apr.	2.00	84.7	2.00	103.3
	May	1.99	84.3	2.00	103.3
	June	1.93	81.8	2.00	103.3
	July	1.90	80.5	1.75	89.2
	Aug.	1.90	80.5	2.00	103.9
	Sept.	1.88	79.7	2.00	103.0
	Oct.	1.88	79.7	2.00	103.0
	Nov.	2.14	90.7	2.60	132.6
	Dec.	2.41	102.1	2.75	140.3
1933	Jan.	2.47	104.7	2.50	127.5
	Feb.	2.22	94.1	2.60	132.6
	Mar.	1.78	75.4	2.00	103.0
	Apr.	1.39	58.9	2.00	103.0
	May	1.53	64.8	1.30	66.3
	June	1.60	67.8	1.22	62.2
	July	1.65	69.9	1.20	61.2
	Aug.	1.68	71.2	1.20	61.2
	Sept.	1.68	71.2	1.25	63.7
	Oct.	1.62	68.6	1.30	66.3
	Nov.	1.80	76.2	1.60	81.1
	Dec.	1.80	76.2	2.00	103.0
1934	Jan.	1.80	76.2	2.00	103.0
	Feb.	1.80	76.2	1.90	97.9
	Mar.	1.50	63.5	2.00	103.0
	Apr.	1.20	50.8	1.60	81.1
	May	1.15	48.7	1.20	61.2
	June	1.16	49.1	1.10	51.1

probably show similarities in their price movements, though differences in actual prices are inevitable. Secondly, Wan-ping prices are here used to denote the price movement of a countryside market.

In order to obtain a general view of the trend of price movements, wholesale price indices are compiled with the average prices for the period from May, 1929 to April, 1930 as the bases. The results are represented more clearly on Fig. 6. It shows on the whole a downward movement. In Tientsin, the movements has risen slightly since 1929, but a sharp drop began by 1931 and no recovery has been made since. Wan-ping prices also show the same results, although the descent began about one year later. According to the average price we obtained for February, 1936 in Tientsin, i.e. $1.90 per 100 eggs, there is shown a slight elevation in comparison with that of the same month of 1934, i.e. $1.80 per 100 eggs. However, it is still far behind the figures for the same months of previous years, i.e. $2.22 for 1933, $2.30 for 1932, $3.30 for 1931 and $2.75 for 1930.

The Seasonal Fluctuation. The season indices of egg prices in Tientsin as enumerated in Table VII are computed by a link relative method with the figures enumerated in Table VI. The seasonal fluctu-

Table VII. The Seasonal Indices of Wholesale Prices of Eggs in Tientsin.

Months	Seasonal Indices
January	123.3
February	121.7
March	103.8
April	85.9
May	86.3
June	87.3
July	89.4
August	91.5
September	93.5
October	95.6
November	105.2
December	118.8

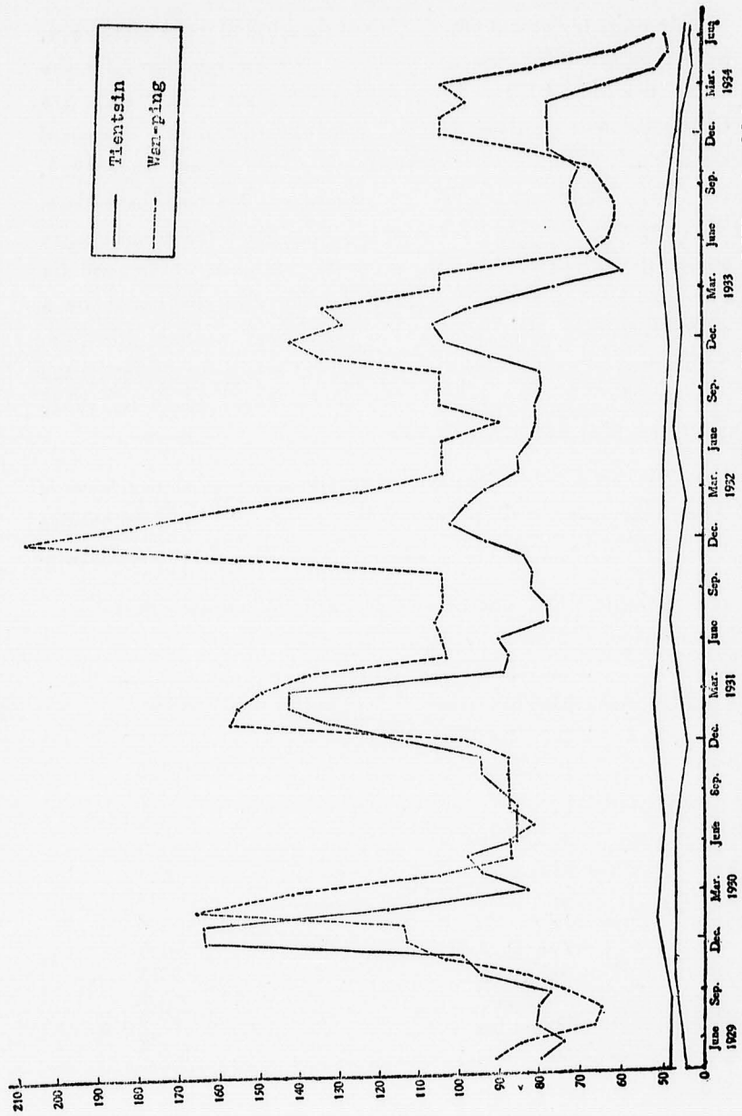


Fig. 6. Monthly Wholesale Price Index Numbers of Eggs in Tientsin and Wan-ping Hsien (May 1929—June, 1934) (Average for May, 1929 — April, 1930 = 100)

ation of this price is very remarkable. It reaches its peak in January and then starts to fall until July, when a backward tendency sets in again. The price remains comparatively steady from April to July, while from October to January the price fluctuates quite violently.

Such seasonal fluctuation may be attributed to the fluctuation of the quantity of supply. Fig. 7 gives the total quantity marketed through the seven egg inns in Peiping from February, 1935 to January, 1936 and the prices for the same period. The curves as presented in the chart move in an opposite direction and the correlation co-efficient ratio between them is -0.858±0.0524 which means a very high relationship of a negative nature. Such a high negative correlation is specially inevitable for Chinese egg trade, since cold storage for this commodity is not yet employed.

Price Relations Between Different Markets. Table VIII shows, for purpose of comparison, the ten-day average prices for 100 eggs, from February 1935 to January 1936, for three markets—the local, the intermediate, and the final. Prices for the final market are quoted from the records kept by the egg inns in Peiping, those for the intermediate market are secured from an account of a Peiping wholesaler who bought chiefly from Yen-chiao egg fair, while those for the local market are based on reports made by various egg collectors who directly deal with the poultrymen. The comparison is also shown graphically in Fig. 8. It will be seen from this and from Table VIII that the prices of these three markets move quite in conformity, i.e., during high prices the poultrymen are also highly paid, while during low prices their income is also lowered. This is true for all kinds of agricultural products. It is also true that poultry farmers are more poorly paid in periods of low prices than of high prices, as the margin between the local and the final prices tends to grow greater as price drops. However, this is not seen from this study.

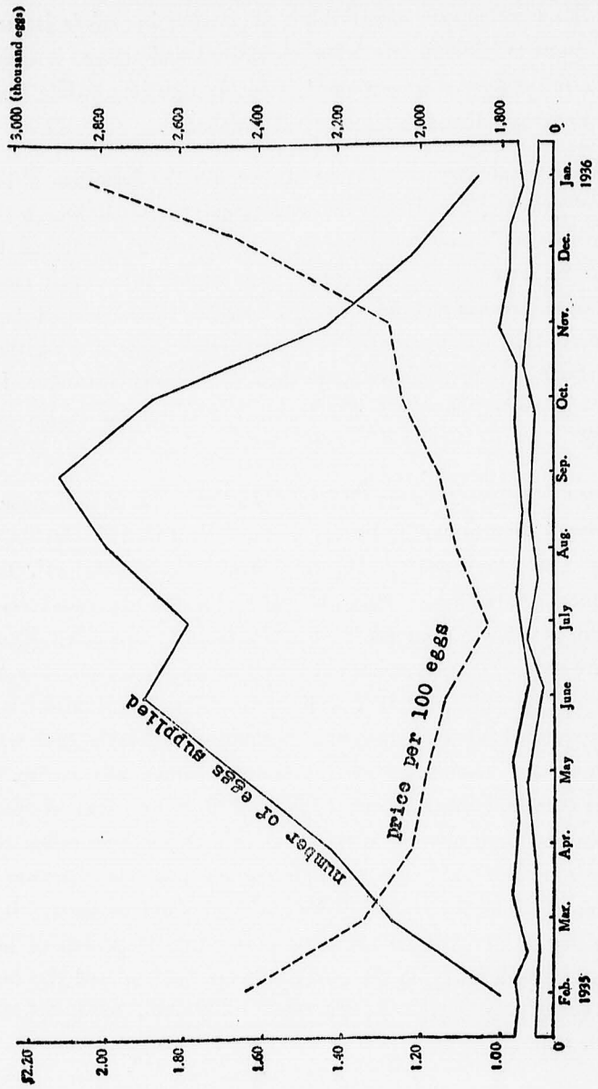


Fig. 7. The Movements of the Price and the Quantity of Eggs Marketed in Peiping, February 1935 — January 1936.

Table VIII. Price Movements of Eggs for Local, Intermediate, and Final Markets. (Feb., 1935 — Jan., 1936)
(In dollars per 100 eggs)

Year	Months	Days	Final	Intermediate	Local
1935	February	1-10	1.85	1.69	1.58
		11-20	1.59	1.54	1.50
		22-28	1.51	1.43	1.35
	March	1-10	1.43	1.35	1.29
		11-20	1.39	1.33	1.27
		21-31	1.33	1.27	1.19
	April	1-10	1.28	1.24	1.19
		11-20	1.24	1.19	1.15
		21-30	1.24	1.18	1.15
	May	1-10	1.24	1.18	1.13
		11-20	1.22	1.18	1.13
		21-31	1.22	1.17	1.13
	June	1-10	1.20	1.17	1.10
		11-20	1.18	1.12	1.04
		21-30	1.15	1.11	1.04
	July	1-10	1.09	1.06	0.94
		11-20	1.02	0.89	0.83
		21-31	1.06	1.00	0.90
	August	1-10	1.11	1.05	0.94
		11-20	1.17	1.10	0.94
		21-31	1.18	1.11	1.00
	September	1-10	1.18	1.10	1.00
		11-20	1.20	1.15	1.04
		21-30	1.20	1.17	1.04
	October	1-10	1.25	1.18	1.08
		11-20	1.30	1.18	1.08
		21-31	1.30	1.24	1.17
	November	1-10	1.43	1.31	1.23
		11-20	1.54	1.41	1.33
		21-30	1.56	1.47	1.30
	December	1-10	1.61	1.52	1.46
		11-20	1.67	1.54	1.46
		21-31	1.82	1.67	1.56
1936	January	1-10	2.00	1.85	1.65
		11-20	2.13	1.92	1.77
		21-31	2.13	1.92	1.89

Price Changes of Exported Eggs and Egg Products. Figures in Table IX are quoted from the *Chinese Custom Reports*. They illustrate how prices of exported eggs and its products have changed during the last 10 years, i.e., 1925-1934. The general trend of these prices as a whole, especially for recent years, shows a downward tendency. Examining them in greater detail, one can see that prices for dried albumen

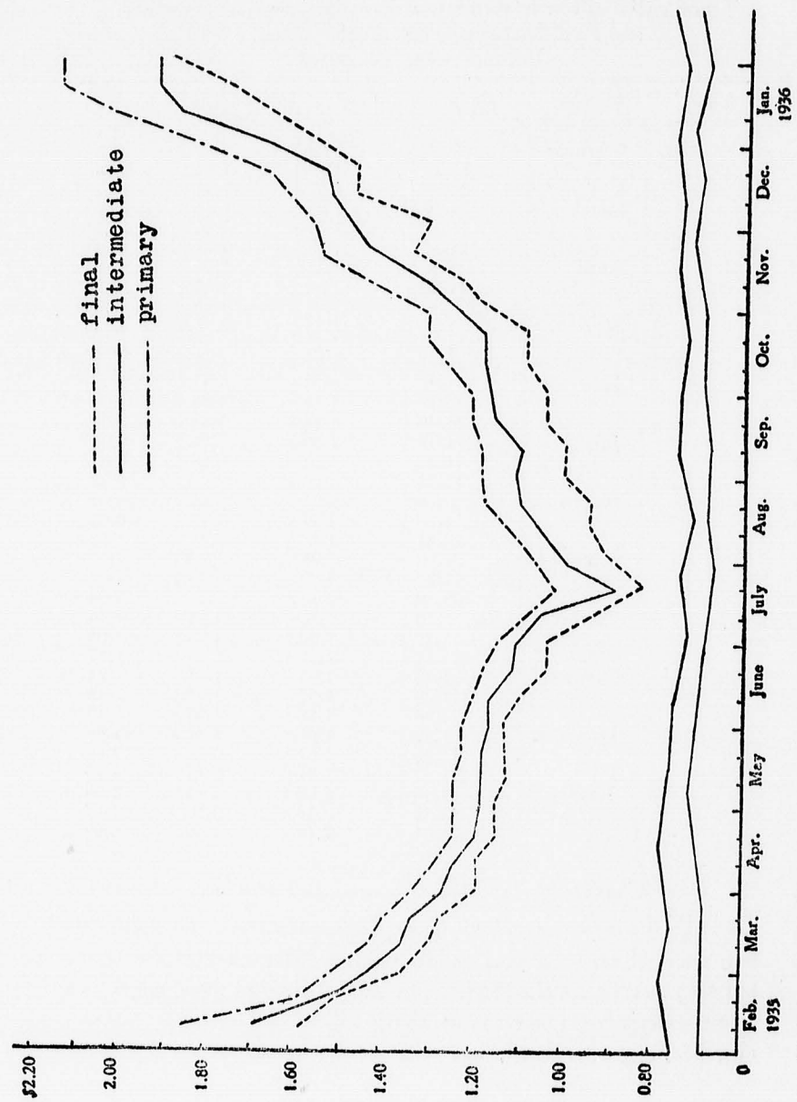


Fig. 8. Price Movement of Eggs for Local, Intermediate and Final Markets. (Feb., 1935—Jan., 1936)

were more promising than the other two. They advanced year by year with the exception of those for 1929, 1930 and 1931 which had approximately a 12-15% drop. Prices for froxen eggs progressed radically in the first four years, i.e., 1925-1928. The elevation, however, stopped henceforth, then remained at the old standard for the two following years; and began to go downward from then on. Prices of fresh eggs presented still another picture. Price for 1930 served here as a demarcation line, prices before this year had a positive progress while those after shew a regressive movement.

Table IX. Prices of Eggs and Its Products Exported from Tientsin, 1925-1934.

Year	Dried Albumen (H.K.Tls. per picul)	Frozen Eggs (H.K.Tls. per picul)	Fresh Eggs (H.K.Tls. per 1000 eggs)
1925	103.00	17.50	9.00
1926	111.00	33.50	9.25
1927	110.00	33.38	9.50
1928	110.00	45.00	9.50
1929	95.00	45.00	11.99
1930	96.00	45.00	13.50
1931	98.00	32.68	11.62
1932	139.39	22.07	11.00
1933	$233.60 (perquintal)	$34.52 (perquintal)	$14.66
1934	310.30	32.71	10.66

Analysis of the Prices Charged by Various Dealers. It would by of value to analyse the prices for the same egg charged by various dealers at different stages through its channel of marketing. With such an analysis we can discover what portion of the retail price, the amount that consumers pay, goes to the farmer, and what portion goes to the various dealers; and furthermore, of the latter, how much is spent as the cost of marketing and how much is received as the dealers' profit. On such an analytical study is based improvements of the marketing system of the commodity.

It is interesting to notice from Table X that the farther the distance of marketing, the less is the portion of the total price paid to the farmer, i.e., 78.67% of the Peiping retail price is paid to the T'unghsien farmer, 63.33% to the Huai-lai farmers while only 61.90% to the Kalgan farmer. Profit rates for various dealers as illustrated in the three cited cases are roughly quite uniform—they are about 50-60 cts. for country collectors 80 cts. to $1.00 for country dealers or wholesalers and jobbers, and 60-70 cts. for retailers.

CONCLUSION.

This sketchy but factual survey of the egg trade in Peiping area has at least given rise to two problems which may deserve further discussion. In the first place, is it profitable for poultry keepers to raise chickens as one of their subsidiary occupations; and secondly, if it proves profitable, is it worthwhile to introduce any improvement in the trade along the line of production and marketing and, if so, along what ways and by what means? These problems are vital not only to the trade of this limited area but also to that of the country to which the industry today contributes so great a part of the international trade.

If has been clearly shown in this report that so far the trade has not proved profitable to the male heads of those rural families which keep flocks in this area. However, it is also clear that this feature does not supply a ground for one to doubt that the trade is not a profitable one. The development of the trade as a sideline enterprise of Chinese farmers is undoubtedly much limited by the type of village organization, the small purchasing power of the majority of the populace, and the fact that Chinese peasants have very little surplus from their meager income to allow for the development of this enterprise. But if we look at the problem more carefully, we find that there is a growing use of eggs as daily food in our families apart from the potentialities of the trade of this product with foreign countries. That the egg is a

Table X. Estimates of Costs and Prices of 1,000 Eggs Traded at Different Markets.

Types of Markets	Nature	From T'unghsien to Peiping			From Huai-lai to Peiping			From Kalgan to Peiping		
		Cost or price	Surplus	% of retail price	Cost or price	Surplus	% of retail price	Cost or price	Surplus	% of retail price
Local	Farm price	$17.70		78.67	$9.50		63.33	$7.80		61.90
Inter-mediate	Price paid to the Egg Collector	18.50	$0.80	3.55	10.40	$0.90	6.00	8.60	$0.80	6.35
	1. Labor	0.30			0.30			0.30		
	2. Profit	0.50			0.60			0.50		
Final	Price paid to the Country Dealer or the Wholesaler	19.90	1.40	6.23	12.60	2.20	14.67	10.60	2.00	15.87
	1. Cost of Transportation	0.43			1.42			1.32		
	2. Profit	0.97			0.78			0.68		
Retail	Price paid to the Jobber	21.70	1.80	8.00	14.10	1.50	10.00	11.70	1.10	8.74
	1. Commission	0.79			0.32			——		
	2. Cost of Transportation	0.05			0.05			0.05		
	3. Cleansing & Grading	0.05			0.05			0.05		
	4. Breakage	0.10			0.10			0.10		
	5. Profit	0.81			0.98			0.90		
	Retail Price	22.50*	0.80	3.55	15.00*	0.90	6.00	12.60**	0.90	7.14**
	1. Overhead expenses	0.20			0.20			0.20		
	2. Profit	0.60			0.70			0.70		

* Price of the Fu-ti No. 2.

** Price of the K'ou-wai eggs.

nourishing food has long been understood by Chinese people. Gamble in his famous book pointed out that the use of eggs by Peiping families increases more than proportionally as the income increases.[9] If prices can be reduced lower than at present through improved marketing and production, the increasing use of eggs by these families is a reasonable expectation. It is beyond the writer's province, as an economist, to foretell of any improvement in the art of raising hens by farmers in this area, but, with the experience of those enthusiatic poultrists, such as Mr. Hunter of Jefferson Academy, that has been accumulated through many years of effort, it is not too much to expect that such valuable experience may extend to the ordinary man. The present indifferent attitude of the male heads of the families toward the trade is undoubtedly a great obstacle to improvement. But one must not neglect the fact that the sweeping away of this attitude depends largely upon the improvement which will finally bring about a margin of profit great enough to draw his attention and arouse his interest.

The possibility of the development of the trade, furthermore, lies on the fact that farmers in this area have a larger amount of spare-time than those in other parts of the country. These farmers are totally idle in winters. Therefore, poultry raising, being more productive, and so occupying more labor will serve in winter as a sideline enterprise supplementary to their main work.

Despite the manifold possibilities of the improvement and the development of the trade, we are not unaware of the rapid decline with which it has been confronted in recent years. Domestic prices have started to fall and never recovered since 1930. The setting up of tariff barriers by countries which have been importers of Chinese eggs and the rapid development of the same trade in these and other countries add more menace to our own trade. But, likewise, such unfavorable conditions can only be remedied by the improvement of the trade.

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[9] See Note 1.

Before we proceed to suggest measures of improvement, it is worthwhile to spare a little space for appraising the present practice as we have described it above, for such measures should be based upon these appraisals. Present defects include (1) the negligence of the male family heads, (2) dependence of hatcheries upon egg dealers for fertilized eggs collected from ordinary farmers, thus degenerating the quality of the breed, (3) the unscientific system of grading according to sources of supply, (4) the fixing of price on a per dollar basis which bars attempts of improvement, and (5) the mixing of stale and bad eggs with fresh ones which tends to ruin both the domestic and the international trade. For the removal of the above enumerated defects, a number of suggestons are set out below for consideration.

The first step would appear to be that producers should be supplied with improved breeds of fowls which will yield more and larger eggs and so bring greater profit to them. It has been pointed out that the experiments undertaken by the Chicken Improvement Farm of the Lu Ho Rural Service Center show that through scientific methods of care even the native breed can improve in its productivity[10]. A still better yield has been shown by the same Farm from the crossed breeds of the native fowls with foreign ones. So a replacement of the native fowls with these improved breeds will effectively meet our aim only if there are strict measures of centralized supply and close supervision. This report has also shown that native hatcheries in Jen Chia Chuang, T'ung-hsin, have in the past marketed their chicks to a very considerable extent in both Hopei and Suiyuan. Therefore, co-operation between these two, the native hatcheries and the Improvement Farm would easily help towards the end in view.

The question that next arises is how to insist on standards to facilitate the marketing of the eggs in this area. Standardization has long been essential to an effective marketing of agricultural goods of which the egg is one. Various bases for grading eggs were suggested

[10] See p. 379

by many countries. Canada affords an example of this. The Canadian regulations, the first of which was issued in 1922, were regarded as a considerable departure from regulations adopted by other countries. Besides the specifications as to interior quality the following weight grades are provided for fresh egg:

Grade A., Specials—Eggs of uniform size, weighing 25 oz. to the dozen and over . . .

Grade B., Extras—Eggs reasonably uniform in size, weighing at least 24 oz. to the dozen. . . .

Sub-Grade (1) Pullet Extras—Eggs which have the quality of extras, but which fall short in weight, shall be known as pullet extras, providing they weigh at least 20 oz. to the dozen. . . .

GradeC., Firsts—Eggs weighing at least 22½ oz. to the dozen.

Grade D., Seconds—No weight-grade.

These grades apply the regulation to eggs sold both wholesale and retail. The Ministry of Agriculture and Fisheries of Great Britain after a careful and penetrating study of both home and foreign conditions, suggested in 1927 the following national weight-grades for fresh and preserved home-produced eggs for England and Wales[11]:

Grades	Weight per 120 eggs		Minimun egg weight
	Nominal	Actual	
Specials	17 lbs.	16½ to 17 lbs.	2 1/8 oz.
Standards	15½ ,,	15 to 15½ ,,	1 7/8 ,,
Smalls	14 ,,	13½ to 14 ,,	1 5/8 ,,

Dozens of examples can be cited from various countries. The idea of fixing weight grades for marketing of eggs has also been adopted by

[11] Ministry of Agriculture and Fisheries, *Report on Egg Marketing in England and Wales*, p.51.

the exporters at Tientsin. Shell eggs that are exported as fresh ones should weigh 60 lbs. for 500 of them. Such standards, however, should not be too far from the actual conditions, and on the other hands, should be generous enough to bring about elevation of the standard. Accordingly, Mr. J. A. Hunter suggested that a better system for grading local eggs in this area would be to determine on a weight for ten eggs e.g., one *shih chin* (市斤) for ten eggs for first class. Any above that would be special class, two *liang* (兩) less per ten eggs would be second class, and so on down.

Another criterion for the grading of eggs is their interior quality without the cognisance of which grading cannot be very effective. Although the term "fresh" has never been satisfactorily defined, it is a term which has been so commonly used by the general consumers as the equivalent of "newly laid." Actually, however, an egg newly laid, though usually, is not always an egg of the highest quality, so, in addition to the time element, it is necessary to rely on other qualifications which, taken together, afford an unequivocal indication of quality. These qualifications are concerned with condition of shell, size of air space, clearness and density of white, visibility of yolk, and absence of abnormalities. For all ordinary purposes, the standard appearance of a fresh egg as defined by the Government of Northern Ireland in 1924, is a sufficient guide. This is as follows:

> Air-space not more than ¼ inch in depth. Yolk, faintly visible to visible. White, clear and firm[12].

The specifications adopted by the Canadian Government in 1924 are more stringent, as follows:

Class (1) Fresh Eggs[13]

[12] *Ibid.*, p. 31.

[13] Eggs classified as "fresh" are those which have not been held under refrigeration at a temperature of 35° Fahrenheit or less except when in transit, or subjected to artificial preservation. See *Ibid.*, pp. 31-32.

Grade A. Specials.
Air cell not more than 1/8 inch in depth; white of egg to be firm and clear and yolk dimly visible.

Grade B. Extras and Pullet Extras.
Air cell not more than ¼ inch in depth; white of egg to be firm; yolk may be visible provided there is no distinct trace of outline and the yolk blends gradually into the white.

Grade C. Firsts.
Air cell not more than 3/8 inch in depth; yolk may be distinctly visible but moving freely; air cell stationary; white of egg may be slightly tremulous, any undulation in the air cell line to be not more than 1/8 inch in depth.

Grade D. Seconds.
May comprise weak watery eggs, eggs with heavy yolks and all other eggs fit for food.

The test of these qualities can satisfactorily be made before a pencil of strong light. This process, though known usually as candling, can be carried out with electric, gas, or oil lamps, or even with sunlight as well as with a candle; when efficiently done, it shows the condition of the air-space, yolk, and white of the egg examined, and reveals at once any extraneous substances such as blood clots. It is, of course, only possible to attain a fair degree of accuracy by an experienced operator. However, since such a detailed examination is generally not required for commercial purposes, one which is able to distinguish the appearance of a fresh egg when candled and to recognize undesirable features will be adequate. For this reason, candling by distributors is a fairly frequent practice in many lands, and in countries where the importance of this process has not been realized laws are usually enacted for the enforcement of it.

Candling of eggs is not common in this area yet, especially for the retailing in the home market. So we should like specially to recommend to all egg merchants that such test be made if they want to safeguard their own interests. This is more desirable for the marketing of exported eggs because one bad egg, undetected, might discredit all our output and ruin the trade as a whole. According to the experience of foreign egg dealers, candling of every egg is desirable at certain seasons when the egg deteriorates easily, and only a sample test is necessary for the rest of the period. Stricter candling is indispensable in this area in the months from April to August, owing in the first place, to the warm weather which causes rapid deterioration and, secondly, as we have pointed out, there is the frequent inclusion of partially incubated eggs in consignments.

The third suggestion is that all collectors who carry on the business of purchasing eggs for resale other than by retail should sell by weight, instead of by number as at present. The system of selling by number, i.e., by so many eggs for a dollar, neither makes recognition of differences in quality, nor offers advantages for larger eggs, for under this system, all eggs are traded at uniform price regardless of the size. Producers under these circumstances would not prefer to produce large eggs because the large eggs could not command a more profitable price to compensate for the special efforts that have been taken. Therefore, it is very clear that this pricing system must be a severe hindrance to any improvement that would be proposed to producers. To sell by weight does not only encourage improvements in production but also facilitates the carrying out of a scientific grading system in the channel of marketing, as suggested above.

The proposals outlined above are not put forward merely as an indication of the courses of improvement along which the egg trade in this area could take, but it is expected that they should be put into

realization by effective action. So far as the experience of other nations goes, none has been more satisfactory and successful than that of co-operation in bringing to the poultry-keeper a betterment of his trade and in consequence an increased income. In Denmark, the home of agricultural co-operation, an overwhelming portion of her eggs is collected, packed, shipped and sold through a national co-operative organization, the Danish Co-operative Egg Export Society, or the D. A. E., as the society is called. Eggs marketed by this society are known for their freshness and evenness of quality and bring high prices. This society, having now a total of 700 branches with 45,000 members, came into existence only about forty years ago. Mr. F. C. Howe wrote laterly:

> "Prior to about 1880 the control of eggs and poultry was in the hands of middlemen who sent buyers about the country who purchased the eggs for shipment to the British market at an agreed upon price. The speculators withheld the eggs for the winter market in order to secure higher prices. The eggs were not always fresh when marketed and the Danish producer suffered in consequence. The farmers tried to control the situation among themselves by agreeing to deliver only fresh eggs. But they were balked in their efforts by the speculators. Finally the farmers realized that they must find some means of getting past the middlemen, just as they had in the case of butter and bacon. So they organized a society to collect, store and distribute eggs themselves....." [14]

The movement has since been established as a satisfactory check to the evils of speculation. The same writer complimented the movement with the following words:

> "The result of the co-operative movement has been to standardize the Danish egg and to raise the price to all of the farmers. In addition, the control of the market by the middlemen has been broken....." [15]

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14 Howe, F. C., *Demark—The Cooperative Way*, 1936, pp. 97-98.
15 *Ibid.*, p.99.

It has long been the claim for co-operation in the field of egg marketing that it facilitates improvement in grading and standardization of produce, packing and packages. Judged by the Danish experience, this is a reasonable claim. On the other hand, there are also instances where private merchants have taken the lead in introducing more efficient and up-to-date methods and have, themselves, done as much to raise the standard both of production and marketing technique as the co-operative organization could have done. Another advantage claimed for co-operation is that it safeguards producers against private monopoly and unfair practices. The importance of this certainly varies with the circumstances of each individual case. As to the business end of the problem, it has to depend largely on local conditions and the efficiency of the internal management of the co-operative society itself. If in any locality producers have to choose between an efficient individual trader, who is prepared for and understands how to meet reasonable and lively competition, and a producer, who is poor in vision, management and technique, they will do better with the former. Moreover, co-operation should only enter the field when price data show that there are real economies to be effected.

In China, co-operation, though not unfamiliar to the peasants, is at present still mainly a co-operative credit movement and has not affected the farmers in the field of egg production and marketing[16]. In spite of this, judging from the facts we have revealed in this report, such as lack of initiative in the improvement of the market methods by the traders, and the production technique by the farmers, and the large share of profit swallowed by the middlemen, there are sufficient reasons for us to believe that the application of co-operative principles to the egg trade in this area is extremely desirable, though its success relies largely upon

16 There was one egg marketing society in Chia-hsing (嘉興) in Chekiang which was unsuccessfully managed. It had ceased to operate by the time the writer visited it in the summer of 1936.

the efforts of the farmers as well as the outside circle from which technical advices can be obtained. Towards this, we may again offer a few tentative suggestions in the ensuing paragraphs.

As to the types of egg marketing co-operatives, the simplest one is when groups of producers combine to consign their eggs to a common market in bulk, or to arrange a local sale as one unit. It is from such simple beginings that many of the largest co-operative organizations abroad have sprung. The more developed organizations generally fall into the following two types: the central type and the federal. In a sense, the federal type rests on a firmer base than the central, a fact which may have important reactions on such questions as loyalty and management. In either case, produce may be disposed of by private treaty or by auction. The central type is incorporated for trading purposes in the ordinary way; the central organization of the federated group is also incorporated as a rule, but the units federated may or may not be separately incorporated according to circumstances. All the well organized societies in countries abroad may fall into either of these two types.

In this area, the situation is somewhat different. As we have pointed out the problems left for the co-operative to tackle are manifold; the society, therefore, cannot be organized merely for ordinary marketing purpose. It must be an organization that, in addition to the marketing functions, can readily look after the execution of the devices for the improvement of the trade as outlined above. T'unghsien may be a suitable place for the location of it, for there are located the native hatcheries which have in the past supplied chicks to an area covering nearly all the spots from which eggs in this area mostly come. Besides, it is also in the district where the Chicken Improvement Farm of the Lu Ho Rural Service Centre is located whose experience accumulated through many years may be of great help to the work. With this as the centre, a

number of collecting depôts may be organized with each serving a *hsien* area. In addition, sale agents should also be established in central markets, Peiping and Tientsin, in order to facilitate the marketing of the product.

These three organizations of the co-operative structure—the society with its headquarters the collecting depôts, and the sales agents—would each perform a special function. First of all, the society should immediately undertake the function of improving the quality of the egg. Foreign experience shows that this goal could be achieved by the adoption of the policy of stamping eggs. The stamp bears a distinctive letter and number, so that every egg can be traced back to the member concerned. Eggs found to be below standard are returned to the actual sender who is not only required to replace them but also charged a fine and even subject to expulsion if he has made a number of offences more than is allowed. In addition to this, the co-operative for this area should undertake the task of supplying its members with improved-bred hens and cockerals.[17] The supply to farmers with improved seeds of several staple crops, such as cotton and wheat, has been quite effectively taken up by many private and official agricultural institutes in recent years in this country. It would not be too difficult for the society to carry out this aim if enough assistance could be given by the co-operating technicians. Another function for the central society to perform is an educational one. Egg producers in this area have much to learn about the methods of production. There is also much to teach them on marketing problems. Only after they know the trade, can they take active interest in it.

The depôt system is widely adopted by western countries for the collection of eggs from members. Depôts are established with primary

17 Cf. Hunter, J. A., *Which Is the Suitable Chicken Breed for Extension?* (那個是適合農村最好的雞種) *Information Bulletin*, No. 14, June, 1937. This is published quarterly by the Lu Ho Rural Service Center, T'ung-hsien, Hopei.

regard to transportation facilities, and to the importance of the area from a producing standpoint, and each depôt area is managed by a collector. Collectors are notified from head offices at frequent intervals of the prices they are to pay for eggs as from the date of receipt of the advice. They are usually authorized to make necessary deductions from the notified price in respect of eggs below the standard. Cars are sent out to members at definite intervals for the collection of eggs. Eggs when collected are sorted, tested, graded and packed at the respective depôts and will be despatched either to the head offices or directly to such customers as may be notified from the headquarters. Besides these functions, the depôts also as a rule take care of the storage and finance, the producers paying them in advance according to prices fixed by headquarters before the eggs are actually marketed. In this area, the collecting depôts should undertake an additional function, i.e., to serve as extension stations for the central society for the supply of improved breeds to members. Moreover, in view of the unregulated and violent fluctuation of prices, it is perhaps more satisfactory that the eggs should not be bought at the full prices. This practice, not uncommon in the field of co-operative marketing of other products in this country, generally safeguards the interests of the society as well as that of the individual members. The margin thus left can afterwards be returned to the producers as bonus according to the amount of their delivery, one of the essential principles of co-operation.

Finally, the sale agents will be found useful in supplying the society with accurate market information and in distributing the stocks received from the depôts in central markets. As most eggs received in central markets are at present marketed through the Chi Tzu Tien in Peiping, or the Chi Tzu Hang in Tientsin, it might save much trouble and reduce the expense if some of them could be asked to serve as the sale agents at the initial stage.

The above sketch is only a tentative plan, which may have tobe

modified either in the scope of geographical area or with regard to the respective functions, after further consideration of the practical situation. However, it is important to point out here that the execution of this plan should interest many parties directly or indirectly concerned. The immediate groups interested are the co-operative institutes, such as the China International Famine Relief Commission, the technical organizations, such as the Lu Ho Rural Service Center, and the banks which have in recent years been ready to finance the co-operative movement in China.

鄭林莊 Cheng Lin-Chuang.

Yenching University.

DAVID SMILES THROUGH

by

Sam Dean

(Sam M. Dean, Professor of Engineering at Yenching University, Peiping, is now in the United States on furlough.)

David Chang is so tall and thin he looks like a pair of animated chopsticks surmounted by a fine face and a big, kindly smile.

Chopsticks are mighty useful in China. Most Chinese wouldn't eat much without them. When Japan closed Yenching University in Peiping, one of the Christian Colleges in China in which Methodists cooperate, she also shut off all incoming mission funds. Faithful, earnest, elderly father Chang lost his small income. David was no longer a carefree sophomore majoring in sociology at Yenching. Now he must start putting into practice what he had learned in college, for he was the main bread-winner of his family.

David transferred from sociology to journalism, where he started on the bottom rung as a proofreader, but hard work and a big smile did their part. And smile by smile he slowly climbed the ladder of achievement.

At this time the Drum Tower Presbyterian Church in Peiping was finding it difficult to hold its congregation together. Who but David could be relied upon to help young pastor Shao keep alive an interest in the church on the part of its younger members?

Finally the terrible war was over and David could return to his beloved Yenching. Soon his long legs were carrying that big smile all over the campus.

"Well, David," I said one day, "have you given up Journalism?"

"Oh, no," replied David. "My fellow Christians and I of the Drum Tower Church and Yenching feel there is need for a Christian magazine

for Chinese young people. Here are some copies of the first four weekly editions we have just published."

I looked through the little magazines in amazement. They contained not only translations, but also original articles and poetry. There were articles on science, engineering, agriculture, world affairs, love, sociology, psychology, business and other topics, interspersed with Christian articles and short sermons.

"David, it takes a lot of work to get out one of these each week," I said.

"Yes, but many of my friends in the church and at Yenching help me," he replied with a smile. "I plan to give my life to preaching Christianity through Chinese magazines, so I feel I had better start the work and learn now."

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File in Yenching folder

ENGINEERING COURSES AT YENCHING UNIVERSITY,

PEIPING, CHINA

Sam Dean

Missions have long understood the need for Engineering and Industrial Educational Programs in their school. More has been done along this line, in many parts of the world, than most Americans are aware of. However, the comparative cost of equipment to carry on such work has limited its expansion in Mission Institutions. The work done by the missions in the Peiping, China area might well show something of what has similarly been done elsewhere as well.

Over twenty years ago the Presbyterian, Methodist, American Board and London Mission combines their institutions of college rank under the presidency and leadership of Dr. Stuart (now American Ambassador to China) to form Yenching University. They were unable to carry an Engineering College but in their Science College built up a strong course in Industrial Chemistry which greatly affected the ceramic and leather tanning industries of all China. Not only did their graduates enter and better the native industries, but outstanding research work was done in the China Industries and specially equipped Tanning and Ceramic Industries of the University.

The Presbyterian Mission felt the need for training the sons of its Christian Church members in trades. Simultaneously they wanted to more adequately handle their Building and equipment problems in over thirty China Stations. Three Americans and a number of Chinese became the combined Engineering and Architectural staff of the Presbyterian Building Bureau for China and the North China Institute of Engineering Practice. Graduates of various Senior High Schools were selected, and sent to Peiping, by missionaries in different China Mission Stations. These men were either trained in Mechanical Engineering or in Architectural Engineering. The former worked six months of each year in the

Institutes shops as apprentices, turning out radiators, boilers, hospital equipment for China Mission Institutions. The latter worked as apprentices on the erection of China Mission Buildings for six months of each year. For the remaining six months of the year both staff and students were engaged in class and design work.

The entrance of Japan into active warfare against China intensified the drive and urge, on the part of Chinese Christians, for adequate Engineering courses in Yenching University. To satisfy this demand Industrial Chemistry was further strengthened toward the day when it might become "Chemical Engineering." Indeed the course then given would be so rated by many institutions. A further course was added to the University Curriculum called "Pre-Engineering" but in reality "General Engineering" with courses which would enable graduates to fit directly into North China industries.

The entrance of America into the war with Japan and the seizure of all Allied Sponsored Institutions of course put an end to these various pieces of work. British, American and Chinese staff were imprisoned and the buildings denuded of their equipment. Simultaneously Chinese industries, of any size, were taken over directly or indirectly by the Japanese.

The end of the war brought return to Chinese of their industries. They had great plans and needed Chinese engineers of experience to help carry them out. The Chinese industrialists went to Dr. Stuart and the Chinese professors of Yenching University and urged that they start a new type institution in which students went to class in Engineering courses for six months of each year and worked in the Chinese industries for the reamining six. They provided committees of their leading Chinese Engineers to work out the curriculum and agreed to substantially assis in financing the school.

In the meanwhile most of the various Mission Boards who had been

running thirteen strategically located colleges and universities in China (Yenching was the most northern) had decided to amalgamate their efforts under one Union Board of directors. Dr. McMullen resigned as president of Center College to head up the organization. Their plans called for one Engineering College to be based on and headed up in Shanghai. Not only Yenching University but also Hangchow Christian College, Nanking University, St. John's University and Lingnan University had previous to the war had engineering colleges; for China was more interested in Engineering Education than in most other types of courses.

The war damage to the thirteen China Mission Universities was enormous. At least $15,000,000 would be required to restore them. As much as it was de desireable to meet the Chinese anxiety for technical education, it was first necessary to restore what had been ruined. However, by judicious planning, much could still be done, within the limits of available resources. Hangchow Christian College had an Engineering College which could be combined with the Engineering work at St. John's and Soochow to give good courses in Civil, Electrical, Mechanical and Architectural Engineering in the Shanghai Area. Chemical and General Engineering at Yenching University together with Agricultural Engineering at Nanking University were all imeediately possible by such correlation as would allow transfer of students between China Mission Institutions for specialization would give a well rounded Mission College Engineering Program for China. Though the details still remain to be worked out and replacement equipment has not yet been sent to China; it is interesting to note that in all Mission Institutions mentioned there are already under way, beginning classes in Engineering.

It may be of interest to note in passing that the Chinese saw successive

countries defeated by successively more powerful industrial countries. They now believe industry is the solution to all national ills. We can readily imagine the impact upon China and the world of a huge new industry built up on Pagan ideals without Christian principles. Yet China is sending hundreds of non-Christian Chinese to America to learn about industry. Unless Missions can keep abreast of the times and furnish Chinese industry with a Christian leadership which will make of it a power to serve mankind and God, the Devil will furnish his own leaders to weld Chinese industry into a terrible force for evil. Good or bad, industry is on the way into China. It is up to the Christians of the world to see that it is Good and not Bad.