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SOME OBSERVATIONS

On EDUCATION

Dr. C. H. Geoffrey Oldham

TRADE

J. Russell Love

POLITICAL PROCESS

Anna Louise Strong

In CHINA

INTRODUCTION

FAR EAST REPORTER is happy to share with its readers these three articles dealing with subjects on which the publisher is often asked questions - education, trade and political process in China.

The authors- a Britisher, a Canadian and an American - are each specialists in their respective fields.

Dr C H Geoffrey Oldham is a British-born geophysicist, trained in Canada, and a specialist on Chinese science. Mr J Russell Love is a Canadian, a former member of the Alberta Legislature and a former Provincial Treasurer, a life-long dairy farmer, for thirty years the managing editor of the Coop-News, now retired and keenly interested in world affairs; on two occasions he has visited the Soviet Union and China. Anna Louise Strong, writer, journalist, and foreign correspondent (now residing in China) needs no introduction to either American or world audiences; her monthly "LETTER FROM CHINA" keeps its readers up-to-date on developments in that fascinating and pivotal area of today's world.

Dr Oldham's article appeared in the weekly publication of the American Association For The Advancement of Science, "SCIENCE", of February 12th 1965, Vol 147, pages 706-714; permission to reprint was given both by the editor and the author. Mr Love's article appeared as a brochure and is reprinted with the permission of the author. Anna Louise Strong has given permission to reprint excerpts from her "LETTER FROM CHINA" of January 25th 1965.

Science in Mainland China: A Tourist's Impressions

Visits to universities and research institutes show significant efforts to bring science to the people.

C. H. G. Oldham

In 1958 J. T. Wilson, professor of geophysics at the University of Toronto, spent a month in China as a guest of the Academia Sinica in Peking. He went in his capacity as president of the International Union of Geodesy and Geophysics to see scientific work in geology and geophysics, and he has reported on his observations (*1*). I had studied under Professor Wilson, and one by-product of his visit was an intensification of my interest in scientific developments in Asia and in studying the Chinese language. Despite several requests to Chinese scientists and the Academia Sinica, it has never been possible for me to visit China in my capacity as a geophysicist. So, when, in the spring of 1964, a Canadian travel agency was invited by the Chinese Government to send a group tour, I applied to join, to visit China as a tourist. Ultimately all other members of the tour withdrew, and I was able to visit China on my own.

Initially the tour was for 2 weeks in mid-October 1964, but once in China I had no difficulty in extending my stay to a month. I spent a week in Peking, 5 days in Nanking, 3 days in Soochow, a week in Shanghai, 3 days in Hangchow, and 3 days in Canton. I flew from Canton to Peking but made the return journey by train.

In Peking I saw all the classic tourist attractions, but my requests to visit the Academia Sinica, the university, and the Museum of Peking Man were refused. Nanking was quite different. There my requests to see the university, research institutes, a commune, and a scientific instrument factory were approved, and only my request to see the Purple Mountain Observatory was rejected—on the grounds that the road was under repair and impassable. In the other cities I visited I was able to visit schools, universities, and communes, although nowhere else was I able to visit a research institute.

From the point of view of my scientific specialty of geophysics the trip was disappointing. In fact I saw no scientific research work on which I am qualified to pass a professional judgment. But from the point of view of the study of scientific development in Asia the visit was quite rewarding. My visit was in many ways superficial, and although previous study, in Hong Kong, of Chinese scientific developments added some depth to my observations, it would be quite wrong to conclude that the conditions I saw are typical of China as a whole. But first-hand reports of Chinese science are fragmentary at best, and my impressions may add a few more pieces to the jigsaw puzzle of Western knowledge of Chinese science.

My visits to institutions followed a set pattern. I would arrive at the appointed time accompanied by an interpreter supplied by Luxing She (China International Travel Service). Invariably there would be a "reception committee" waiting on the steps of the institution—usually consisting of a professional man, an administrator, and a secretary. We would go into a committee room and, after an official welcome, I would be given a "brief introduction." This introduction was frequently political and gave a Before and After Liberation comparison (*2*). I found that interruptions were not welcomed during this speech, but that afterward I was free to ask questions.

Although my Chinese was adequate for ordinary conversation it was likely to let me down in formal interviews where it was important to get precise meanings. So, after assessing the competence of the interpreter, I usually relied on him and concentrated on the substance of the interview. The professional people answered professional questions, but the administrative personnel answered all questions with a political bias. My questions were always direct, and the answers were usually equally frank. During the question time the secretary from the institution made notes both of my questions and of the answers given. I once asked why notes were made and was told that sometimes useful ideas arose from question-and-answer sessions such as this. I also took notes on most occasions. After the question period we toured the institute and then returned to the committee room for further discussions. Finally I would be asked to state my opinions and give criticisms of what I had seen.

I visited three comprehensive universities, one agricultural university, three research institutes, seven communes, two instrument factories, and six middle schools (high schools).

Universities

The universities which I visited were Nanking University; Fu Tan University, Shanghai; Sun Yat Sen University, Canton; and Hangchow Agricultural University. The information which I was given at the introductory talks and in answer to questions is compiled in Table 1 and in the following paragraphs.

Communist Party policy for higher education. Wang Der-jy, director of Teaching Affairs at Nanking University, outlined aspects of the higher education policy of the Communist Party. He said (*3*): "This is a socialist university run on the basis of the educational policy of the Communist Party. The University aims to train allround developed students, with a high social consciousness, and a high degree of culture and knowledge. In brief, we train the students morally, intellectually, and physically.

"We carry on the policy of education in ideology and politics. All students must learn the works of Chairman Mao, Marx and Lenin. In addition the students must be concerned with important issues both national and international. They must take part in productive labor so that they are enabled to have the viewpoint of labor. Every student takes part in this labor for one month a year. It can be in a factory or in the countryside. It is considered an important part of his education.

"Teaching is done according to plan and the characteristic feature of teaching is as follows: First, theory must be combined with practice. This means the students must make experiments in the laboratory and also field experiments and demonstrations in their specialties. Secondly, we follow the policy of giving as much basic theory as the student can master—that is, we stress quality rather than quantity. Thirdly, we teach the students to be self-reliant and show them how to educate themselves. There are only three or four

periods a day, so that the students have time to study on their own.

"Students are also trained for research work. In the lower classes they are divided into groups for simple research. For example, in biology they make collections of plants and specimens. They also participate in seminars. In the higher classes they begin to do independent research. Every student must write a thesis before graduation. The principal purpose is to train students to be in a position to master the latest science.

"Physical training is given in the lower classes, but there is no formal instruction in the higher classes, although everyone still does some physical exercises each day. Also, many students take part in recreational sport."

Entrance requirements. To be admitted to a university, students must first of all be graduates from a middle school. They must then sit for a State examination. Students are admitted to a particular university on the basis of the needs of the State, results of the examination, the inclination of the students, their health, and politics. "We look for all-round development," said Wang Der-jy. I found it hard to assess the part played by politics in the selection of students, but the percentage of children from peasant families at Sun Yat Sen University in Canton increased from 17 percent in 1953 to 64 percent in 1963, and in Nanking I was told that most students are from peasant families. Other things being equal, a student from a peasant family stands the best chance of selection. The ratio of the number of students admitted to the number who applied for admission varied from about 1 in 4 at Nanking University to the 1 in 20 from Anhwei Province who applied to go to Fu Tan University in Shanghai.

Course work. Once admitted, the students study for 5 years. The curriculum for the first 3 years is usually general, students from one department having some lectures in other subjects. For example, for the first 3 years students in physics also take mathematics and chemistry. For the final 2 years the students specialize on one branch of their principal subject, and in their final year they must write a thesis based on the work done in their specialty.

Examinations are given annually, but if a student fails he can usually sit for the examination again. Once admitted, very few students are obliged to leave the university before completing their course. These examinations are internal university examinations, but the curriculum is set by the State. Occasionally in some subjects the university sets its own curriculum, but this must also be approved by the State. One foreign language is compulsory for all students, and a second one is optional. English and Russian are the most common, although French and German are also offered at most universities. It seemed that English was the most popular.

Job assignment. After graduating, some of the best students are selected to remain for 3 more years to do postgraduate work, but the rest are assigned to jobs according to the needs of the State. The students can express a preference, but when I asked if the students could change jobs once assigned, Mr. Wang at Nanking replied, "Most students offer themselves unconditionally to the State. I have never heard of any wanting to change jobs; I'm not sure whether it would be possible for them to do so if they did want to." However, in Canton I got a different story. Here I asked what contradictions the university had faced. (This was always a useful question, since Mao Tse-tung has written that there will always be contradictions and most people felt obliged to tell their problems when the question was couched in his terms.) I was told that one of their biggest contradictions was the fact that some students wanted to choose their own jobs; they did not want to be assigned jobs by the State.

Research. In the comprehensive universities most staff members are expected to do some research, and each department had a handful of research students, but, as compared with most North American and British universities, the amount of research was very small. For example, the physics department at Nanking University had 1100 students but only 20 were postgraduate students.

Most of the research effort over the past 5 years in all the university departments I visited had been concentrated in designing and building teaching apparatus for 4th- and 5th-year laboratories. Only once, in the geology department at Nanking University (Fig. 1), was there any reluctance to discuss research work. When I pressed for details I was told that it was research having to do with socialist reconstruction. I asked whether this meant a study of economic minerals, and was told, "and rocks!"

Politics and the student. The amount of time which the student must spend in politics varies from university to university but averages 10 percent of total study time for a natural scientist and 20 percent of total study time for a social scientist. Once when I suggested that this was rather excessive, I was told, "We consider political education of our youth to be most important. The Western countries realize that they can do nothing with our present leaders, but they say that within two or three generations capitalism will return to China. We are determined to make sure it will not."

All students and junior staff members must devote a month to productive labor. This is usually at harvest time, although some students in Canton were spending half a day a week at such work during the 36-week university year, and another 2 weeks at harvest time. Those I saw doing this work all seemed to be enjoying themselves, and I noticed one girl at Hangchow University lightheartedly sprinkle a couple of boys with her watering can as she passed them. However, it was freely admitted that some students were reluctant to do manual work. The Oriental tradition of the scholar who refuses to dirty his hands dies hard even in Communist China.

Student life. Students pay no tuition fees and many (75 percent at Sun Yat Sen) receive maintenance grants from the State. Most textbooks are provided free, and medical care is also free. All the students at Nanking University lived in halls of residence. A wide range of clubs exist for extracurricular activities. These are organized by the students themselves, through their students' union.

About one-quarter of the students are women. When I asked about dating and student marriages I was told there was very little; "the students are educated not to talk about love"—and there appeared to be little action either. Western-style dances are never held at Nanking; I did not inquire about this at the other universities.

I saw most evidence of extracurricular activities at Sun Yat Sen University. After the formal visit I suggested to my interpreter that we stroll through the very delightful campus. It was late afternoon and we passed a group practicing folk dancing, another group doing militia training (with fixed bayonets), and a large group of students practicing for a political display they were to perform the following week at

the University's 40th anniversary celebration (Fig. 2). The biggest surprise, however, was to see several men practicing dirt-track racing with motorcycles.

Staff conditions. There are four grades of teaching staff: professor, assistant professor, lecturer, and assistant lecturer. University staff members receive a comparatively good salary for China—a full professor, for example, earns more than 300 yuan a month ($125 in U.S. money). This is six times the average salary of a factory worker or a commune director and almost three times the top salary paid in the Shanghai textile factory I visited. In addition, university staff members are provided with a house at a rental of only 3 percent of their salary, and all receive free medical care (dependents must pay 50 percent of medical costs). The professors are also eligible for free vacations at holiday resorts.

Some of the senior staff carry out their research at nearby research institutes of the Chinese Academy of Sciences. Fu Tan University has its own "spare time college," where staff members can take extra courses in their spare time to increase their knowledge. At Sun Yat Sen University the senior staff spend more time on research, the junior staff doing more lecturing.

I found all the academic staff members I met extremely affable, and all seemed delighted to show off their laboratories. I visited Nanking University on the afternoon following the announcement of the explosion of the Chinese atomic bomb; all the scientists there seemed in a particularly good humor and were obviously excited by the news.

Campus conditions. Sun Yat Sen University, in Canton, has a delightful campus. Spacious grounds, hills, ponds, trees, gardens, and lawns separate the teaching buildings and provide a pleasant academic atmosphere. Nanking University is also well laid out. New buildings have been constructed in the same architectural style as the old, with curved Chinese roofs. The buildings of Fu Tan University in Shanghai are strictly functional (Fig. 3).

Academic standards. This is one of the most important aspects of any university and, at the same time, the most difficult to judge on a superficial visit. I found two clues to standards: the experimental work which I saw in the laboratories and the academic standards reached by students from China who later studied at the University of Hong Kong.

The 1st- and 2nd-year physics laboratories of all the universities I visited were equipped for basic physical experiments similar to those performed in 1st- and 2nd-year laboratories at Toronto University when I was a demonstrator there 12 years ago. The 4th- and 5th-year laboratories were equipped for quite advanced experiments. The emphasis in physics was mainly on applied physics. Since none of the laboratories were for work in my own specialty, I will reproduce my notes, so that scientists can make their own judgment.

Nanking University

Geology Department. Saw petrology, optical mineralogy, paleontology, sedimentary petrology, and economic minerals laboratories. Sedimentary petrology had specimens with English-language labels, obvious relics of pre-1949 days. I noted one specimen labeled "Ordovician Sandstone, North Dakota." Department has 100 petrological microscopes, many made in China. Saw spectroscope for chemical composition of minerals, and German x-ray apparatus for crystal structure determination.

Chemistry Department. I was shown the 4th-year laboratory for experiments in electrolysis and spectroscopy. Students learn how to repair instruments. Chemistry students seemed proficient at electronics. Fifth-year laboratory [Fig. 4] contained a polarograph, sensitivity 10^{-10} gm. (chemists at the University of Hong Kong tell me this is high, but likely to be genuine since Nanking University has a noted Chinese expert on polarography on the staff). Also saw quartz prism spectrometer made in Nanking for use of students. In the next room there was a glass prism spectrometer for staff use and research. Was told both instruments could determine all elements in the periodic table.

Physics Department. Saw only 1st-, 2nd-, and 3rd-year laboratories as time was running short. Therefore given option of seeing Astronomy Department or the senior-year physics laboratories. Chose the former.

Astronomy Department. Has 28 cm diameter refracting telescope built before 1949, but all spare parts made at the University. It is mainly used for studying the brightness and spectrum of fixed stars. Also saw smaller 16 cm diameter telescope used for sunspot studies. Department has close scientific ties with the nearby Purple Mountain Observatory.

Fu Tan University, Shanghai

Physics Department. This was the best equipped department that I saw in any university in China. It has 200 oscilloscopes. I was shown the microwave laboratory for 4th-year students. All apparatus had been designed and built in the University. It had taken 1½ years and was completed in 1961. The 5th-year semiconductor laboratory had 21 experiments which are performed individually by each of the 70 students specializing in solid state physics. The experiments included: parameters of transistor amplifiers; effect of temperature on transistors; the electrical capacity of transistors; the maximum oscillatory frequency of transistors; and transistor noise characteristics. In another room there were experiments to measure the lifetimes of semiconductors [Fig. 5]. Four methods were used: photomagnetic effect; lens diffusion; double pulse; and photoconductivity decay. Also saw another laboratory where dislocation studies of germanium were carried out with a Zeiss metallurgical microscope. The final laboratory I was shown was equipped for plasma spectroscopy. It contained a grating photometer and was a part of the 5th-year course, to study the fundamental properties of plasma. This equipment had taken a year to build and was completed in 1960.

Chemistry Department. I saw only the kinetics laboratory. Most of the equipment had been designed and built at Fu Tan.

Biology Department. I was shown the biology museum, which was well stocked with specimens, nearly all of which were indigenous to China.

English Language Section of the Foreign Language Department. This section was well equipped with phonetics laboratory, soundproof rooms, classrooms with earphones arranged in eight rows so that each row could have different instruction. The walls of the classrooms were covered with English language slogans, including an enigmatic "Foreign languages are a weapon in the struggle for life." I was also shown the library and students' reading room. The only English language magazines available to the students that were not published in China were the American *Science and Society* and Marxist-Leninist journals from Australia and New Zealand. The teachers' library, however, had a good supply of philology journals from Western countries.

Hangchow Agricultural University

The science laboratories of this University were not advanced. The best equipped department that I saw was the soil science department.

Sun Yat Sen University, Canton

Physics Department. The elementary laboratories were well equipped, with stu-

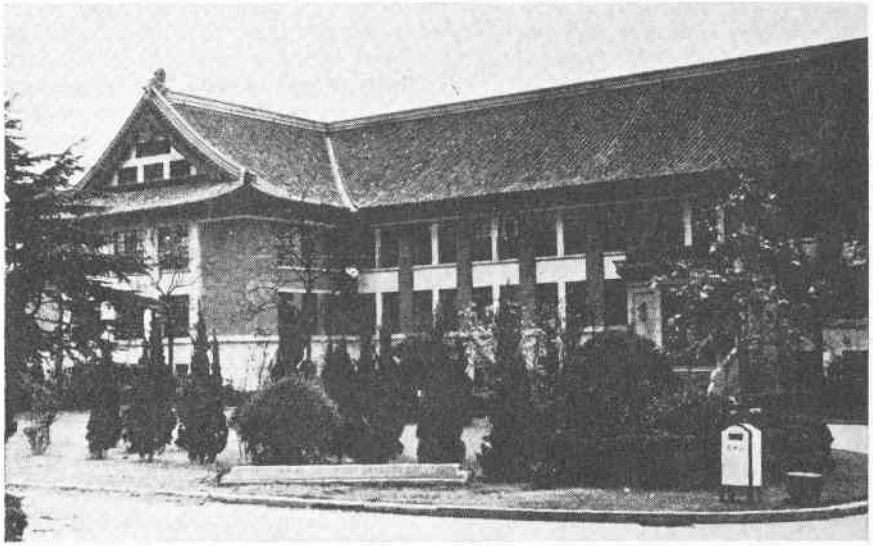


Fig. 1. Geology department building, Nanking University.

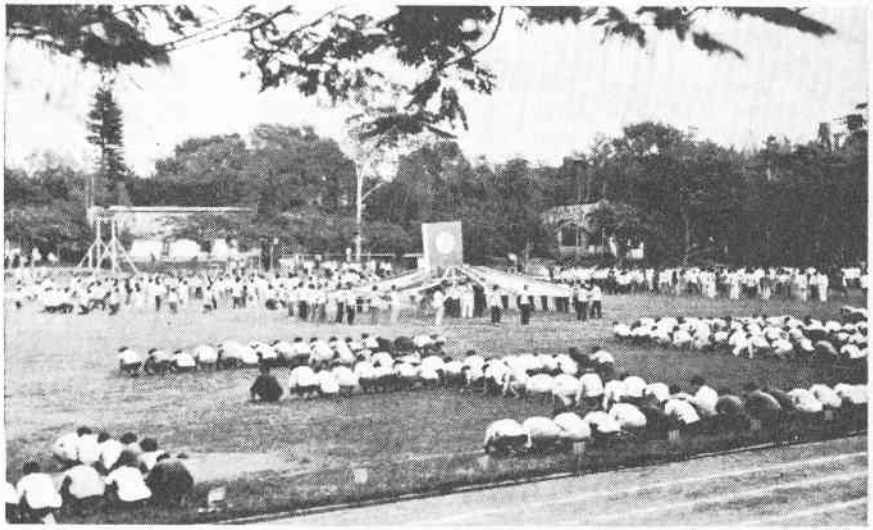


Fig. 2. Students at Sun Yat Sen University, Canton, practicing for a political display marking the 40th anniversary of the founding of the university. The students crouching in the foreground are forming characters, part of a slogan which reads "Long live Chairman Mao." Those in the center are parading, Maypole style, around a huge model of one of the volumes of *The Selected Works of Mao Tse-tung*.

Fig. 3. Chemistry department building, Fu Tan University, Shanghai.

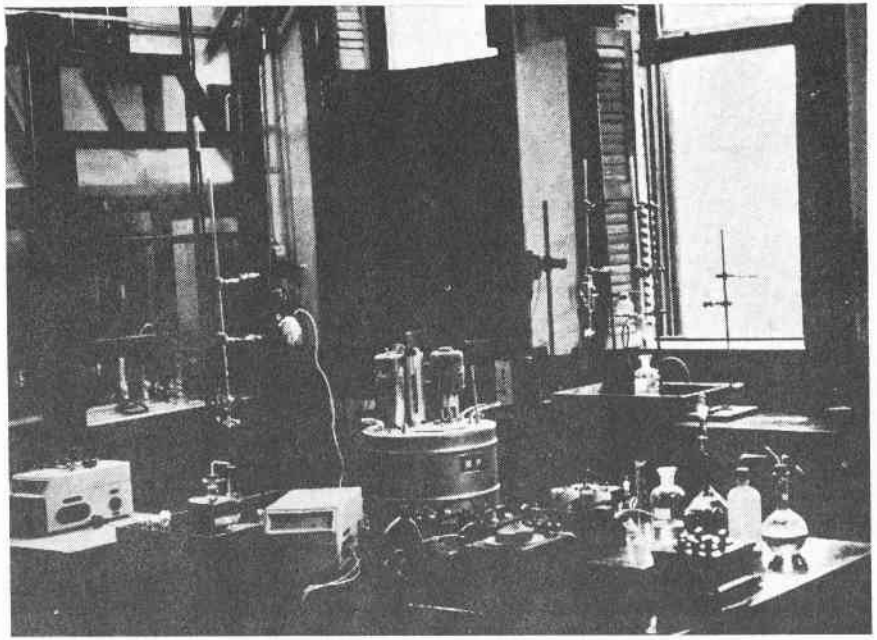


Fig. 4. A corner of the 5th-year chemistry laboratory, Nanking University.

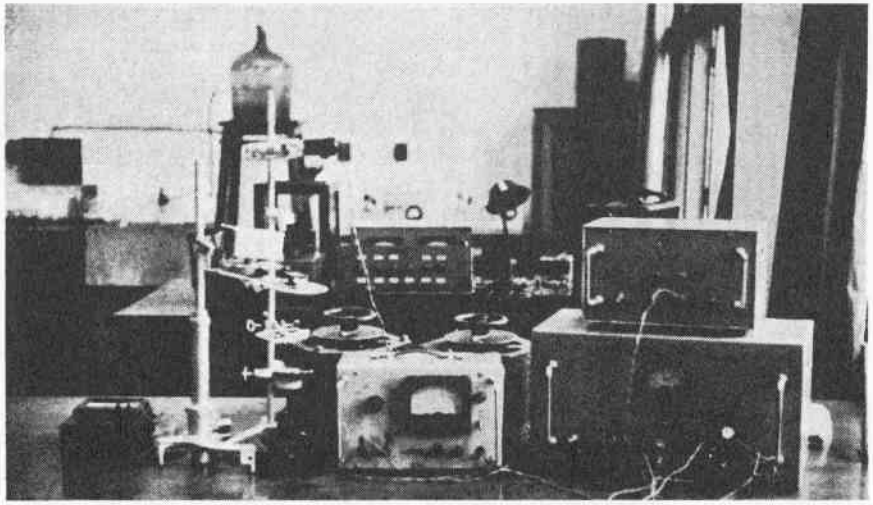


Fig. 5. Equipment in the 4th-year physics laboratory, Fu Tan University, Shanghai.

Fig. 6. Yu Fuh-jou, a peasant scientist, demonstrates his seed germination experiment at the Agricultural Research Institute, Nanking. On the wall are displays showing common plant diseases.

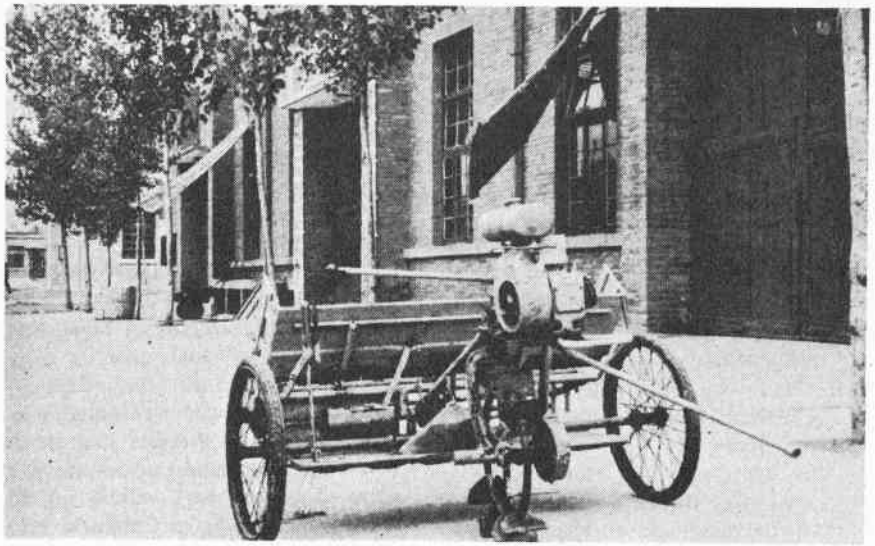


Fig. 7. The rice-seedling transplanter designed at the Agricultural Mechanization Research Institute, Nanking.

Fig. 8. The cable-towed plough designed at the Agricultural Mechanization Research Institute, Nanking. Here the winch on the boat is powered by an electric motor.

dents working in pairs on most experiments. In the 4th- and 5th-year laboratories I saw experiments in progress in molecular spectroscopy, with all the apparatus built by the University staff. I also saw a Zeiss microphotometer and 5th-year students studying emission spectra with a Raman spectrometer. There was Japanese equipment for the study of molecular absorption spectra, as well as several laboratories devoted to metal physics.

Another clue to standards can be gained from the academic achievements of those Chinese students from the Mainland who have later studied an experimental science at the University of Hong Kong.

The University of Hong Kong is modeled after British universities; English is the language of instruction. In science the university offers a 3-year course leading to a General Honours B.Sc. degree, plus a 1-year Special Honours B.Sc. degree. These degrees are recognized in Britain as of equivalent standard to those of a British university, and an external examiner, usually from Britain, assesses all examination papers and scripts for the degree. The university may admit students from other universities for the 1-year Special course if the head of the department concerned and the University Senate regard them as sufficiently qualified. In the chemistry department this Special course consists of advanced courses in all branches of chemistry (these resemble the 1st-year course for the Ph.D. at a U.S. university) plus experimental work which, since the 1961–62 session, has consisted of a research project in one branch of chemistry, on which the student writes a thesis.

Professor J. Miller, head of the chemistry department, admitted to the B.Sc. Special course in the period between 1960 and 1964 a number of graduates from other universities, including eight students who had previously studied at universities in Mainland China, and five more have been admitted to the current session. The achievements of these students are shown in Table 2 (*4*).

The sample is too small to permit one to draw firm conclusions from these results, and in assessing their significance the following factors must be borne in mind: (i) the date of graduation from the university in Mainland China and the time which had elapsed between that date and admittance to the University of Hong Kong; (ii) the type of work done in the intervening years; (iii) the problem of language difference, especially in a 1-year course; (iv) the fact that the students with the highest achievement had gone to a secondary school in Hong Kong before going to China for higher education. Nevertheless, the results do indicate that students trained in universities in Mainland China can fit satisfactorily into advanced-degree courses at a university with British standards.

Research Institutes

Only in Nanking was I able to visit research institutes. For permission to do so there I am indebted, I think, to the fact that few tourists visit Nanking, as compared with the many who visit Peking and Shanghai, and to the particularly obliging manager of the China International Travel Service. He said, "If we show universities and communes to most tourists they accuse us of ramming propaganda down their throats. They want to see museums and relics of the Old China; I'm glad to arrange for you to see something of the 'New China.' "

Two of the institutes were branches of the Chinese Agricultural Academy, and one was an institute of the Academia Sinica. All three were concerned with the improvement of agricultural production. It seemed that the overall objectives of each institute are determined according to a "united plan" worked out by the State. Their terms of reference are, however, quite broad. For example, the main task of the Kiangsu Branch of the Chinese Academy of Agricultural Science is to "solve the problems of agricultural production encountered in this Province." The Mechanization Research Institute had as its objective "to do research to find the types of machinery most suitable for paddy rice production," and the Academia Sinica's Soil Science Research Institute was directed to carry out "basic studies related to improving the fertility of poor soils, especially saline, alkaline and red soils."

The scientists work out their research projects according to these terms of reference. In the case of the Kiangsu Branch of the Chinese Academy of Agricultural Science the working out of research priorities involves close liaison with branch institutes scattered throughout the province, and with the peasant scientists in the communes. The Soil Science laboratory, however, does more basic research, and the scientists seemed to have considerable say in their research program. In all instances the program has to be sent to Peking for approval.

Chinese Academy of Agricultural Science, Kiangsu Branch. This research institute has eight departments: food crops; fiber and oil crops; crop protection; soil science; horticulture; animal husbandry and veterinary; plant physiology; and agricultural physics. In addition there are two pedagogical research groups: agricultural economics and agricultural methodology.

There are 300 research workers plus 100 assistant researchers and four peasant scientists. Affiliated with this academy are seven agricultural scientific research institutes, one in each of seven districts within the province; two institutes for research on vegetables; one institute for research on poultry; and 17 experimental stations, one in each of 17 counties in the province. Altogether in these 28 institutes and stations there are more than 1000 research workers.

A particularly interesting feature of this institute and of its 27 affiliated institutions was the use of peasant scientists (Fig. 6). There are peasants who have no scientific training but have demonstrated an ability to innovate and have found "what works" in their home area. At the top level, as in Nanking, there were very few of these men. The work going on was clearly professional scientific work carried out by university graduates. But in the agricultural extension work considerable use was made of the peasant scientists. They act as a go-between, and their empirical knowledge is sometimes of use to the professional scientists. For example, in 1963 some 90,000 peasants visited the institute's experimental field in Soochow to see a demonstration of a new technique for growing rice which was attributed to a peasant scientist. However, his method had first been given a thorough scientific analysis at the Nanking institute before his ideas were promulgated.

As an illustration of the work of the Nanking institute, I was shown the pest-control laboratories in the crop-protection department. There, research on the life cycle of various insect pests is carried on, and a search is made for the most appropriate insecticides. There were 41 research scientists working in this department.

Nanking Agricultural Mechanization Research Institute. This institute was established in 1957. On the wall of the committee room is a quotation from Mao Tse-tung: "The basic road for our country's agriculture lies in mechanization." There are four laboratories: electric-cable-towed plough, plant pro-

tection, plant transplanting, and machine repair.

One hundred researchers work in this institute. They not only design new agricultural machinery, but also advise on the application of machinery and select machinery for specific problems. So far the institute has designed three types of machines which have been thoroughly tested and for which blueprints have been sent to the factory. I was shown all three.

The first is a machine for transplanting rice seedlings (Fig. 7); it can be adjusted to plant from 3 to 11 seedlings in each 20-centimeter square. It has a 2-horsepower motor, and, with it, five people can plant 1 hectare in a day (it takes 30 people to plant 1 hectare of rice in a day without a machine). I was told that the machine is exported.

The second machine is an insect sprayer. Basically it consists of a pump which draws water from an irrigation canal, mixes an appropriate amount of insecticide into the water, and then sprays the mixture over crops.

The third machine, and by far the most interesting, is the cable-drawn plough (Fig. 8). This is for operation in swampy ground, preferably ground covered with water to a depth of 10 to 15 centimeters. I watched it being demonstrated in a field outside the institute. At either end of the field was a punt-like boat on which was mounted a winch (powered by either an electric or a diesel engine). The plough was attached by cable to both winches and was simply pulled back and forth across the field. The boats were anchored and, by means of another winch, could be moved a furrow's width at right angles to the furrows after each traverse. The plough moved quickly, at 2 meters per second, and I was told that up to 6 mou of land could be ploughed per hour (15 mou equal 1 hectare).

The director of the institute, Ko Jie, was one of the very few scientists I met in China who was willing to speak to me in English. He said I was the first Englishman ever to have visited his institute. He personally demonstrated the cable plough, which he claimed is now in mass production.

Soil Science Research Institute. The Academia Sinica's Soil Science Laboratory in Nanking was the best-equipped scientific research laboratory that I saw in China, and compared favorably with anything I have seen elsewhere in Asia. I was given the usual political introduction, into which Mr. Chan, the director, crowded a great many slogans: "Under the three banners . . . ," "Rely on our own efforts . . . ," "Let 100 flowers bloom and 100 schools contend . . . ," and so on. In the midst of this political verbiage were some facts. I learned that there were more than 300 university graduates working in the institute, which has six divisions: soil geography, soil agrochemistry, soil physical chemistry, soil biochemistry, soil biology, and soil physics.

I was shown around many different laboratories. In each laboratory the project leader explained the work in progress. I noted that, although many of the scientists could read English, most were very reluctant to speak it. We visited the library, which, I was told, contains 60,000 volumes. There was a separate room for current journals; I estimated that there were about 300 journals on the racks, from all over the world. I noted British, American, Russian, French, and German journals; all appeared to be originals rather than photocopies. One American journal which I picked up at random was the July 1964 issue (it was

then October). There were many Russian and English-language books in the library. Also I noted, as we went around the laboratories, that each scientist nearly always had on his desk a few of the latest English and American books on his specialty. In addition, about half the scientists also had a copy of one of Mao Tse-tung's political books.

The equipment in this institute came from all over the world. I saw a Tinsley polarograph bought in 1957; Czechoslovakian and Russian spectroscopes; a British centrifuge, super-speed MSE; and equipment, made in the institute's own factory, for measuring the electrical conductivity of soils. I was shown equipment for differential thermal analysis; a German Zeiss microscope; a superbly equipped x-ray room with Japanese, Dutch, and East German equipment; and a special laboratory for using radioactive isotopes. The factory attached to the institute had 25 workers and was used mainly for instrument repair. Although I was unable to assess the scientific merits of the research work, there was a sense of purpose and enthusiasm which marked this as a first-rate institution.

Scientific Instrument Factories

I visited two scientific instrument factories, one, in Nanking, which manufactures teaching apparatus, and the Medical Instruments Factory in Soochow. The Nanking factory produces 102 different kinds of optical and electrical apparatus. Another apparatus factory, in Wuhan, produces equipment for teaching zoology and botany, and a third, in Shenyang, makes apparatus for courses on heat and mechanics. The Nanking factory has 1400 workers and staff members and 400 machine tools; it occupies floor space of 50,000 square meters.

The manager of the factory, Jang You-shyr, stressed on several occasions that the work had been done without aid: "If there had been aid the work would have been done more quickly." In 1958, he said, the management decided to make electron microscopes and asked some visiting Czechoslovakian experts for help. The Czechs looked at the machine tools in the factory and said it was impossible; their factory in Czechoslovakia, which had many modern machine tools and expert workers, had produced only three electron microscopes in 7 years. The Chinese determined to prove they could make such microscopes, and within a year they made their first model. They have now constructed 20, and I saw another five in various stages of construction. The microscopes have a magnification of 20,000 and sell in China for 60,000 yuan ($25,000).

The Nanking factory also makes biological microscopes, metal-structure microscopes, stereoscopic microscopes, geological microscopes, slide rules, stereopantometers, astronomical telescopes, electrostatic generators, machines for studying moon and earth motion, induction coils, hand-driven generators (alternating-current and direct-current), and a variety of ammeters and voltmeters. Optical glass used to be imported from Germany but the Nanking factory now produces it.

In addition to the electron microscopes I saw the ammeter assembly room. The meters were simple but looked robust. During my month in China I visited six middle schools (three were in communes and three in cities) and each had equipment made in this factory.

The Medical Instruments Factory in Soochow makes 391 different kinds of surgical instruments, especially for gynecology, obstetrics, and eye, nose, and throat surgery. The notable feature

about this factory was the way it had pulled itself up by its bootstraps. Many of the machines and processes had been built and designed by the workers themselves. For example, they themselves had made, for 40,000 yuan, equipment for a steel-tempering process which would have cost 80,000 yuan to buy. The cadres (officials) are required to spend 1 day a week in manual labor in the factory, and the department heads and the factory manager must all spend half of every day working in the factory.

To my inexperienced eye the factory seemed crude and working conditions seemed much below the standard of the Nanking factory. However, the finished products, while below Western standards, met international specifications and were exported to countries in Asia, Africa, and Latin America. The factory had won many awards for self-reliance and high standards, and the factory management, while freely admitting that they still had a long way to go to catch up with Western technology, was obviously pleased with the achievements.

My view of Chinese science was no more than a tourist's glimpse. However, I have talked to a number of scientists who visited China on the invitation of the Academia Sinica and spent their time with professional colleagues. They report that those who could speak English spoke to them quite freely in English and discussed their scientific work with complete frankness. The Chinese are the first to admit they are still a long way behind advanced world levels, but most visitors seem agreed that the scientific atmosphere was relaxed. I was impressed not so much by what has already been achieved—China is still a poor country—as by the solid educational foundation she is laying for future development.

Significant as the growth of genuine science may be, perhaps even more significant may be the efforts that are being made to bring science to the Chinese people. Caryl Haskins (*5*) has pointed out that in Britain, before the scientific revolution, people made decisions on the basis of intuition and faith. After it, they made them on the basis of reason. The consequences for the world were profound. The majority of people in the less developed parts of the world have not yet experienced a scientific revolution. They still make decisions on the basis of superstitions, faith, and intuition. During the past year I have visited many Asian countries and have discussed the problems of scientific development with the leading scientific administrators in those countries. Almost all said that one of their biggest problems was to create a science consciousness among the people. Many of these countries have first-rate scientists and scientific laboratories, but the fruits of science are not having the impact on the development of the countries that they should have. One of the main reasons for this is the unscientific attitude of the people.

One must be very cautious about overgeneralizing, but everywhere I went in China, in both city and commune, I noted a tremendous enthusiasm for science and innovation. Every commune I visited (seven in all) had its own experimental plot, and two had their own research institutes. The level of work and the standard of innovation is not high, and there is evidence that many mistakes have been made when this spirit of research and innovation has gone too far, without technical knowledge to back it up. But as the technical capability of peasants, workers, and political cadres increases, so the number of successful innovations must be expected to increase.

Everywhere I went in China I was told about the importance of combining theory with experiment. It was this constant repetition of what seems so obvious to a person schooled in the Western tradition that made me recall Haskins' words about scientific revolution. It was only after scientists such as Bacon and Newton demonstrated the importance of combining theory and experiment that the scientific revolution took place in Britain. In the old China the two were never combined; for China this is a new concept, and I believe it marks the beginning of the Chinese scientific revolution.

References and Notes

1. J. T. Wilson, "Geophysical Institutes of the U.S.S.R. and of the Peoples Republic of China," *Trans. Am. Geophys. Union* **40**, No. 1 (Mar. 1959); *Sciences in Communist China* (AAAS, Washington, D.C., 1961).
2. "Liberation" refers to the Communist victory in 1949.
3. This passage is taken verbatim from the notes I made from the interpreter's translation of Mr. Wang's speech. I apologize to Mr. Wang, and to the other Chinese who so kindly showed me around their institutions, for any errors and misquotations in this report.
4. The information on which Table 2 is based was supplied by Professor J. Miller.
5. C. P. Haskins, *The Scientific Revolution and World Politics* (Harper and Row, New York, 1964); Report of the President, Carnegie Institution of Washington (1961).
6. Table 1 is based on statistics supplied by university officials at each university during the introductory talks.

The author, who lives at 27 Lugard Road, The Peak, Hong Kong, is a geophysicist, formerly affiliated with the Standard Oil Company of California.

Table 2. Academic achievement and graduate careers, at the University of Hong Kong, of individual students who, after obtaining a degree in chemistry from a university in Mainland China, obtained the B.Sc. Special Honours degree at the University of Hong Kong.

University in Mainland China and date of graduation	Achievement at Hong Kong in work for B.Sc. Special Honors degree	Subsequent academic career at Hong Kong*	Remarks
		1960–61	
Sun Yat Sen (1953 or 1954)	3rd-class honors	Has since obtained M.Sc.	
		1962–63	
Sun Yat Sen (1949)	3rd-class honors	Now completing work for M.Sc.	
Shantung (Tsingtao) (1956)	2nd-class honors lower division	Now completing work for M.Sc.	
		1963–64	
Sun Yat Sen (1959)	2nd-class honors upper division	Now enrolled for M.Sc.	Secondary schooling in Hong Kong
Sun Yat Sen (1956)	3rd-class honors		
Sun Yat Sen (1959)	1st-class honors	Now enrolled for Ph.D.	
Fu Tan (1961)	2nd-class honors lower division	Now enrolled for M.Sc.	
Sun Yat Sen (1960)	1st-class honors	Now enrolled for Ph.D.	Secondary schooling in Hong Kong
		1964–65	
Fu Tan, Sun Yat Sen, Tientsin	Results (for 5 students) not available until June 1965		

*The M.Sc. degree of the University of Hong Kong is a 2-year research degree.

Table 1. Statistics relating to universities visited in eastern China (6).

University	Date of founding	Students (No.)	Teaching staff (No.)	Duration of courses (yr)	Departments*	Time spent in study of politics by all students	Research students (No.)	Floor space (m^2)	Books in library (No.)	Days spent in labor per year
Nanking	1902	(1949) 600; (1964) 6000	(Before 1949) 200; (1964) 1000	5	Chinese language, foreign language, history, politics, physics (1100 +20), chemistry (700) geology (600), mathematics, geography, biology, meteorology, astronomy (200 +5)	3 periods per week, plus reading and discussions	100	?	?	30
Fu Tan, Shanghai†	1905	(1949) 2000; (1964) 5000	(Before 1949) 200; (1964) 1000	5	Chinese language, foreign language, history, journalism, philosophy, economics, politics, mathematics, physics, chemistry, biology	Natural scientists, 10%; social scientists, 20%	180	160,000	1.1 million	35
Sun Yat Sen, Canton	1924	(1952) 994; (1957) 2000; (1964) 4300	(1952) 202; (1958) 380; (1964) 750	5	Chinese language, foreign language, history, philosophy, geography, mathematics, biology, chemistry, physics (900)	Natural scientists, 12%; social scientists, 18%	?	120,000	1.65 million	½ per week plus some time at harvest
Hangchow Agricultural	1910 (School) 1952 (Univ.)	(1952) 200; (1964) 2500	(1964) 420	4 and 5	Agriculture, plant protection, soil and fertilizer, horticulture, tea planting, sericulture, agricultural mechanization, livestock and veterinary	10%	Few ‡	80,000	220,000	?

* Initial numbers in parenthesis are number of undergraduates in the department; numbers following plus sign are numbers of postgraduate students.
† At Fu Tan University 70 percent of the students are in the science departments. ‡ For example, the soil and fertilizer department has three.

CHINA'S CONGRESS— COLLECTIVE LEADERSHIP

ANNA LOUISE STRONG
Letter From China January 25 1965

The National People's Congress of China, which met for a fortnight at the turn of the year, from December 20, 1964 to January 4, 1965, is the highest organ of state power in China. It is the fashion of the West to call all power in socialist nations "totalitarian" and all government organs "rubber-stamps". Members of Congress whom I know in China have a different view. They think they work very hard and that they have considerable responsibility of power.

One of these Congress members, who lived in the United States for many years, tells me that China's Congress is "the most representative parliament on earth". He adds that it is "very democratic in procedure" and "very distinguished in personnel". "Few of the members are professional politicians; we earn our living in hundreds of different callings." The most distinguished men in every calling — in farming, in mining, in teaching, in science — are likely to land in the Congress if they have also a sound social sense and revolutionary spirit.

He gave examples. The present Congress is the third to be elected; its term runs for four years. The recent December-January session was its first session. It has been greatly enlarged; previous Congresses had only a trifle more than a thousand members; this Congress elected 3,040. The reason for the expansion is that the country's life has very greatly developed in all fields so that more kinds of work and more kinds of people need representation. The first two Congresses consisted largely of men and women who made the revolution. But now a new generation is appearing, bringing new revolutionary ideas, for the revolution in production, in scientific achievements, in class struggle under the new socialist conditions of the countryside.

This "Third Congress", says my friend, "has an element of 'grass roots freshness' which is very practical and full of energy. This is because the expansion of membership has tripled the numbers by adding fresh minds direct from the farms or the mines or the laboratory." "Model peasants", "model workers", scientific personnel in all

fields of endeavor who have scored signal achievements of benefit to some part of the nation are chosen to the People's Congress in order to expand the application of their ideas. The workers and engineers who opened the famous Taching oil field developed some brilliant techniques not yet revealed to the public but useful to oil workers in other fields. The peasants in Shansi who made the Tachai Commune famous for the self-reliance with which they changed poor hilly land into fertile terraces, also supply representatives to spread their techniques.

The examples my friend gave came from neither of these fields. He noted a vegetable saleswoman from Shenyang in her late twenties, elected by the Shenyang Municipal Congress to the National People's Congress. WHY? To say that she was a "model worker" and a careful student of Chairman Mao's writings means little outside China. Perhaps it means more to report that she studied her job, came firmly to the conclusion that people who consider vegetable-selling a menial task had "feudal ideas", that "any work that serves the people is honorable if well done". She studied her customers' needs. Presently, when new kinds of vegetables appeared which her customers did not know how to cook, she studied cooking in order to help them. Soon she was organizing 400 vegetable sellers in a cooking class so that the housewives of Shenyang might know how to cook new kinds of vegetables.

The people in her ward elected her to the municipal congress, which again elected her to the National Congress. She had become a "leader" and was in line for advance, both in vegetable-selling and in politics.

Another new Congressman is a man about forty. Demobilized after the Korean War, he decided that he could best serve the people by teaching school in distant places. He went to the hills where schools were few. He gradually learned that the reason few children attended school was first, that the schools were too far from their homes, and second, their parents were poor and needed their work. He finally developed a system of "mobile schools" that carried education closer to the homes, and taught during the children's slack seasons in work. The people in his area thought his idea worth spreading; they chose him to the National Congress to spread it.

Mao Tse-tung is also a member of the Congress, chosen by the municipality of Peking. The youngest deputy is 21 years old, the oldest 90. There are 542 women members, nearly one-fifth of the total. Former serfs and slaves from Tibet, who helped smash chains and became masters, were first elected to their local governments, and thence to the Congress in Peking. The Panchen Lama,

who came to previous Congresses as a leading representative of Tibet and thus was elected as a vice-chairman of the Standing Committee of China, was not elected this time because of strong opposition by former serfs who revealed very evil deeds on his part. But he was made a member of the People's Political Consultative Conference.

When all these deputies come to the Congress, what is their power? They have the power to amend the Constitution and to enact basic laws. They elect the President and Vice-President of China; the Standing Committee of the Congress, which is the chief state power between sessions; the head of the Supreme Court and the Chief Procurator. They do not elect the Premier, but they confirm him after he is chosen by the President; they also ratify the various ministers after these are chosen by the Premier. They confirm the members and vice-chairmen of the National Defense Council, whose chairman is ex officio the chairman of the Republic, Liu Shao-chi. The Congress also decides the general lines of the National Economic Plan and of the State budget. They decide questions of war and peace.

How do they decide such matters? What power, actually, has a vegetable seller from Shenyang in matters of state? More than you might think.

First, "Nobody can silence a Congressman," says my friend who holds this position. "Anything he wants to say is going to be heard. Naturally 3,000 people cannot all be heard by the full Congress; limits of time prevent. But most of the session is given to small group meetings; we first divide by provinces, and then into still smaller groups on various subjects. Everyone gets a chance to be heard. People who wish their views heard more widely bring them in written form and these are distributed. During the sessions we spend mornings and afternoons in discussion and evenings reading documents.

"This discussion is very frank and democratic. That is why we have closed sessions, so that we may speak frankly about all mistakes and shortcomings, without having them published abroad. The Congress is a liberal education. When it is over, you feel acquainted with every part of the country and with very many of its problems. You also have had a chance to give your views."

For secondly, no decree, no report, no important public statement is ever issued in China on the word of a single person. This has been true since Yenan days. A friend of those days recalls how, before the Communists had adequate printing facilities, long scrolls would be passed around of some projected pronouncement, crossed and criss-crossed by suggested amendment. "Experts would think they knew which corrections were by Mao, which by Chou En-lai, which by Liu Shao-chi." This practise of collective compilation continues still.

Chou En-lai's speech to the recent Congress is an example. It went through twenty drafts before any of it was published to the world. It reached the National Congress marked "Eighteenth Draft"; this meant that it had passed through the State Council, the Party Central Committee, and many other places, each entitled to make suggestions for amendment. The Congress printed three versions, before, during and after the actual delivery of the speech. The committees of the Congress discussed the speech for several days, both before and after it was delivered. The speech from which the condensation was finally made for publication was the Twentieth Draft.

Each of these drafts remains Chou's speech; he is not compelled to accept any amendments. "But our leaders are capable of knowing good ideas when presented," said my friend. "If they weren't, they would not have become our leaders." Every draft is Chou's, but the final draft is also the work of tens of thousands of responsible people, each of whom was chosen representative of other tens of thousands. It is therefore the voice not only of Chou En-lai but of the people of China, and especially the most active, socially-minded part of the people.

"We believe," said my friend the Congressman, "the more widely all national measures are discussed, the better. This is why we have the Political Consultative Conference meet at the same time as the Congress but not in the same hall. It is selected on a professional basis and contains representatives of all religions, of writers, artists, the national bourgeoisie etc. Its comments have no legal force but are always taken into account by the Congress. Decisions of the Congress, of course, have force of law."

CHINA'S LEADERS AS I HAVE KNOWN THEM

Chu Teh, now Chairman of the Standing Committee of the National People's Congress, was the first of China's top leaders that I met. In early 1938 I visited his headquarters in southwest Shansi where he commanded the famous Eighth Route Army's anti-Japanese resistance from a hill village. At that time I also met Lin Piao and Ho Lung, division commanders who came across enemy lines to a military conference; today they are both Vice-Premiers and Lin Piao is Minister of Defense. I met Chou En-lai that same year in Hankow but saw little of him; later in 1941 in Chungking he gave me several long interviews that made a bit of history in New York. I did not meet Mao Tse-tung or Liu Shao-chi till 1946 when I went to Yenan. At that time I remained many months, visited many "Liberated Areas", became acquainted with general policies and practises of the Chinese Communists. It was this visit that made me decide that I wanted to return to China, perhaps for the rest of my life.

I was deeply impressed by the integrity of all the Chinese leaders, by their complete devotion to the cause of liberating China, by the intelligence and collective wisdom which they developed by constantly analyzing both successes and mistakes and learning from both. I was also impressed, having lived for more than twenty years in the USSR under Stalin, with the fact that the Chinese did not execute, or even expel, the people who made the mistakes; they kept the mistaken comrades in their ranks and expected them also to learn from the mistakes. Thus they developed both a collective wisdom and a remarkable unity.

The present leaders of China have held state power in greater or less degree for more than 30 years since their first small governments in Kiangsi and other revolutionary bases. They have longer experience in governing than any other group in the world. Throughout these years they have maintained their unity and added to their collective experience. This has enabled men of ability to rise steadily in power and also increase in knowledge. They have also developed techniques for keeping in touch with the needs of the people.

For all these reasons, for their integrity, their devotion, their unity, long experience and close relations with the Chinese people, I believe the Chinese leaders are more fit to lead a great nation than any other group of leaders in the world. And because of what they have already accomplished with one-fourth of the human race with a maximum of planning and a minimum of violence and war, and because they seek on a world scale the conditions of a durable peace, I would trust them more than any other leaders I know to act fairly and wisely towards the common destiny of mankind.

Should Canada Trade With China?

An address presented by J. RUSSELL LOVE of Edmonton, Alberta, to the Annual Businessmen's Weekend and Alumni Reunion of the Banff School of Advanced Management, held in Banff, Alberta, March 11 to 13, 1965. The general theme of this year's program was "OPPORTUNITIES AND RESPONSIBILITIES FOR EXPANDING CANADIAN TRADE."

Few countries in the world depend so much on foreign trade, as the key to their prosperity, as does the Dominion of Canada. Our sparsely settled population stretches from ocean to ocean, along a narrow fringe adjoining the wealthiest nation in the world. We look to our southern neighbor for capital to develop our resources and to provide a market for the products of our primary industries. Our basic source of wealth has for many years, come from our mines, our forests and our rich agricultural lands. Only recently has the production of petroleum products played a major part in our economy.

Our exports have never been sufficient to meet the cost of our imports, plus the interest payments on foreign loans and the dividends on foreign capital invested in our industries, most of which comes from the United States. As our Canadian economy prospers and expands, so does the need for foreign capital increase. Hence Canada's adverse balance of payments grows worse year by year. With a prosperous economy, as we are now experiencing, imports increase, prices rise and export markets become more difficult to secure and hold.

Until 1961 our economy was not healthy. Our imports exceeded our exports. We stock-piled our surplus grain because we could find no markets that would buy it. Unsold grain does not help our economy. It is only of value when it is turned into cash. Until 1961 we practically sold no grain to communist countries. From 1961 to 1964, our sales of wheat to communist countries have amounted to 540 million bushels, worth about one billion dollars to our Canadian economy. Since these sales were at least 20 times greater than our imports from communist countries, the effect on our economy has been tremendous.

It is a strange paradox, that the people who have helped to make the past five years so prosperous for the people of Canada, are the people we do not recognize. The people whom we are supposed to look upon as our enemies and are not yet qualified to be accepted as members of the United Nations.

Chart 1 shows Canada's wheat exports to communist and non-communist countries on a three year average basis for two periods, 1958 to 1960 and 1961 to 1963. While sales to non-communist nations are slowly declining year by year, the sales to communist countries are steadily increasing.

Chart 2 shows Canada's wheat exports to the various areas of the world since the end of World War II. The averages are for the three six year periods, namely 1946 to 1951, 1952 to 1957 and 1958 to 1963. Year by year, the United Kingdom, our most important market, is buying less and less wheat from Canada. The rest of Europe, that only started to recover from the chaos of World War II, after the Marshall Plan was set-up in 1948, is just holding its own as a market for Canadian wheat. The North, South and Central Americas are buying less year by year. Africa is of no importance to Canada as a wheat market. Our hope for expansion is in Asia. The average yearly sales to this area have increased from 23 million bushels in the first six year period to 50 million bushels in the second six year period and to 97 million bushels in the period from 1958 to 1963.

Chart 3 shows wheat sales to our main customers. It shows the average for the 1958 to 1960 period and for each year since 1960. The average for the 1961 to 1964 period shows a yearly decline in purchases by the United Kingdom of ten million bushels. The average of 51.1 million bushels for China places her next to the United Kingdom, as our best wheat customer, followed closely by Japan with an average of 49.8 million bushels. West Germany, our fourth best customer, shows steady improvement. The Soviet Union, with a gigantic purchase of 234 million bushels in 1964, cannot be considered as a regular customer based on one year's record.

Chart 4 shows China's foreign trade situation. It is important because many people say that we should not be trading with China. It not only displeases our southern neighbors, but we are told that China has exhausted her sources of foreign exchange needed to pay for Australian and Canadian wheat. We are told that to continue to sell to China can only end in disaster. This chart reveals that China's foreign trade position is on a much sounder basis than our own. When her debt to the Soviet Union is paid off this year, China will have practically no interest to pay on any foreign loans. Her exports, year by year, are well in excess of her imports. Both her economy and her currency system are sound and stabilized. Her trade used to be mostly with the Soviet Union. Since 1960, China's trade, as the chart indicates, has been decreasing with communist nations. The 1963 figures show a total trade, imports and exports, of 627 million dollars with communist nations and twice that amount 1296 million dollars with non-communist nations.

I have been reminded that, compared to Canada's trade figures, China's imports and exports are very insignificant. The American policy to isolate China from the rest of the world has forced her to become more and more, a self-contained nation. This policy of the United States has had the effect of forcing China to become industrialized at a more rapid rate than would be the case, if she were not so restricted by the world's greatest trading nation. A fully self-contained nation needs neither exports nor imports.

Chart 5 shows the top ten nations selling to China. If figures were available respecting Cuba, Cuba might be among the top ten. Of these ten, only the Soviet Union is a communist nation and its sales to China in 1963 were only half of the 1961 sales. Australia and Canada alternate between second and third place. Australia's sales to China are mainly wheat and wool, while the main sale of Canada is wheat. Japan is the keenest nation seeking to develop trade with China. Sales are increasing year by year, from 16 million in 1961 to 62 million in 1963. In the first nine months of 1964, Japan's sales to China were 107 million dollars and her purchases reached 112 million dollars. At the opera in Canton, during the Canton Trade Fair, I sat next to the manager of a department store in Tokyo. He told me that trade between Japan and China is as natural and inevitable as trade between Canada and the United States, which now surpasses seven billion dollars. He said that in the interests of improved agriculture, China was prepared to buy all of the fertilizer that Japan could make available for export. Japan has recently announced a major sale to China of several hundred high-powered bulldozers and motorized graders. In our travels in China we saw no modern road building equipment being used. This is just one example of the trade possibilities that await the salesmen from Western nations who go to China seriously looking for business.

British Trade Fair in Peking

Trade fairs have been held in China by both Japan and the United Kingdom, but the British Trade Fair held in Peking last November, 1964, was a gigantic affair. Some 230 British companies, together with 47 technical publishing companies, displayed capital

equipment, plant, machinery and scientific instruments for industry and agriculture.

The value of the exhibit was over one million pounds sterling. It took 15 months to prepare the exhibit and it cost 750,000 pounds to ship, and mount the display in Peking. 330 representatives of British companies, 75 interpreters and 129 technically qualified persons were in Peking to explain the various exhibits. 100,000 specially selected Chinese technical experts, officials of the Ministries involved with trade and purchasing representatives attended the Fair.

Mr. L. S. Ross, the British representative in Peking, assessed the value of the exhibit to British industry in these words: "Firstly, it was a massive piece of prestige advertising and like all such advertising, it was expensive. Secondly, it brought together an unparalleled number of British businessmen in contact with the appropriate Chinese officials. At best this led to immediate co-operation, either in sales or increased knowledge of Chinese requirements and British ability to fill them. Thirdly, there was the impact which this massive display of British technological achievement had on Chinese buyers. Finally, there can be no doubt that the timing was perfect. It was the fourth British exhibition in Peking within a 15-month period. It has marked a build-up in the commercial relations between the two countries. It occurred at a moment when China is aiming to expand her commercial contacts with the West and when she has simultaneously more money in her pocket to give substance to such a policy. This highly successful exhibition has been beyond all else a shop-window for British products and has shown that what China wants, Britain can supply."

Mr. Brian Rootes of the Rootes Motor Company of Britain, had this to say: "We sold our display for 9,000 pounds which is not significant in itself. What really counted was the feeling of goodwill and the prospect of more sales to China in the future. The exhibit we sold included a small bus, a refrigerator van, a five-ton truck and some passenger cars. Our company has been trading with China since 1957 developing trade in Humber and Hillman cars. We have delivered already 300,000 pounds worth of cars to China. Last year a new-type Hillman was produced in the hope that its small size, low price and ease of assembly would make it attractive for the Asian market. We would like to see the Chinese state-owned factories assembling our products in China. Our company has submitted plans to the Chinese government in this connection. We have tested Chinese made tires, batteries and paint and are satisfied they can be used in our vehicles."

The market in China is wide open to the business interests of the West. The British, the Japanese, the French and others, are all there competing for it. Canadians can not hope to get a fraction of this business by staying at home. The size of the business is indicated by the following industrial plants recently purchased by China. Two Vinylon plants from Japan costing 50 million dollars. A seven million dollar Urea plant from Holland. A 13 million dollar polyethylene plant and a seven million dollar fertilizer plant from the United Kingdom. A fertilizer plant and a petroleum refinery from Italy costing 16½ million dollars. An oil cracking plant from West Germany costing 12½ million dollars. Deals in the process of being finalized include a paper mill from Sweden, a refinery from France and a number of industrial plants from the United Kingdom.

China's Foreign Exchange

One question on everybody's mind is, where does China get the foreign exchange to pay for the huge purchases she is making from Western nations? One brief survey of Hong Kong provides part of the answer. Most of the food required to feed the four million people in Hong Kong comes from China. When Hong Kong needed more water China supplied it. Much of the building materials required in Hong Kong come from China. Since Hong Kong is really a Chinese city, it is not surprising to find that China owns two of the largest banks in Hong Kong and has interests in many profitable enterprises, such as, insurance companies, apartment blocks, theatres, etc. On the border, China has large modern refrigerated warehouses to serve the markets in Hong Kong. She operates four large department stores in Hong Kong with instalment buying and every gimmick that one might find in Macy stores in New York. From all of these activities, added to her exports to Hong Kong, China receives a net yearly gain of $500,000,000 in foreign exchange. This would about pay for all the wheat she imports from Australia and Canada.

Chart 6 shows the top ten nations that buy from China. Again only the Soviet Union is a communist nation. China's foreign trade policy as stated on the entrance to the Trade Fair Building in Canton reads as follows, "We are always willing to develop economic and trade relations with all countries and supply each other's needs on the basis of equality and mutual respect for national sovereignty." Some interesting facts are revealed by a study of this chart. Next to the Soviet Union, China's two best customers are British controlled Hong Kong and British sponsored Malaysia. Sales to Malaysia increased from 56 million dollars in 1961 to 94 million in 1963. Malaysia's main purchases from China are rice, sugar, textiles, iron and steel products, canned foodstuffs and oil seeds.

One might ask why China sells rice to so many countries when we are told that China cannot adequately feed her own people? This is made possible by her purchases of Australian and Canadian wheat, which in the northern areas of China, is acceptable in the Chinese diet. For example, by buying our wheat, China can continue her rice for rubber deal with Ceylon. This year China will sell to Ceylon 20,000 tons of rice and buy from Ceylon 38,000 metric tons of rubber.

Canton Trade Fair

Before concluding my remarks on trade with China, I would like to briefly report on the highlights of the Canton Trade Fair held in Canton from October 15th to November 15th, 1964. All of the members of our Canadian delegation were impressed with the fair. The fair was first held in 1957 and is conducted twice a year, one month in the spring and one month in the fall.

It is promoted for the purpose of expanding trade with non-communist nations. There were 4,400 visitors and 51 countries represented. There were 20,000 commodities on display. There were 21,000 sales contracts completed by foreign buyers. The total value of the sales was estimated at between 70 and 75 million pounds sterling. The largest delegation was from Japan consisting of 420 members. Some highlights of the fair. Japan was mostly interested in minerals, marine products and agricultural products. particularly soya beans and ground nuts. Britain and Sweden made large purchases of textile goods, mostly piece goods. Other European countries bought chemicals, pharmaceutical supplies, such as, vitamins and antibiotics, musical instruments, toys, clocks and of course textiles.

A Canadian buyer made a substantial purchase of crockery while an Australian representative placed a large order for footballs and tennis equipment. This was a repeat order from a sports conscious nation and would indicate that the sports equipment made in China must be right in quality and price.

Our Chinese Hosts

In conclusion may I say, that the main purpose of the visit of our 32 member Canadian delegation to China last fall was to discuss our trade with China and to meet the people who have bought so much of our wheat since 1960. We were most fortunate to have had as our hosts, the China Council for the Promotion of International Trade. In every city that we visited, the Council sponsored a banquet at which we met with local trade representatives of the Council. Mr. Nan Han-chen, chairman of the Council, is well informed, a delightful host and at the same time, is a man who calls a spade a spade when talking about trade matters.

He told us, as we all so well knew, that international trade must be a two-way street. He said that this means that the countries that buy from China will be given priority in selling to China. He reviewed China's wheat policy, pointing out that after three successive crop

failures due to natural calamities, China needed wheat to feed her own people. Today this is no longer the case. However, in China an acre of land produces, measured in weight, two and one half times more rice than it will produce wheat. So long as wheat can be purchased from Canada on a favourable basis, it will pay China to buy our wheat and sell rice to the rice-eating countries in southern Asia. By so doing China obtains in return, rubber, cocoanut products and other tropical items.

Of course it was most embarrassing for us to be asked why we do not recognize China when we recognize other communist countries? This bothered us as soon as we arrived in Peking where Mr. Hou Ton, vice-chairman of the Council for the Promotion of International Trade was at the station to greet us. In fluent English Mr. Hou welcomed us to China. He is a graduate of the well-known London School of Economics.

It was a revelation to many of us to find that Chinese students have an opportunity to study the English language. I noted recently that twenty-five Chinese students from Peking are spending six months studying the English language and English literature at Earling Technical College in England. The growing friendship between the Chinese and our two mother countries, Great Britain and France, is due to the fact that they both recognize the People's Republic of China. In doing so they have substituted the policy of recognition for the policy of isolation.

Some Observations

As we returned to Canada, we had a feeling that China will not continue as our second best customer for wheat unless our attitude and actions towards China change. Just to say that China has nothing to offer us that we want to buy is not going to retain the China market for our wheat. What about textiles? Millions of dollars worth of textiles are imported into Canada from foreign countries every month in the year. Two-thirds of the Soviet Union's imports from China in 1963 was made up of clothing and textiles. The United Kingdom, that used to be the textile centre of the world, now buys considerable textiles from China.

Australia is our main competitor for the wheat market in China. It is her best wheat market and her second best wool market. What is Australia doing to retain and expand her market in China? On a per capita basis, she is buying four times as much from China as we Canadians are buying. What does she buy? Chiefly, textiles, tea, wearing apparel, tung oil and other miscellaneous products.

Speaking to the Canadian Chamber of Commerce last October, our Trade Minister, the Hon. Mitchell Sharp, urged us to renew our efforts to develop and diversify our trade in non-strategic goods with communist countries. He said: "They are already good customers for our grain. The development of better commercial relations with the state-trading countries poses many difficult problems, but I believe it is in the political as well as the economic interests of the free world to make a serious effort in that direction."

Seven years ago in the summer of 1958, the late Mr. James Muir, president of the Royal Bank of Canada returned from a visit to China. Mr. Muir's published report under the title "The Challenge of China," was widely circulated by the Royal Bank. On the subject of trading with China he urged our exporting fraternity to shake themselves loose, get busy and visit China. He said, "It was galling to meet and to talk with the selling forces of other Western powers, not only obviously getting business but enthusiastic about it while our people seem to sit back and wait for a silver platter deal—Canada needs export trade and it should be sought after everywhere with no interest other than the welfare of Canada involved—I believe there is good and legitimate trade to be done. Other Western people are getting it. Canada will be negligent and unfair to herself if she does not get her share. She won't get it, however, without aggressive action." (end of quote)

Our experience in selling wheat to China has proven that the Chinese are honest traders. They meet their payment commitments on time. They are ready and willing to do business with Canada. If we Canadians, knowing how vital export trade is to our economy, want to get our share of this expanding market, serving one quarter of the world's population, we must act now, before our competitors establish their trade with China on a firm and permanent basis.

Importance of Foreign Trade

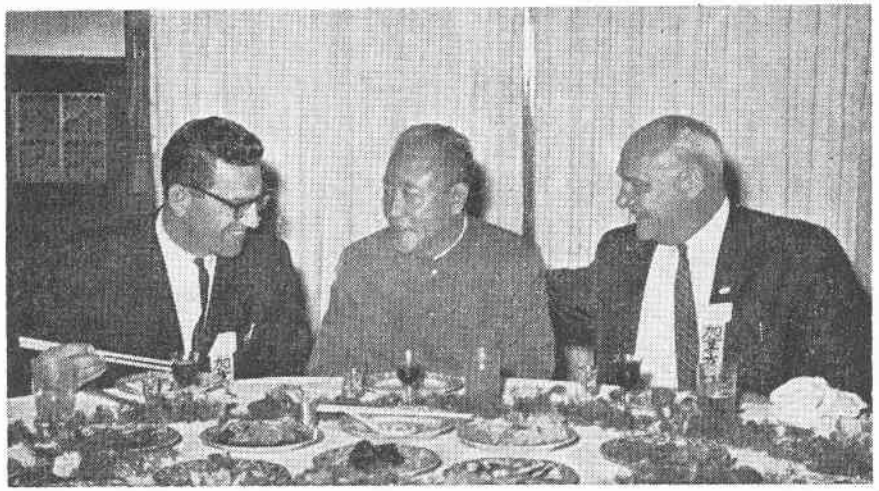
Not only is an expansion of foreign trade vital to the prosperity of Canada, but international trade is the key to the building of a better life for the people of all nations. To trade together, people must get together. When people get together, as the British and the Chinese are doing, mutual understanding develops and co-operation among nations follows. Only fear causes nations to place roadblocks on the highways of free international trade. It is fear that causes nations to stockpile massive atomic murder weapons for the destruction of human beings. We are all members of the human race, and the human race on this planet includes the black, the yellow and the white.

Today the human race is in grave peril. Mistrust and hate keep nations apart. Nations not on speaking terms can not be on trading terms. Through trading together nations learn to trust and to understand one another. The United Nations has declared 1965 "International Co-operation Year." May it truly be a year of co-operation and peace among nations and not a year of conflict and war. To me it was a hopeful sign, as it has been to all Canadians who have visited China, to find representatives from so many Western nations in China for the express purpose of expanding international trade. I returned from China with renewed faith in the concept of the brotherhood of man. In this troubled world the immortal words of Robert Burns, Scotland's peasant poet, ring out a message of hope.

For a' that and a' that,
Its coming yet for a' that,
That man to man the warld o'er,
Shall brothers be for a' that.

SOURCE OF INFORMATION

Wheat Trade — Reports of Canadian Wheat Board.
China's Trade — Far Eastern Economic Review
A weekly Trade Journal Published in Hong Kong



A LIGHTER MOMENT IN A SERIOUS DISCUSSION

Mr. Nan Han-Chen, Chairman, China Council for the Promotion of International Trade, explains to Paul Babey, President of the Farmers' Union of Alberta (left) and Russell Love what wheat means to China's economy.

CHART 1

CANADA'S WHEAT EXPORTS

Millions of bushels — Crop year ending July 31
Three-year average

	1958/60	1961/63	Increase or (Decrease)
Communist Countries	11.4	75.9	64.5
Non-Communist Countries	281.1	267.2	(13.9)
All Countries	292.5	343.1	50.6

CHART 2

CANADA'S WHEAT EXPORTS

To world areas — Millions of bushels
Also percentages of total sales

Average	U.K.	Europe EX. U.K.	Americas N.S.C.	Africa	Asia	Total
1946 to 1951	142.8	41.5	25.2	13.3	23.2	246.0
	58.1%	16.7%	10.3%	5.5%	9.4%	
1952 to 1957	105.7	97.8	39.0	10.6	50.1	303.2
	34.9%	32.2%	12.9%	3.5%	16.5%	
1958 to 1963	94.3	97.2	20.5	8.6	96.9	317.5
	29.7%	30.6%	6.5%	2.7%	30.5%	

CHART 3

CANADA'S WHEAT MARKETS

Millions of bushels — Crop year ending July 31

	Average 1958/60	1961	1962	1963	1964	Average 1961/64
U.K.	99.5	91.6	85.9	89.7	90.8	89.5
China	.2	34.7	72.0	56.4	41.3	51.1
Japan	42.5	55.6	49.1	44.6	49.8	49.8
West Germany	29.8	33.0	44.0	28.0	37.3	35.6
U.S.S.R.	7.4	7.5	—	—	234.0	60.4

CHART 4

CHINA'S TRADE

In Millions of U.S. Dollars
NOTE—1963 figures not final

	1961	1962	1963
Total Exports	1,277.3	1,239.3	1,167.9
Total Imports	1,194.7	922.1	755.9
Surplus Exports	82.6	317.2	412.0
COMMUNIST NATIONS			
Exports	628.0	572.0	432.4
Imports	452.8	266.8	194.8
Surplus Exports	175.2	305.2	237.6
NON-COMMUNIST NATIONS			
Exports	649.3	667.3	735.5
Imports	741.9	655.3	561.1
Surplus Exports Deficit ( )	(92.6)	12.0	174.4

CHART 5

NATIONS SELLING TO CHINA

In Millions of U.S. Dollars

	1961	1962	1963
U.S.S.R.	367.4	230.0	187.7
AUSTRALIA	161.5	97.0	128.6
CANADA	120.9	137.0	97.2
JAPAN	16.6	38.5	62.4
FRANCE	36.4	43.3	57.4
UNITED KINGDOM	36.5	24.1	36.9
CEYLON	17.4	28.0	21.1
ITALY	29.7	19.0	19.3
WEST GERMANY	30.5	31.1	15.4
BURMA	37.2	1.2	14.0

CHART 6

NATIONS BUYING FROM CHINA

In Millions of U.S. Dollars

	1961	1962	1963
U.S.S.R.	551.6	570.0	414.1
HONG KONG	180.0	212.3	259.5
MALAYSIA	56.3	65.9	94.0
JAPAN	30.9	46.0	74.6
UNITED KINGDOM	86.4	64.8	51.9
WEST GERMANY	39.7	39.3	40.8
CEYLON	7.3	8.6	29.0
BURMA	20.6	26.9	25.8
FRANCE	15.9	16.9	20.4
ITALY	12.3	14.1	19.1

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17. China's Path To Her New Society
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