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NEW CHINA HANDS: AMERICAN SCIENTISTS VISIT THE PEOPLE'S REPUBLIC

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From the moment we left the hotel that evening, we were sharply aware of the quiet historical nature of our little visit. As our cars turned left off Tung Ch'ang An Chieh and into the diplomatic area of the city, we could see the American flag flying over the Liaison Office guarded by two alert members of the People's Liberation Army. We entered the building to join what for most of us was an activity which we would consider attending in no other foreign country: a Fourth of July party, given by the Chief of the American Delegation in Peking, David Bruce. The reception was simple with excellent Chinese hors d'oeuvres and fiery mao tai liquor accompanying the conversation. American mixed drinks were also provided, and with a good old gin and tonic (all of us already understood the dramatic effects of 120 proof mao tai), I sat down to talk with Wu Yu-hsun, a vice-president of the Chinese Academy of Sciences, one of our hosts in China, and Al Jenkins, the deputy Chief of the American Liaison Office. Jenkins is an "old China hand" who had spent considerable time in Peking before Liberation in 1949 and had been present at the last Peking Fourth of July celebration 24 years before. He spoke a bit about the contrasts between the old China and the China he now saw. "The thing that has amazed me most," he said, "is that in China today no one is fantastically rich, but no one is desperately poor. When it rained yesterday, everyone had a plastic raincoat. Before 1949 only the rich could protect themselves from the rain."

My presence at that remarkable Fourth of July celebration was possible because of my good luck in being a member of the first American physics delegation to the People's Republic of China. My fellow travelers on this visit were Luis Alvarez of the University of California at Berkeley, Jan Alvarez, Owen Chamberlain also from Berkeley, his friend June Steingart, Murph Goldberger from Princeton University, Mildred Goldberger, their son Joe, Ned Goldwasser from the National Accelerator Laboratory, Lizy Goldwasser, Francis Low of M.I.T., Natalie Low, David Pines of the University of Illinois, and his wife Suzy Pines. Each of us had applied in one way or another to visit China, and the delegation was assembled by the Chinese government at the end of May 1973 and invited to come to China as the guests of the Chinese Academy of Sciences during a period of three weeks in July 1973.

The purpose of our visit was certainly not clear to any of us. The scientific interest among the seven physicists is primarily in high energy physics: three theoreticians (Abarbanel, Goldberger and Low) and three experimentalists (Alvarez, Chamberlain and Goldwasser). Pines has worked as a theorist in both solid state physics and more recently in astrophysics. It goes without saying that we all shared an intense curiosity in both the standard tourist sights of China and the life and culture of the new China. Beyond the very beginnings of a satisfaction of that curiosity and the incredibly often repeated announcement that our

visit served "to enhance the mutual understanding and friendship between the people of China and the people of America", no definitive purpose ever did emerge. We had rather significant contact with our scientific colleagues in Peking, Shanghai and Canton. In the former two cities members of our delegation delivered lectures on their various interests in physics. These lectures were very well attended, and vigorous, informative question periods accompanied each of them. In general, however, our journey consisted of rather more formal visits to factories, people's communes, research institutes, universities, hospitals, primary schools, national monuments, museums, etc.

From a group of fourteen eager American visitors one can expect at a minimum fourteen elaborate accounts of a visit to a plase so different from America. I will try to give in this brief account of our journey some of the highlights of our trip as I experienced it. Because of the vast amount of material one is exposed to in a month's encounter with so gigantic an object as a country of 800,000,000 people, I have had to select from my notes and my record of my colleagues' reports only a few of the more interesting items. I will present some observations on (1) life and culture in China, (2) scientific activity in China, especially in physics, and (3) in a lighter vein, some of our experiences interacting with the Chinese people. I feel I ought to make it clear from the outset that I am not a China "expert". My command of the langauge is hardly notable: I speak perhaps twenty-five words in the

"absolutely necessary" category with an accent that only a generous teacher might agree resembles the Peking dialect now taught in China. My conversations were, therefore, either through or with the interpreters accompanying us. I am a very amateur student of Chinese history since the Opium Wars of the 1840's and listen happily to anyone who speaks with even minimal authority about Chinese art. I am at best a "new China hand" who has been quite impressed by my one visit to the new China and who has at once both an enormous enthusiasm and severe reservations about it.

Even the most casual student of China has read of the poverty, disease, hunger and pervasive deprivation that haunted the cities and countryside alike during the last years of the Ching dynasty and the 38 years of civil strife that followed its fall in 1911. This is certainly on one's mind as he visits the cities and countryside of the new China. The impression that comes across most strikingly is that the people are now well fed, well clothed and reasonably, if not elegantly, housed. Everyone except the severely handicapped and aged appears to be employed. Sometimes in labor intensive China we encountered what must be called underemployment, but never of such a severe nature as to seem unintelligent. Wages are, of course, regulated by the State. In a city a beginning worker may earn 30-40 yuan ($15-$20) each month while a "veteran worker" will earn up to 120 yuan per month. From this income one must pay 3-4 yuan/month for an

apartment of 3-5 rooms and approximately 15 yuan/month for each person for food. The diet consists of fish, chicken, pork, duck and occasionally beef, rabbit and delicacies in addition to vegetables and the staple grain foods: rice in the South and wheat in the North. This food is brought into cities from the people's communes each day, and sold in areas along the streets that appear to have been designated as neighborhood markets. The fact that we saw no refrigeration or freezing facilities in any of the homes or apartments we visited clearly implies that these marketplaces are frequently visited by housewives. A digression on "Women's Lib" in China: It is a modern Chinese saying that at Liberation in 1949 "Men were liberated once, but women were liberated twice." To a significant extent this is true. Women do seem to perform all tasks that employ men. We were told they receive the same salaries. They are, however, under-represented on the administrative bodies of China (called Revolutionary Committees) and in membership in the Chinese Communist Party. Further when we asked who does housework and tends the children, the answer was "The women, of course." From the point of view of several of us, it seemed that Chinese women would probably someday be liberated a third time.

On the two people's communes we visited, this general impression of the people's being well fed, clothed, and housed remained true. Peasants (synonymous in China with farmers) own their their houses on the communes. They appeared very clean and, in the heat of the Chinese

summer, were cool and comfortable. The peasants' income is received both in food according to the annual production of his commune and in the form of cash income. The amount one earns is based on a system of work points which are assigned by discussion among the members of a person's "production team." Private plots and the raising of domestic animals are permitted on the communes. These are used to supplement the income and diet of peasant families and can be quite non-trivial additions. One family we visited on a commune outside Peking sold three pigs last year at approximately 60 yuan apiece. Added to a peasant family cash income of perhaps 400 yuan/year , this is significant.

Eighty percent of China's people live on the 70,000 communes around the country. Thus, it seems worthwhile for me to take a few moments to describe in more detail the Double Bridge People's Commune about 10 km southeast of Peking. Our translator told us that this was a "poor" commune and that he was almost embarassed to bring "distinguished foreign friends" there. My reading indicates that it is a typical commune. This commune was organized during the Great Leap Forward in 1958 by combining 46 neighboring villages which had been working as members of smaller co-operatives since shortly after the land reform of 1951-52. Forty-thousand people live on the 90 square km of the commune. The administration of the commune is in the hands of concentric sets of revolutionary committees. At the center is a body of 40 members--only six of whom are women. The next division

is into six "production brigades", which more or less coincide with the co-operatives existing before 1958. After that the workers are members of production teams consisting of 500-1000 people. It is at the level of the production team that the detailed decisions about who works where and who receives how much reward for what work are made. The revolutionary committees at each level are in principle separate bodies from the local communist party organization. In fact, of course, there is a large representation of party members on the various revolutionary committees. Among other reasons, this is to be anticipated since the party chooses its membership from the most industrious and articulate part of the population. Precisely that kind of person could be expected to be elected to the revolutionary committees.

The members of one's production team are thoroughly involved in the life of each person. Before one is married he or she lives in sex segregated dormitories with fellow team members--after leaving school to work, of course. Each Chinese citizen is strongly "encouraged" to attend six hours a week of study sessions of "Marxism-Leninism-Mao Tse-Tung Thought"; these study groups are organized among members of a production team. { When we asked, in a Peking neighborhood, whether one could choose not to attend these "voluntary" study sessions, we were told it was possible but "the comrades will come to talk to you" to persuade you to join. As far as we could tell, everyone attended. } Marriage is very straightforward in China. A couple

must receive permission from his production unit, then they go down to a local police station and register; that's it! Clearly this further involves the production team in the life of any individual. Permission for a couple to marry, by the way, is not always forthcoming just for the asking. A young American-Chinese student studying for the summer at Fu Dan University in Shanghai told us that when he spent sometime on a local people's commune, he arrived in the midst of a big controversy over the refusal by his production team to allow a couple, each aged twenty-five, to marry. Controversy is perhaps inappropriate. The production unit had made its decision several weeks before and now the male comrades were talking to the young man and the female comrades, to the young woman to convince them of the validity of the "decision of the masses." There was no question that the decision might be reversed by discussion, only how long it would take the comrades to persuade the couple to accept it. The same couple probably would be allowed to marry, if they still want, in two or three years when they are more "mature." For reasons of population control, the average marriage age among women is encouraged to be 25-27 and among men 28-30. The decision of this production unit may thus seem harsh, but is probably not unique.

One's life in China, then, can be seen to be very much involved in the lives of one's fellow workers. Indeed, so much involved that privacy as we understand it appeared to be absent from Chinese life.

[The fact that in the Chinese language there is no really acceptable translation of our word, privacy seems consistent with this observation.] A society which is organized with such mass involvement and with the intense level of social pressure prevalent in China is also able to be organized by a central authority to achieve impressive social and economic tasks. In my observation the present government, while having made some well publicized mistakes such as the Great Leap Forward, has used this aspect of Chinese society to enormously benefit the vast majority of the population. The people's communes are a prime example of the rapid and efficient rationalization of an important sector of the economy by central authority.

In such a situation it is natural to ask whether the people are happy. Well, to be frank, how could any visitor ever really find out? In my opinion the questions of personal privacy and volition are at this time almost secondary in a society like China which has only barely emerged from the degradation that large segments of its population can vividly remember into a viable thriving country which provides every citizen with food, clothing, medical care, housing, and employment. Probably the people are happy. The fact that I (and likely the reader) find the social pressure and "persuasion" by the comrades unacceptable must be quite irrelevant. Needless to say, it would be rash for me to conjecture how long the Chinese people are likely to remain "happy" on these standards.

Aside from being rather well organized, it was my feeling that life in China tended to be rather drab, certainly compared to what we have come to expect in our own lives. Recall that young men and women are married only in their middle to late twenties. Before that, contact between the sexes is restricted to on the job or in the classroom activity. When a couple begin to date, they are engaged to be married. We asked our student friend in Shanghai what his dorm mates did to entertain themselves. He replied that they mostly play cards. Other forms of entertainment consist of going to the opera to see one of the modern Peking style revolutionary operas. Typical of this genre of "proletarian culture" is The White Haired Girl, a straightforward story about a girl whose father is killed by a landlord and who runs away to the hills to escape him. Her boyfriend joins the Red Army, eventually comes back, kills the landlord and discovers his girlfriend, her hair turned white from her experiences surviving in the mountains, wandering about the village. The accompanying music is hardly what one would call great, but is simple, sturdy revolutionary support for the story line. It is not necessary to go to an opera house to experience these operas since films of them are enjoying very long runs in the neighborhood cinema theatres. Of course, one can go to the song and dance routines of the People's Liberation Army (PLA) or to the acrobatic shows for some variety. Radios were present in many places, but I have no real idea of what the fare is. I saw only one television set; it was in a lounge

of our hotel in Peking. The evening we turned it on it was featuring the PLA dance show we knew to be playing in town.

These various shows-opera, acrobats, etc. - are very popular. We tried to get tickets to several performances in Shanghai and Peking quite without success as they were sold out. Their popularity attests both to the absence of essentially any other form of public entertainment and to the fact that there is a real need for this manner of activity. The acrobatic and operatic troupes from the larger cities do travel around to the villages bringing simple culture as well as revolutionary fervor and propaganda to the masses of the people.

The dress of the people is also rather drab. There seems to be very little room for any personal expression in this form. In the summer men wear cotton trousers--blue, gray or khaki--with a white shirt which hangs out and plastic sandals. Women, for the most part, look precisely the same, except perhaps a colorful blouse will be worn. This custon resulted in a somewhat curious incident for me. I came to China from Los Angeles with a selection of clothes which at best would be regarded as conservative, if not downright reactionary, in that city. Among them I had a red and white checked shirt. As I sat down in one of our physics lectures wearing this, old vice-president Wu, whom I had gotten acquainted with at the Fourth of July party, came over and told me: "Young physicist! In our country your shirt is ladies' wear!" Now Wu is an extremely venerable old gentleman of about 80 or so. Indeed

he is so venerated that whereas most old gentlemen are called Lao (old) with their name following, he is one of only three or four people in China who are distinguished by having Lao follow his name. When Wu Lao announced to me I was wearing ladies' clothing, I felt uncomfortable until I could get back to the hotel and change into something even more drab. It actually took me another week or so until I realized fully that it was not because of my "ladies' wear" that the Chinese were staring so thoroughly at me on the streets and in the shops, but it was simply that I was a wei guo ren (foreigner). The shirt was only a small perturbation on a giant effect.

Because we were so obviously wei guo ren and could not speak Chinese, approaching even the not insignificant number of Chinese, especially younger ones, who spoke some English was rather difficult. Of course, some rather formal contact could be established through our excellent interpreters, but it was most unsatisfying. Two very clever members of our delegation had thought to bring along a dozen Frisbees between them, and playing Frisbee in the squares and parks of cities and on the people's communes proved to be a most remarkable ice breaking device. Our first game of Frisbee was played in Tien An Men Square (the "Red Square" of China) in Peking on a warm summer evening. Within five minutes a crowd of, at minimum, five hundred had gathered to watch these weird wei guo ren fling about a UFO. After ten minutes at least a thousand people had gathered so tightly that what is normally a

one-dimensional game with at least a line of sight to other players had become a zero-dimensional game. Tossing a Frisbee in the general direction of a spot radiating English can be fun but is not conducive to accurate throwing. By this time, however, one is really "mingling with the broad masses" and exercising our fluent Mandarin we would smile and say to the closest people: Ni how! Women shr mei guo ren! (Hello! We are Americans). Often, as repetitions of the words mei guo ren would go floating through the crowds, someone would yell, "Hello," or perhaps "Good-bye" and contact of a friendly, abeit not deep, sort would have been established. At this point we would begin handing the Frisbee to various members of the crowd and coaxing them to toss it to us. The roar of laughter and delight that followed a lousy Chinese toss was understandable in any language.

I think the height of Frisbee Diplomacy occurred on our last morning in Shanghai. Four or five of us asked to go to a local park to "mingle with the masses" and, of course, to play Frisbee. Our hosts wishing, as usual, to show us the most beautiful park, not the most crowded, drove us off to the outskirts of the city where we were given free run of a magnificent, rather empty, park. We announced that this slightly missed our mark and after soothing ruffled feathers, were driven back into town to the People's Park. On the return trip a passing train stopped our cars and left the other side of the road completely free--for Frisbee playing naturally. Out we popped and for fifteen minutes

minutes tossed the Frisbee both among ourselves and to people standing in trucks also waiting for the train. The real coup was a truckload of 30 or 40 PLA men. As a rule, PLA personnel did not mingle much with wei guo ren. In fact, our first Frisbee game in Peking had been broken up by a nervous PLA man who was guarding the gate in front of which the game was proceeding. But on this occasion, they were completely captive. One Frisbee tossed into the truck and all formal decorum vanished.identically as they vied for an opportunity to throw it back. After the train passed, we returned to our cars to the cheering of truck loads full of new Frisbee lovers, PLA men included.

At the People's Park our success was magnified. After the game took its usual zero-dimensional turn, I called several times, "Hey, Joe!" to Joe Goldberger who had disappeared in a sea of Chinese. At that juncture an oldish man came up and insisted Ilet him throw the Frisbee; he was the only Chinese person who was so bold. I suppose he thought yelling, "Hey, Joe!" was part of the symbolic ritual in which we were engaged, for no sooner did he have the Frisbee in hand, then he yelled, "Hey, Joe!" and tossed it perfectly to Joe's outstretched hands. Lao Kahn also spoke English perfectly. At the end of the game we presented him the Frisbee, as was our custom when we found a good player. He insisted we return the next day so he could give us a gift, but alas, we were leaving that afternoon. When Shanghai-built Lao Kahn Frisbees flood Western markets, you will now know where it all began.

Beyond these amusing interactions our primary social intercourse was at the banquet table. We were entertained at a magnificent banquet by the Revolutionary Committee of every city and village we visited. This would be an occasion of gourmet delight as well as a tedium of toasts and counter-toasts of welcome and declarations of "mutual friendship between the peoples of America and China." At the rate of a banquet every other day the ritual rapidly became very wearing. Several of our party developed "small banquet fever" which disabled them just before a not so important banquet--recovery from these illnesses was generally quite rapid.

In good spirits about the whole formal banquet scene we gave a banquet for our interpreters, Chang Chi and Li Ming-teh, in Shanghai at the end of our stay. Our guests were led through the reception line, composed of our group, by our translator's "translator" who rapidly repeated in seemingly random order the Chinese words for hello, thank you, very good, and you're welcome. At the banquet table we gave toasts in English and they in Chinese. Both were translated by our friend the student who had been Shanghaied -- so to speak -- into the task. The coup de grace of the occasion was a dessert of baked Alaska which Li Ming-teh had come to know when he accompanied a group of Chinese scientists to America in the winter of 1972.

Our most serious task in China was establishing contact with our scientific colleagues. We visited a variety of scientific and educational

institutions in Peking, Shanghai, Canton and Dalien. These included the Peking Physics Institute of the Chinese Academy of Sciences, the Academy's Chemical Physics Institute in Dalien, Fu Dan University in Shanghai and others. On each visit we would, after the traditional "brief account" of the institution given during the consumption of enormous volumes of tea, tour laboratories and workshops. A free exchange of questions and answers characterized the discussion at each institute. The Chinese were clearly as anxious to communicate to us what they could do, had done, were doing and planned to do as we were to find out. Our suggestions and criticisms were requested in each laboratory and occasionally our advice on future programs was solicited.

A detailed account of our scientific visits will soon be available in our report to the Committee on Scholarly Communication with the People's Republic of China of the National Academy of Sciences. I suggest that the reader contact one of the members of our delegation or that Committee, if he is interested in a copy. I will confine myself here to a few general observations on science in China.

What is most clear is that fundamental science research in China appears to have been at more or less a standstill from the beginning of the Cultural Revolution in May 1966 until about a year ago. This has the consequence that at best one could expect Chinese experimental science to be quite underdeveloped relative to the U.S. or Western Europe. Indeed my impression of the physics laboratories we visited is one of vigor,

enthusiasism, high quality personnel, but rather unsophisticated equipment and very little in the way of concrete results. For example, we saw two cyclotrons: one at the Institute of Atomic Energy outside Peking built by the Soviets and producing 24 MeV alpha particles and the other at the Institute of the Nucleus near Shanghai completed by the Chinese in 1964 and modeled closely on the Soviet-built machine. The first of these seemed not to be in use at the present. The experimental areas were in a word, empty. The Shanghai machine has been employed for a variety of experiments continuing through the Cultural Revolution, in particular some low energy (n, γ) work. Since publication of journals was suspended from 1966-72, none of the research that was done has been published, although we were told about, but not shown, internal documents which circulate to keep one's Chinese colleagues informed.

The major scientific work in Chinese physics (aside from, one must suppose, weapons research) seems to have been applied research and development of useful things. We saw an impressive variety of particle detectors designed and built at the Peking Institute for Atomic Energy. We visited several workshops where oscilloscopes were being constructed or integrated circuitry being put together or crystals being grown and doped for use in transistors. The emphasis is on "integrating theory with practice" and "serving the people", if I may use the Chinese' own apt slogans.

It was my impression that many of the Chinese scientists we

encountered felt that soon they would be encouraged to take up less product or mission oriented research and that fundamental science would blossom again in China. Usually this expression of possible future developments would come in response to our queries about how China would be able to maintain any excellence in science without the stimulation of basic research.

Our Chinese colleagues in high energy physics seemed very bright and extremely well informed. They receive in Peking, Canton and Shanghai all the important and respectable journals from the U.S. and Western Europe. Also they seem to read them quite avidly. In questions asked during and after our several lectures it became clear that many members of the audience had thorough and deep knowledge of the subjects covered in our lectures. They, of course, do not have access to the "private communication" level of research that (at least in physics) plays a healthy role in the stimulation of ongoing work. But that understood, the Chinese physicists seemed every bit as well trained and as able as our colleagues in the West. Clearly one may expect China to develop into a major source of productive and valuable ideas in all fields of science once the decision is reached and carried out to spend their still limited resources in this manner.

I am personally very enthusiastic about the possibility of extensive scientific collaboration and exchange with our Chinese counterparts developing during the next decade and continuing on in the indefinite

future. We may, very temporarily, find ourselves in the role of educator as Chinese science regains its own strength, but I expect that this will be a brief interlude to full blown intermingling of the scientific communities. I feel that the model which one may look to in order to guess how Chinese-American scientific contact may develop is that of the U.S.-Western European experience, not the U.S.-Soviet example. It is very inaccurate to extrapolate from the fact that Marx and Lenin are ideological heroes in the U.S.S.R. and China to any possible simularities about their cultural and scientific attitudes. The disparities are enormous, and I sense a real, viable future in American-Chinese scientific relations that will be achieved at a much more reluctant pace in U.S.-Soviet agreements. As Professor Tsien San-Tsang, the director of the Peking Institute for Atomic Energy, expressed it to us: "I feel that your visit is like the first neutron in a chain reaction." I am confident that he is correct, and that he had controlled fission in mind.