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MEDICAL PROGRESS IN NORTH SHENSI
A report by Dr. Richard Frey

(The following report should be of great interest to the American Medical profession. It not only shows the conditions under which isolated doctors in North China have to work but it describes several medical practices which were born out of a lack of Western drugs. Old Chinese practices and medicines have been revived and in many cases have been found to work. Dr. Frey is a Vienna-trained physician who worked in Peiping for a number of years. Over six-feet tall, he must be a striking figure as he walks among the peasants in North China, listening to their tales of woe and doing his best to cure their ills. At the present time he is in Yenan carrying on research with penicillin and translating into Chinese articles in current medical journals.)

Before finally leaving occupied territory I had paid two visits to the Border Region. In the summer of 1940 I paid a short visit to East Hopei and helped to treat some wounded. In the summer of 1941 I wished to go to work in the liberated area but couldn't proceed as a Japanese offensive was in progress. I finally left the occupied area in December, 1941. I bicycled out of Peiping to an arranged meeting place. Owing to a misunderstanding regarding Peiping and Tokyo time the agents were not there, and so I had to wait resulting in trouble with two Japanese from whom I was able to escape on my bicycle though they fired after me. After finally meeting the agents we bicycled for about two hours against a violent storm and then in the hills met a group of the regular army who were the first I had seen. They had just captured a machine gun with the expenditure of only six hand grenades. They were expecting me and when I arrived they sent a radio message back to headquarters to arrange for an escort. We rested till the next evening though I could not sleep as the k'ang was too hot. As the enemy usually attacks in the early morning hours, all food has to be prepared at night. The connection of the small fireplace with the brick bed saves fuel since at the time of cooking the brick bed as well as the room is heated. Having never slept on a k'ang the first night was quite an ordeal. (Chinese bedbugs do not seem to enjoy Chinese blood very much one of the boys said. Probably I was the only one who was bothered about being bitten!) We first skirted round Miao Feng Shan, a mountain 60 li off Peiping. In 1941 no troops were stationed there permanently. Now the army has a regular outpost near the top of this mountain range in sight of Peiping. Then we went for three days through a depopulated area where I did not see any civilians. After crossing the Yung Ting River we had still to cross a blockade line where we had a fight after which I did some first aid and tried to reduce a fracture. The next day I found that the patient had left and was told that he had gone off to another battle. Not understanding the conditions and the spirit of the 8th Route Army soldiers I became angry with them. Since then I've often met with similar cases where officers before fulfilling their duty prefer to go with their soldiers into battle than to be left behind or sent to a hospital. About three weeks after I had left Peiping I arrived at P'inghsi headquarters.

I stayed at the P'inghsi headquarters for a week or two and then went on to Chin-Cha-Chi headquarters. Here General Nieh asked me to teach at Bethune Medical School and so after about a week at headquarters I went back there. At that time the school was at Ko Kung, a big village about 25 miles from the front where I stayed altogether for about three years. When I arrived the total of teachers, nurses, workers and students approximated a thousand. In the same village was the main International Peace Hospital. After staying there for about two weeks to get acquainted with the situation I was asked to start teaching the advanced class.

The background of the class was below that of the average western student. The average was only middle school standard, but since they had had three years of study and practical work before the advanced class started it was possible to do advanced work with them. Teaching was very difficult at first as my Chinese at that time was not good. I had to write everything out and have translated all the words I did not know. As a result it took about eight hours to prepare one hour's lecture and I had six lectures per week. Because the school had never been able to get any new books, they knew little of recent developments, nothing about sulfa drugs and little about atabrine, etc. To begin my course, therefore, I concentrated on recent developments in medicine.

At that time the ordinary course for army doctors and surgeons lasted two years with an additional six months of practical work. The average background of the students was lower middle school or primary school. There were also courses for pharmacists and dispensers and one-year courses for nurses whose primary school background was even lower than that of the medical students. The poor preparation of the students is due to the fact that many of those from the occupied areas who were better educated went to areas near Chungking rather than to the liberated areas. And it must also be remembered that a great many of the intellectuals at the front have been occupied with other important work. It was necessary therefore to give special pre-medical training. There were classes in anatomy, physiology, histology, pathology, bacteriology, clinical diagnosis, and pharmacology and also a few courses in chemistry, physics and mathematics. On the average each subject was taught from 50 to 150 hours. Regular medical and surgical training carried courses on eye, ear, nose and throat diseases, on skin and venereal diseases, and there were a few on obstetrics and gynecology. Only the advanced class had any pediatrics.

In peaceful times the school had a more or less collective life. The students were divided into groups with elected student bodies. The life of the students was hard. They had to work extremely hard and be attentive because of the low academic background they started with. Great stress was laid on discussions which took place every evening. Teachers took part in the discussions to get a good idea of students' progress.

The average day was divided as follows: Arising before dawn, with ten minutes for dressing, an hour's exercise (mostly military drill), one and a half hours study, a one-hour class, half-hour for rest (mostly production), two hours in study for pre-medical students and work in the hospital under the supervision of teachers for other students, half-hour for supper, two and a half hours in recreation (mostly spent in the fields), one hour for study, one hour for discussion and reports, roll call, and then bed.

Life was especially hard in winter because of the lack of fuel. It was often necessary for students to keep heating their fountain pens during writing to prevent the ink from freezing.

Each student is given lecture notes mimeographed by the school and one sheet of paper per month. The small amount of paper given is due to the limited budget but many students find ways on their own to get more. Even Saturday afternoons and Sundays which are supposed to be free are usually spent in reading the paper or in study.

The original production plan for the school provided that it should produce its own food for $1\frac{1}{2}$ months per year. Later it was found that this much production made the students very tired and at the end of 1943 the production program was somewhat reduced.

The school is coeducational. Compared with other schools the students are more serious and hard-working and have very little time for play and amusement.

The teachers' daily quota of work is about the same as that of the students but the former have more time for study and reading. Evenings are spent mostly in preparing lectures which have to be done very thoroughly since students ask all sorts of questions. Most of this preparation has to be done by the light of a vegetable oil lamp of less than one candle-power.

There are a few holidays when there are festivals with plays and sport meets. but the number of holidays is very small. This is because of the difficulty of finishing the teaching program which all expect to be interrupted at least once a year by a Japanese "mopping-up" offensive. If the offensive is not on too large a scale however, teaching can be continued to some extent and classes have sometimes been held within sound of rifle and machine gun fire.

The work of the school is made difficult by its very limited budget which means a shortage of simple materials like paper and ink for both students and teachers and also a shortage of books. The latest book is a 1940 "Review of Medicine". Most of the books were published in 1935 or 1936. Because there were no modern medical journals, I have been translating while in Yen-an some articles from recent American journals and sending them out. Though the school has a fair number of elementary books they are irreplaceable and thus have to be kept hidden away most of the time. They are taken out only when specially needed because of the difficulty in hiding books securely if there is a sudden Japanese attack.

New students come to the school with absolutely no knowledge of medicine but after two or three years they have a fairly good idea of all the important subjects. Teaching is concentrated on what will have practical value. Diseases not found in North China are not taught. Those found are taught very thoroughly. A great deal of time is spent on malaria, typhoid, relapsing fever, and war surgery.

After graduating from school, students are sent to the front or to one of the sub-district hospitals where they work another six months under the supervision of qualified doctors.

Medical work is very much limited on account of a shortage of instruments and medicines. Even simple things like stethoscopes and thermometers are so scarce that some doctors have trained themselves to work without a stethoscope. Every two months each doctor gets a copy of a journal put out by the medical advisory committee of the Border Region. This journal is mimeographed and contains articles on current subjects and methods of overcoming difficulties. It is mostly written by the teachers at the school.

When I first arrived at the school Dr. Drakanath Kotnis was still superintendent. Under his supervision a number of more or less well-trained surgeons were graduated. His attitude towards work and his friendship and understanding for his Chinese friends as well as his hatred of the Japanese made an unforgettable impression on all those who met him. Unfortunately he died in December, 1942, from an attack of epilepsy and left his wife, (a former PUMC nurse) and a small baby. His death was a great loss, not only to the school, but to the entire Eighth Route Army. He did magnificent work and saved many lives.

The staff members of the school are all educated doctors or surgeons and most of them take part in the practical work of the hospital. Although the International Peace Hospital is the best equipped and staffed of the entire region, its equipment is worse than anyone would suspect. The instruments brought by Dr. Bethune in 1938, still in use, are practically the only ones available. Medicine is for the most part locally manufactured.

The IPH does not look like a hospital but like ordinary village houses. There are five sets of wards: medical, surgical, infectious diseases, obstetric, and eye. The patients lie on k'angs. There is a laboratory with three microscopes (shared with the school) but equipment is very scarce. For example there is a shortage of dyes, and, recently, it has become virtually impossible to get new supplies from occupied territory. There are also an operating room, a dental office, and an OPD. The outpatient department which gives both treatment and medicine free handles about 100 patients per day. There is an X-ray but no generator, and it can thus be used only at the nearest arsenal. Even then, operation with an interrupter from a direct current dynamo is not very reliable.

Most of the medical patients have malaria, relapsing fever, gastroenteritis or intestinal disturbances while the surgical department handles all kinds of wounds. The kinds and numbers of operations is limited by the instruments available. Cotton, gauze, and even catgut are all made locally.

Every year I went to the front for two or three months on a tour of inspection and so obtained an opportunity to see the conditions under which Bethune medical school students have to work after graduation. It really takes a good doctor to work under the conditions at the front with no laboratory, no X-ray, and usually not even a stethoscope or thermometers. In spite of all these difficulties they usually manage to make correct diagnoses.

The doctors at the front are all very eager to study and learn and during each trip I spent a considerable time teaching and lecturing.

Besides a shortage of instruments and apparatus there is also very little medicine. For example most of the people have malaria every year. With a total population of 19,000,000, there are only 30 to 50 lbs. of quinine available.

During the past two years we have been experimenting with other methods of malaria treatment and have come to the conclusion that quinine, even in sufficient amounts, is not an adequate treatment for chronic malaria. On the other hand, we have found that old Chinese methods, used for centuries, have some effect and so we have made considerable use of acupuncture. We use an ordinary needle, disinfect the skin and prick it in selected places. We have been able to prevent most attacks and have saved hundreds of pounds of quinine. Both civilians and soldiers have been taught these methods and quite a number of peasants are now able to give treatment to their neighbors in the absence of doctors.

Acupuncture is done two or three hours before the attack. Pricks about 2 mm. deep are made between the seventh cervical vertebra and the first dorsal and between the 6th and 7th dorsal vertebrae. After pricking the skin the place is massaged and one or two drops of blood squeezed out. Checking this method by microscopic examination we found that, after acupuncture the parasites disappear from the blood or definitely decrease in number in about 70% of the patients. At the same time there was also a certain increase in white blood cells. This is the outline of one method but there are other Chinese methods which have had some effect.

The results of this nervous irritation method stimulated me to make further investigation of similar treatments and during my stay at the school I worked on the problem for two years. The work, based on the theories suggested in Speransky's "A Basis for the Theory of Medicine", often had astonishing results and hard to explain by ordinary theories. For example, I treated some cases of gastric ulcer by an injection of novocaine as sympathetic lumbar block. Patients who had been vomiting blood for a number of years were cured by this treatment and up to the time I left the school, about two years after the treatment, there had been no relapses. By injecting novocaine into the tissue surrounding the kidney we treated three cases of Reynaud's disease, which cleared up entirely. The gangrene stopped spreading and all three cases recovered losing only some minor functional ability. Two cases of allergic dermatitis have also been treated effectively by this method.

Another method is spinal pumping. Spinal fluid is drawn out and pumped in ten to twenty times and finally 10 to 12 cc. withdrawn. This method has been effectively used in two cases of epilepsy where it not only prevented the onset of the fit but also brought about an amelioration of the attacks. Attacks which used to last one or two hours after treatment lasted only five to ten minutes. Surgical diseases like ulcers of the leg and affection of the lower abdomen have been treated by the lumbar block method with some success. This treatment was also effective in cases of neuralgia. Because of conditions at the front, research work cannot be well systematized. With offensives once or twice a year you do not often see patients again. Though there were some failures, this kind of irritation treatment seems to have a definite future

and I hope to be able to do some more work on it at Yenan.

The lack of supplies has been overcome to some extent by our own drug factories in Chin-Cha-Chi which have been able to produce limited amounts of such drugs as bicarbonate of soda, sodium sulphate, magnesium sulphate, etc., as well as various Chinese herb medicines. We have not been able to produce any sulfa drugs and they cannot be obtained at all.

At the front many wounds become infected because of a lack of even simple drugs like iodine and mercurochrome. The most seriously wounded get septicemia which is treated with intravenous rivanol, mercurochrome, or dye preparations. We are certainly losing many men from a lack of sulfa drugs. Operations are difficult at the front because of a lack of haemostats. A regiment usually has only three or four and these are often old and rusty. We have not been able to make them locally. Amputations have to be performed sometimes with a carpenter's saw and an ordinary knife. Sterilization is not very effective because we can use only the type of steamer employed for making Chinese bread. Locally made instruments comprise scissors, knives and dissection forceps. Because we have no X-ray equipment many fracture cases cannot regain the use of their limbs and thus the proportion of cripples is high. The only methods for treating fractures are Thomas splints, plaster of Paris, and, more recently, skeletal traction.

At the front I took part in several engagements and had an opportunity to check the work of field units. When attacking enemy forts it is usually possible to find a sheltered spot two or three miles from the fighting to which the wounded can be brought for treatment. Local peasants carry back both the wounded and the dead from the front. As there are no roads, stretchers are the only method of transport except for the lightly wounded who can sometimes ride. In the engagements in which I took part most of the wounds were the results of hand grenade or bayonet wounds as there was hand-to-hand fighting. Because of a lack of cartridges the army prefers close range fighting. All these wounds were badly infected and, since there were no sulfa drugs, convalescence was protracted. On a very few occasions I was able to give blood transfusions but only because I carried a microscope with me. There was no plasma and the only way of treating shock was by saline injection. There was not enough glucose and even the salt was locally made.

It was usually possible to give treatment within one to six hours but, the lack of instruments made it almost impossible to save abdominal cases. Surgery was mostly debridement, extraction of foreign bodies, and amputations. We have been trying to find ways of saving abdominal cases but there are not enough haemostats, no microscopes and no quick ways of getting patients out of shock. Doctors and first aid men at the front not only have to do medical work but also often have to join in the fighting. A considerable number have been killed. There have been several instances when doctors have stayed with the wounded trying to save them from the enemy and finally have committed suicide to save themselves from capture. Most people prefer suicide to capture because of the bad treatment of prisoners.

At the front I treated a number of poison gas casualties. One time the enemy used some kind of corrosive gas but I saw the wounded soon enough to

prevent ulceration of the skin and the lung lesions therefore healed up pretty fast. Since our troops have practically no protection against gas the enemy of course uses it. All that can be provided is a face gauze with charcoal and lime in it, but this is not very effective.

During 1943 we had a big enemy "mopping-up" campaign. We had to break up the school and hospital entirely. The patients were hidden in caves in the mountains and the students were distributed among the local population. I myself was moving with a non-fighting unit composed of teachers and medical workers. The Japanese were attacking the entire Pei Yueh region in the longest and cruelest campaign ever experienced in Chin-Cha-Chi. The local population suffered especially. Not only were houses burned and animals and food carried off or destroyed but many women were raped, and every kind of atrocity was inflicted on the population. Babies were thrown into boiling water and enemy doctors vivisected pregnant women. There were definite proofs of cannibalism - eating hearts and livers. (I personally interviewed several peasants and soldiers who had escaped.)

During this mopping-up campaign, conditions were difficult for a non-fighting unit but we had only one or two casualties. The entire hospital moved into the mountains. The patients were divided into small groups with a doctor and a few nurses in charge of each. The patients were mostly hidden in caves and provided with some rifles and hand grenades. The doctors and nurses had to give the patients ordinary treatment and defend them. The caves were mostly on steep mountain sides where the enemy did not often dare attack them. In some cases the enemy used gas against them (smoke gas) but without success. One doctor was awarded the title of hero for his magnificent work. By day he treated his patients, helped nurses prepare food and he carried it to the caves. At night he kept watch on the mountain peak or stayed by the telephone to get news of the enemy. Several times when he got news he managed to notify all the patients and nurses though the caves were miles apart involving continuous mountain climbing. In one case the Japanese discovered a cave with two wounded patients and a nurse. They sent a puppet to demand surrender but the nurse said, "We have a rifle with five rounds of ammunition and hand grenades. If you try to get in we will use them." The Japs forced puppets to attack but none escaped alive. Finally in the evening the enemy went away.

During this mopping-up campaign the hospital service was naturally more or less limited to changing dressings and giving medicines. Each hospital had an operating unit so that urgent cases could be operated on.

The unit I was with always managed to avoid the enemy though we were one of their special objectives but we were bombed once or twice. Once in the Shen Hsien mountains we were surrounded by ten thousand enemy troops. We managed to get out at night passing within 50 meters of the enemy at one place. It is necessary to remain calm and be prepared to move at any minute, day or night, also to keep scouts on the alert and to be in touch by radio or telephone with the fighting troops who have information on enemy movements. During this campaign students were distributed among the local population. They were given some medicine with which they could treat the people who in turn were responsible for their safety. All the members of the schools and the hospital stayed within a radius of 50 miles and we could therefore get together again quite

quickly when the campaign was victoriously ended. Even during the campaign we managed to keep contact with groups of students and to continue some discussions with an occasional lecture. In previous "mopping-ups" the school had travelled together as a unit and teaching had been continued, but this time conditions were too difficult.

In the autumn of 1944, after nearly three years of work, I left Chin-Cha-Chi for Yen-an. Through mountains, over blockade lines, highways and railroads it took one month to make a 700-mile journey.

Conversations with the leaders of the 8th Route Army and in the cave city of Yen-an have made a deep impression on me. Although life in Yen-an is different from life at the front I find it very interesting. Still I hope to be back at the front soon. In the meantime I am lecturing at the medical school here and brushing up my rusty medical knowledge by reading new American journals. These are personal gifts of American doctors and other friends such as those of the China Defense League and China Aid Council who have been here on visits and taken an interest in our work.

At present I am spending most of my time in culturing penicillin.