BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 23 1949

WOMEN WAR CAPTIVES IN RUSSIA

BY

R. F. A. DEAN, M.R.C.S., L.R.C.P.

(From the Medical Research Council Unit, Wuppertal, B.A.O.R., and Department of Experimental Medicine, Cambridge University)

In August, 1948, 24 women who had recently been released from camps in Russia were admitted to one of the hospitals in the British zone of Germany which received returning prisoners of war in need of medical care. They were, on the whole, in very good clinical condition, and this seemed remarkable when considered in relation to the known or generally believed stories of hardships of life in Russia. It was therefore decided to obtain from some of the women careful and detailed accounts of their experiences.

In order that the accounts might be comparable and more easily managed, a questionnaire was drawn up and was followed as closely as the women's talent for diversion allowed. The account now presented was put together from the replies received. So far as possible it is an exact record of the replies, and comment has been excluded.

Six women, whose ages ranged from 21 to 37, were chosen for the questioning. They were all women who had come to the British zone as *Ost-Flüchtlinge*—that is, they no longer had any homes in any of the four German zones. They were questioned in complete privacy by a woman doctor who spoke German and English fluently, and they gave the accounts of their lives in Russia with perfect willingness and, so far as could be judged, without exaggeration of their hardships or pleasures. They appeared to be excellent witnesses, and their statements, made without hesitation and quite spontaneously, bore the ring of truth. The frequency with which they corroborated each other's stories was extraordinary. Two of the women (Margret and Ida) were, in fact, discovered to have been inmates of the same camp by the exactness of their descriptions of camp conditions.

The Women, and How They were Taken into Captivity

The six women were Ida and Elli, both aged 21; Hanna, aged 24; Margret, aged 26; Agnes, aged 32; and Emma, aged 37. All six came from the eastern portion of Germany, which is now partly Russian, partly Polish. Hanna came from the south (Silesia) and all the others from the north (Pomerania; East and West Prussia). They had all lived in country districts, and all except Hanna, who worked in an office, were doing housework and farm-work in their own homes. The two eldest women were married. Agnes had a daughter aged 12, but Emma had no children. Agnes's husband had to join up in 1942, and she then went home to her mother; Emma's husband, who was also a soldier, was reported missing in October, 1944.

The villages in which the women were living were occupied by Russian troops in February and March, 1945; and shortly after the occupation Elli, Hanna, and

Margret were visited by soldiers, who told them to go away with them immediately for three days' work. Elli, who had been expecting a summons of this kind, was wearing extra clothing and was told to take a blanket with her. Hanna was caught when on a visit to the neighbouring town. There she was questioned extensively, then taken to her home and told to dress in her warmest clothes. Margret had a rucksack, in which she packed some warm garments. Ida was taken from her home and told she must work for four months, and she also was allowed to pack a bag with some clothing. Agnes would have been taken from her home in the same way, but the Russians who came for her were apparently unnerved by the screams of the children who saw her going. Next day, however, while she was at some compulsory work of clearing away rubble, she was arrested with the women who were working with her and given no chance to go home. Emma hid in her mother's home for fourteen days after the Russians came, and then went with other women to the Russian commandant to ask for work, which they hoped might provide them with some sort of protection. They were set to mind horses. After a fortnight of this Emma was taken to the next village to clear away rubble. She could send no word home, and did not, in fact, see her home again.

It appears that to some extent age determined the choice of prisoner. Thus Elli and her sister aged 15, and four girls of similar ages, were taken together; Margret's father (49), her sister (20), and her brother (18) were taken with Margret herself, but her two sisters (13 and 7) and her mother were left. There was at this stage no examination to determine fitness for work. All the six women knew of cases of women who were pregnant when they were taken off. One gave birth on the journey to Russia, and she and her child died. Many others whose children were born later were repatriated after a short time.

Conditions on the Journey

It was usual for the women to be collected in cellars or other safe places. When the numbers were sufficient they were either marched or taken by lorry to a railway centre; a period of from seven to 14 days was usually occupied in these preliminaries, and all the six women said that it was physically the most exhausting of their experiences and the most severe mental strain. There was a widespread fear at this time, which seems to have been to some extent justified, that they were in constant danger of rape. There was no actual corporal punishment on the march, but the guards were very strict, urging the prisoners on with their rifle butts. Some of the women had to cover

long distances. For instance, Elli had a very hard journey. Her party was forced to walk for the first two days, and many of the women broke down and were left by the wayside, and Elli does not know their fate. The night of the second day was passed at a farm, where they were offered good food but were too exhausted to eat it. The next day the party were lodged with about 2,000 other women in a bank building, where they were kept for two days. On the third day they set out on a journey in which they walked 100 km. in three days. Many fell out, and the officer in charge said: "If you cannot get along, stay here and go 'kaput.'"

At the railway centres it seems to have been usual to provide washing facilities, and something was done to eliminate lice. For the actual railway journey into Russia the women were packed into cattle-trucks, about 80 in one truck. Sleep was very difficult, and if one woman wanted to lie down, other women had to stand. For toilet purposes there was a hole in the floor of the truck. Washing was impossible, and the food was very inadequate; a little bread was distributed three times a day, and each woman had one spoonful of sugar a day. All six women agreed that the lack of water was, however, the worst of their deprivations, and Elli and Emma said that their parties were actually screaming for it. One girl aged 18 in Elli's truck died after having diarrhoea. Elli thought that about 40 to 50 of the 2,000 women in her transport died on the journey. The train journeys lasted from two to four weeks; Ida and Hanna had the shortest journeys, and Elli the longest.

One woman, Hanna, ended her journey in the Caucasus, and the other women went to the Urals. The women all remained in these districts, but they were moved from camp to camp several times until they finally settled in camps where they stayed for periods lasting up to two years. In the Urals the variations of temperature between summer and winter were extreme, with cold in winter down to minus 50° C.; but in the Caucasus the climate was more temperate. The camp conditions in the first few months were obviously very bad. The camps usually consisted of collections of wooden huts, which were in a filthy condition and overcrowded. Many deaths occurred in these first months; Elli said that 18 of the prisoners with her died in one day, and she and the other women believe that the total number of women prisoners was almost halved by death by the end of 1945. The chief causes of death were typhoid and similar gastro-intestinal illnesses, and "water," which was apparently a generic term for swellings of feet, hands, and face.

The Work and How it was Done

The first medical examination was made by Russian doctors, or by German doctors under Russian supervision, within three to four weeks of arrival. The women were classified according to their capacity to work, but the examination consisted merely of an inspection. There was no thorough investigation. They were put in four groups: Group I were the fittest, and Groups II and III were less fit but still capable of work, whereas those in the fourth group, called "O.K." (*ohne Kraft*), were unfit for anything except cleaning and other chores in the camp. Margret and Emma were classified at this preliminary examination as "O.K." and the others as Group II.

Margret and Emma had no set work for the first six months. Agnes was put to work in a lime-kiln, and her job was to fill trucks with the lime. She said it was very hard work and the lime made her eyes smart; other women had lime burns. Ida, and Margaret as soon as she was well enough to be put in Group III, worked in a peat-

field, carrying the turves, stacking them, and loading them into trucks. The actual cutting of the peat was usually done by men or by the fittest women. Elli worked in a coal mine 275 metres below the surface. There she had to drag pit-props a distance of about 700 metres. The mine tunnels were only about 1.5 metres high, so that she had to walk in a bent position. For a short time she had to shovel coal. Hanna was not so specific in her account of her work. She was in a labour camp where the women were called on to do all kinds of work, such as helping to build roads and houses, and for a short time she worked in a silver mine. In July, 1945, Emma was put to work in a tile factory. For the first month she had to lay down boards for the tiles to dry on, but for the next six months she had to clear dust from the chambers in which the tiles were baked. These chambers were very hot and dusty. Afterwards she went back to carrying the boards.

All the women stated that a specific amount of work known as the "norm" had to be done each day. Each group had a different "norm," which was fixed according to the fitness for work, and Ida gave the following example. In her peat-field the "norm" for a Group II worker was to clear eight rows, each 200 paces in length, and this was to be done in eight hours. Group III had only six rows to clear, and this was expected to take six hours. Both groups were therefore thought capable of doing the same amount of work per hour. If the "norm" was not completed within the set time the women had to go on until the rows were finished. If for any reason other than obvious illness the women failed to complete the "norm" they were liable to be given solitary confinement for one to three days. There was no corporal punishment.

All had one free day each week, but some had to do camp cleaning on this day. Although the women longed not to work they did not actually refuse, the reason being perhaps that, as will be shown later, in most cases good work guaranteed better food. All the women said that they were worked to their utmost capacity.

Payment for work was sometimes made in money, sometimes in goods. If, as in Elli's camp, they were paid in money they had to buy all their own food, but the earnings were enough to enable the best workers to buy as much as they wanted. The average worker or sick woman earned less and managed to buy only the food offered in the camp kitchen. In most camps it seems to have been the rule not to pay the women in money but to set the "norm" as the minimum amount of work which guaranteed free food. Extra work—graded in percentage above the "norm"—was rewarded sometimes by money payments and sometimes by material for garments.

The Food in the Camps

There was general agreement that the food was of very poor quality and inadequate in quantity during 1945 and 1946, but that it improved to some extent later. Despite this improvement all the six women except Elli said that they were always hungry. They usually had three meals a day, but Hanna and Emma had only two. The number and time of Emma's meals were determined by the fact that she had to work for eight hours without a break; meals were served in her camp only at 6 a.m., 12 noon, and 6 p.m. The staple items of diet were cabbage soup, bread, and *Brei*, which was a kind of soup made principally from cereal, but Emma received *Brei* only if her work was considered good.

On the average the women seem to have been given 600 to 800 g. of bread per day; the quality of the bread was, however, said to have been very poor. As a rule 0.5 kg. of sugar was issued once a month, but many months

passed without it. Ida said that the younger women often ate the whole pound straight off. She also ate stinging nettles which she had gathered on her way to work. They were eaten raw after she had rubbed them in her hands so that they might not sting her tongue. All the women agreed that the food was not adequate for the work they were expected to do. The meals never satisfied them, and Hanna said that she thought no one could have survived on the basic camp rations. In her camp extra food could be bought. In 1946 she sold her coat for 520 roubles to a Russian civilian and used the money to buy potatoes and some fruit. She said they were always looking through their belongings to see what they could turn into food.

In Margret's camp extra food also had to be bought, but only the men who were fellow prisoners were paid. The women were able to get some of the men's money by doing various jobs for them. Emma in the last two months was able to earn 930 g. of bread a day because, although she was in Group III, her output of work was that expected of a woman in Group II. This was her only way of getting extra food. Agnes could not get food for extra work, but managed to do some needlework and knitting for Russian civilians, who gave her potatoes and milk in exchange. Elli had a different story because her earnings were from 30 to 50 roubles a day and her basic food requirements only cost about half this amount. Bread cost her 3 roubles and 50 kopeks for 1 kg., and a small portion of *Brei* 80-90 kopeks. She was in the comparatively fortunate position of being able to supplement her diet out of her income with such extras as milk, but that cost 10 roubles for 0.5 litre. Meat at 80 roubles for 0.5 kg. was too expensive for her to buy.

The women were asked if they craved for any particular food. Elli said that she had no cravings, as she could have bought anything if she had wanted to pay for it. Ida longed for potatoes and meat—something "*kräftig*"; Hanna for potatoes and something sweet. Emma wanted milk and butter, Margret and Agnes wanted "proper" whole potatoes, *Brötchen mit Wurst*, and cake.

Living Conditions, Medical Care, and Illness

The permanent camps consisted of a collection of one to four wooden huts set in a compound and surrounded by a wire fence. In the larger camps the compound was about the size of a football ground. There was only one entrance to the camp, which was guarded. The number of women in each camp varied widely, from 80 in Hanna's camp to 1,000 in Emma's. In each camp there were usually a small number of German men who were civilian internees and who had been taken from their homes at the same time as the women. Twenty to thirty women occupied one room, spending their free time there during the day and sleeping there in beds which consisted of double-tiered wooden frames with straw mattresses. All the six women except Agnes had blankets, but she had to use her coat instead. Ida and Emma complained about the bugs, which disturbed their sleep. There was no possibility of any kind of privacy in the camp. Although washing facilities were more or less primitive, and soap was scarce, all the women agreed that they could maintain a reasonable standard of cleanliness. Emma, Margret, and Ida said that they were examined for lice once a week but that hair was shaved only if lice were actually found.

All but Agnes said there was a monthly sick parade, which was held by a German or Russian doctor. It was merely an inspection with the object of reclassification if necessary. In most camps a doctor was available to see acute cases and to decide if an illness was severe enough to prevent the woman from working. Elli said that to be

certified as sick there must be fever over 37.5° C., furunculosis, or a swollen face. In Ida's camp there were once considered to be too many women with temperatures over 37.5° C., and so the critical temperature was raised to 37.8° C.

In all except the smallest camps a room was set apart for women who were ill, and they were looked after by a nurse—usually a German girl, who did this instead of other work. This room was only for women who were really ill and was not available for those who merely needed rest. Severe cases were sent to the local civilian hospital or to the hospital of a neighbouring camp centre. Ida unfortunately had diphtheria in her first year. She was sent to the local Russian civilian hospital and was treated like the other Russian patients. She stayed there for four weeks, and was then sent back to camp, where she had to start work again immediately, although she complained of pains and stiffness in her legs, of water running out of her nose when she drank, and of difficulty with her speech. After five days' work she was seen by the Russian doctor, who put her on light work in the camp kitchen for three months. Her condition got worse and worse, and eventually she was sent back to the civilian hospital. There she rested for four weeks, and was then given some kind of light therapy, and her condition began to improve. The most common illnesses seen in the camps were typhoid and diarrhoea, malaria, and furunculosis. Tuberculosis and other lung diseases do not seem to have been especially prevalent. The six women attributed most of the illness to bad food, but Agnes said that much of the illness in her camp was due to the work with lime.

Nearly all the deaths of which the women had any knowledge occurred within the first year, and were attributed chiefly to the bad conditions. Even so, Elli thought that the women who died were those who let themselves go too much, who were very depressed and did not put up a fight. Some women who were beyond caring drank stagnant or polluted water and became ill and died. Some women actually went mad. Hanna told a gruesome story of the first months of her imprisonment, when food was very scanty and large numbers died. She thought that, in proportion to the total numbers, more men died than women. During these first months the whole camp was practically a hospital. Fatigue parties took out the corpses at night to bury them in mass graves. Wolves came and dug up the corpses and ate them, and Hanna was with a party which was sent out to rebury the bodies. Her uncle was one of those who died in her camp.

The six women were asked what illnesses they themselves had suffered from. Margret, Agnes, Hanna, and Emma all had oedema of the legs in varying degrees. Margret had it when she arrived in Russia, and said she noticed it more often on her days of rest than on working days. Her hands and face were also swollen. She and Agnes also had polyuria. As previously mentioned, Ida had diphtheria, and Elli and Hanna had malaria. Ida eventually owed her release to a periodontal cyst which increased steadily in size. The Russian doctors preferred to send her home rather than operate on her. Hanna had typhoid and what she believed to be nephritis. She, Ida, and Margret all had lice, but none of them had typhus. Among minor ailments which were not referred to as illness were very painful pins-and-needles in Elli's hands, Margret's breathlessness, palpitations, and hot flushes, and Agnes's giddiness. Elli, who had started to develop a goitre when she was 16, found that it almost disappeared when she was in Russia. It seemed to enlarge as her general condition improved.

Unfortunately only Elli was able to keep any record of her weight. She weighed 51.5 kg. in 1944, and only 41 kg. in 1947. She weighed 51 kg. on her return in 1948. Hanna, who in 1947 was able to weigh herself on the potato scales, thought that by then she had lost about 23 kg. from her 63 kg. in 1944. Ida thought that she was at one time about 7 kg. under her normal weight, and Margret and Emma merely said that they got very thin.

Lack of clothing was not blamed as a cause of illness. All six women were allowed to keep what clothing they had of their own, and in addition to this were given padded clothing for the winter. The materials they earned by extra work, and other materials and wool which were obtained by barter or purchase, were made up during leisure hours, and it was evident that a great deal of care and trouble were expended on the making of the garments. The women brought back with them to Germany underclothing, blouses, and cardigans, all of which were very well made and proved the interest that was taken in the work. In the early days before needles and other sewing materials were available the men in one camp made knitting-needles from pieces of wire. Skill in needlework was made to serve a double purpose, as some Russian civilians were willing to pay with food for knitting or sewing.

The walk to work and the work itself precluded any idea of physical activity in leisure hours. The women were usually confined to the barrack precincts, but in the last year or so some degree of freedom was allowed. Elli, Ida, and Margret could then go to the nearby village alone, and Agnes was allowed to go into the woods sometimes to gather mushrooms and berries on her free day. In Ida's camp there was dancing once a week to music played on home-made instruments, and in Emma's camp there was even a club with a wireless set and occasionally a film show. There was a reading-room in this club and German newspapers. Agnes said that there were no books in her camp; Margret said books were to be had, but she was not interested in them. The reaction of the six women to imprisonment varied according to their temperament, and most of them appeared to have accepted their fate in a way which, when they were questioned, was expressed by a shrug of the shoulders accompanied by some remark

such as: "We had to be contented"; "We did not worry much—it was no use"; or "*Was sollten wir machen?*"

The girls in Elli's camp were perhaps less apathetic. They were living under more normal conditions, because they were paid for their work, and although they had to pay for their own food they could improve their conditions by other purchases. This enabled them to maintain an interest in life, although, as Elli said, they had almost given up hope of ever returning home. They had ceased to worry about it, and disbelieved the rumours of repatriation. Hanna said she always thought, "I must get home," but she tried to be cheerful and to keep in good spirits because she realized that this gave her the best chance of survival. Agnes knew of one woman, aged 35, who tried to escape from Russia and reached Moscow before she was caught. She was said to have been sent to Siberia for fifteen years. The other women knew of no attempts at escape made by women, and laughed at the idea. In some camps a few children had been born, and Ida said that she liked to play with them in her leisure hours. None of the other women seems to have found any outlet for her maternal feelings, but no comment was made which indicated any appreciation of this lack.

The first chance of communication with relations came early in 1946, when most of the women were able to send postcards. Elli said that even the privilege of sending the first postcard was held out as an inducement for the best work. Ida and Elli were the first of the six to receive news from home, which they did in June and September, 1947, but Emma did not hear from her husband until March, 1948. Hanna had no news at all until she reached the British zone; the three other women had postcards from relations in the first three months of 1948. Margret and Agnes both said that not knowing what had happened to their families was almost the worst of their trials. Incidentally, Ida felt that the lack of freedom was the hardest to bear—even worse than the bad food, which was the chief complaint of the other women.

Menstruation and Sexual Feelings

Before their captivity all the women had menstruated regularly at intervals of 25–31 days, and the periods were normal. They all stopped menstruating in Russia, and their accounts are summarized in the accompanying Table. Only

Table Summarizing the Menstrual History

Name	Age of Menarche	Age when Taken Prisoner	Date of Last Period	Circumstances of Last Period	Date and Circumstances of Reappearance of Menstruation	Comments
Ida	17	18	April, 1945	<i>En route</i> to railway base	August, 1948, in Germany	No periods while she was in Russia, but a heavy yellowish discharge every 4 weeks. Headaches and "hot feelings" in the head at the same time as the discharge. She thought other girls had similar symptoms
Elli	14	18	April, 1945	<i>En route</i> to Russia in railway truck	January, 1946, while working on a collective farm. Periods regular for 3 months, then stopped when she began mine work and did not restart until 1947. Stopped again May, 1948, and restarted August, 1948, in Germany	The restart in 1947 was due, she thought, to better food she received at that time
Hanna ..	14	21	September, 1945	In hospital for typhoid and malaria	Not yet restarted	She was certain that cessation was due to bad food, as girls who worked in the kitchen menstruated as long as they were getting better and extra food. She herself menstruated "as long as she had any calories in her body"
Margret ..	15	23	January, 1945	At home	Not yet restarted	
Agnes ..	15	29	April, 1945	<i>En route</i> in railway truck	Not yet restarted	Had headaches and backaches every four weeks
Emma ..	16	34	March, 1945	While working for Russians (minding horses) before being taken prisoner	Not yet restarted	

Ida and Agnes noticed anything which might have replaced or formed a part of the normal menstrual cycle.

The women were asked if they were worried by the stoppage of periods. Hanna said that she was worried, but that the doctors reassured her. Margret, Agnes, and Emma were not anxious about it, and Emma thought it was "*sehr praktisch*." Hanna and Elli thought that normal sexual desires persisted, and Elli's replies suggested that if she had found a suitable partner she might have had intercourse with him. She was the only one of the four unmarried women who admitted that she was not a virgin before captivity in Russia. Ida was on very good terms during the last year in camp with a German boy aged 18, but the friendship was of an adolescent type and did not advance to sexual intercourse.

Since their return to Germany the two married women had met their husbands and had opportunities for intercourse. Agnes, who had had a number of years of married life before the war, said that, although she was happy to be with her husband again, she was "*zu schwach*" for sexual relations. Emma, who was married (at the age of 33) while her husband was on leave from the Army and had spent only one other short leave with him, said that her relations with him after their four years of being apart were perfectly normal. Margret dismissed the subject by saying that she was too young and that she was not interested in the men in the camps.

Four of the women knew personally women in their camps who became pregnant while they were in captivity, some of the fathers being German prisoners and others Russians of German or other descent. No details of the menstrual history of the women who became pregnant could be obtained. The children were born in the local hospitals, and all the mothers were able to breast-feed their children. Pregnant women received extra food from the sixth month and during lactation, and Elli said the children in her camp looked very bonny. These pregnancies were not the results of rape. All the women agreed that the danger of rape was over as soon as they were "*verladen*" into their cattle-trucks. (The word *verladen*, which was always used by the women when talking about their train journey, is normally never used for human beings but only for cattle and goods.) All the women except Margret were able to avoid rape during the critical first weeks, and regarded this as very good fortune. Margret said she had been raped "only twice"; she did not enlarge on this statement.

The Release from Captivity

During the last year there were rumours in most of the camps that release might be near for women in Group III. Previously only women who were unfit for work had been sent home. Release, when it actually came in July, 1948, was sudden and unexpected. Margret, Agnes, Emma, and Hanna were released because they were in Group III, and Hanna said that she was lucky in that the choice was made according to the classification of March, 1948. She had actually since then considerably improved in health. Elli was released because she had had an accident in her mine at Christmas, 1947. She had broken her collar-bone and two ribs when she was crushed between two trucks. Since then she had been on lighter work and made a good recovery. Ida, who was a Group I worker in the last two years, was sent home because of her dental cyst.

All the women gave a similar account of their return journey. Although they again travelled in cattle-trucks until they reached the border of the Russian zone at Frankfort-on-Oder, the conditions were very much better than on the outward journey, and there were no complaints of ill-treatment. They went from Frankfort-on-Oder to

Göttingen, where they were medically examined. The very great majority of all the women repatriated at this time were dismissed from hospital care or left hospital at Göttingen of their own accord to join relations in the western zones. Twenty-four women who preferred to stay under medical care after meeting their relations were sent to another hospital at the beginning of August, 1948, and the six women questioned belonged to this party.

Finally all the six women were asked what their plans were for the future. Margret hoped that when she was fully recovered she would be able to join her mother, who had come to the British zone and was trying to build up a home again in Hilden, near Düsseldorf. Ida expected to join her mother, now in a village near Krefeld, and had made inquiries about work in a factory where her brother was working. Hanna planned to keep house for her uncle and cousin in the British zone. Elli's family was widely scattered, and she could not decide what she would do. Her mother was still in her old home in Pomerania, and her father, who had been a prisoner of war in England, was working for a farmer in the Ruhr Valley. She had other relations near Münster and she might go to them. The two married women, Agnes and Emma, intended to join their husbands, who were trying to establish themselves in the British zone. They would leave hospital as soon as they felt completely well.

Summary

An account is given of the experiences of six German women who were taken into captivity in Russia. This account was compiled from the information they gave after they had returned to Germany. Great hardships were endured at first, but conditions gradually improved, and the women were in good clinical state on their return.

Menstruation ceased soon after the women were captured, and five of them had amenorrhoea for nearly three years.

P.T.A.P.: THE PRESENT POSITION

BY

LEWIS B. HOLT, M.Sc.

The Wright-Fleming Institute of Microbiology, St. Mary's Hospital, W.2

AND

GUY BOUSFIELD, M.D.

In the prophylaxis of diphtheria A.P.T. has certain drawbacks: it is not constant in its composition and, especially in adults, there may be unpleasant reactions. One of us (L.B.H.), working in the Wright-Fleming Institute of Microbiology, produced a purified diphtheria toxoid which instead of being precipitated by alum was adsorbed on to pure aluminium phosphate—a more suitable compound. To this prophylactic he gave the name P.T.A.P. (signifying *Purified Toxoid* precipitated by *Aluminium Phosphate*).

In November, 1944, it was decided that the results obtained in guinea-pigs with this new diphtheria prophylactic justified field trials (Holt, 1947). At that time we appreciated that numerous important problems arose in diphtheria prophylaxis regarding which there was very little accurate knowledge. These included: (a) the route of choice for inoculations—subcutaneous or intramuscular; (b) the dose of toxoid (Lf units) administered as adsorbed toxoid for the satisfactory mass immunization of children; and (c) the optimal amount of mineral carrier (AlPO₄) to employ. The new method gave us complete control of the composition of the prophylactic and therefore promised