Portraits from Memory

8—Lieutenant Colonel Frederick Murgatroyd RAMC (d 1951)

JAMES HOWIE

At the end of May 1941 I was ordered to go to Lagos to join with Fred Murgatroyd, the assistant director of pathology, in tests of yellow fever vaccine in the field. Two days before the orders came my African servant, a highly intelligent Ibo, advised me to expect them and what exactly they would be.

When I met Fred Murgatroyd in Lagos I found him a little sceptical about hopes that the new Rockefeller vaccine would prove stable enough for use in the field, but he agreed that it must be given a trial. On German radio Lord Haw Haw had told the world that we were about to attempt to spread yellow fever by the air route to Egypt and India in order to weaken the people of these countries and make them more amenable to British rule. As British intelligence advised us, the truth could always be discovered by standing Lord

Haw Haw's statements upside down; so they correctly deduced that we were trying to prevent yellow fever from spreading to Egypt and India by the air route.

Murgatroyd had with him a large thermos flask packed with ice around ampoules amounting to a total of 10 000 doses of dried vaccine, each dose worth 10 shillings (50 pence)—an expensive product in those days. We went to Yaba to collect from E C Smith (portrait 7) a cage of 30 suckling mice for testing the

potency of the vaccine at the end of each inoculating session, the hope being that some three to four hours after being reconstituted in saline the vaccine would be still potent, despite the unfavourable conditions in which it would have to be transported and used. In fact it proved to be still potent at least 12 hours later, but we were not to know that for sure until after our expedition ended. We also collected syringes, needles, and boiling water sterilisers. We set off by air with Smith's blessing.

It was my first flight and I questioned the pilot closely about how to act if things went wrong. He waved my fears aside. He was a civilian pilot, not an RAF type; and the plane was a DH86—so safe that it had been used to fly Mr Chamberlain to Munich in 1938. Murgatroyd and I and the mice were the only passengers and we put the mice at the back of the plane and kept the flask containing the vaccine at our feet in the front seats. As we approached the airfield at Minna, Murgatroyd, an experienced air traveller, yelled out, "We're going to crash!" He was right. The plane swerved off the

runway and into a cassava plantation with numerous trees. There was a bump followed by a crashing sound as the outboard starboard engine hit a tree, buckled the wing, and crashed through the plane, passing behind the pilot and in front of the passengers. Murgatroyd's seat was flung backwards and he suffered a severe blow on the back of his head. The engine swept on, missing me, but taking with it the flask of vaccine. My relief at being unharmed was turned to dismay as I realised that the vaccine was gone.

Diplomatic relations

I scrambled out of the wreckage and found the flask inside the engine cowl. I was struggling to free it when the pilot dashed up and urged me to desist—we might go up in flames at any moment. Happily we did not. The outer cover of the flask was intact but the sound of broken glass was ominously disconcerting. Fortunately, as we found later, the ampoules were not broken and the need was to get them at once into a refrigerator. The mice at the rear of the plane were all alive and well. Rescuers came running followed by the district commissioner asking, "How many dead? I have only two graves dug. The ground here is too hard at this time of year to dig any more now!" We reassured him that Murgatroyd's bang on the head was all we had suffered but that we must get this vaccine into a refrigerator at once. Gallantly he discarded enough from his own domestic refrigerator and saw to our and the vaccine's adequate accommodation. His name was Wilson and he was a son of the master who had taught me physics at school in Aberdeen.

A few days later we set off for Kano, Maiduguri, and Kaduna. At each of these places we assembled all the available African troops, many gathered from remote outposts, and held a series of inoculation sessions to which we invited African civilians so that no vaccine would be wasted. Fred Murgatroyd attended to all the logistics of assembling the troops and establishing good diplomatic relations with leading civilians. At only one of our points of call did he find some reluctance to accept our offer of vaccine. But Fred persisted, seemingly in vain, until, just as we were preparing to leave, a panting messenger arrived with a note saying, "Do not go yet. The King, the Waziri, myself, and other important people—we take your yellow fever vaccine. Many will follow our example." We had to delay our departure.

From Maiduguri we went on to Katsina on the frontier with Vichy French Niger territory. Fred made his way to the Emir of Katsina, with whom he established excellent relations. We were anxious to know how the Emir viewed the possible threat to the airfield from across the border. The Emir, a Cambridge graduate with excellent manners and an air of confident assurance, said that until a few weeks ago he would have discounted the risk. Hausa men on the two sides of the frontier were not interested in artificial lines; all Hausas would do what their Emir asked of them. But lately Senegalese troops had gradually been replacing the Hausas on the French side of the border; and that would guarantee a fight—so, perhaps it would come to that. Happily it did not.

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By the time our safari ended the first of the inoculated mice were showing signs of encephalitis after being inoculated intracerebrally with the reconstituted vaccine at the end of our inoculation sessions—a good test of potency. Later a few mouse protection tests carried out by Smith at Yaba on the sera of inoculated soldiers showed that the vaccine was effective even under the unfavourable conditions in which it had to be used. So it became possible to issue the new Rockefeller vaccine for widespread use by medical officers in the field, who were duly instructed in its use either by Murgatroyd or by Smith.

Incalculable threat

Yellow fever did not appear in Egypt or India. Whether our efforts with the vaccine determined this good result we shall never know. Murgatroyd was doubtful to the end. The risk was theoretically there, he agreed. In Egypt and India the transmitting mosquito was present and the population had never experienced yellow fever. The case mortality rate in susceptible populations could be any-

thing from 20% to 50%—and the Egyptians and Indians must be rated as susceptible, unlike the Africans, who might have yellow fever as a serious illness that could be fatal or one so mild that it might be only a passing fever of short duration. Perhaps, Murgatroyd argued, there were in Egypt and India viruses that could interfere naturally with the establishment of yellow fever virus even if it got there by an infected mosquito or passenger.

At any rate, we had done what we could against a threat which we could not measure but which could have been disastrous. Unfortunately there was an unwelcome price that had to be paid in the hepatitis that followed inoculation with some batches of Rockefeller yellow fever vaccine incorporating human serum. This was later replaced by harmless alternatives but until these hepatogenic batches had been identified and called in we continued to have to check whether outbreaks of jaundice with fever were due to yellow fever virus or not. Yellow fever vaccine is now rated as safe and effective for at least 10 years. Its successful use in the field in west Africa was a reassurance to the military authorities for whom the west African air route was essential until the enemy was cleared out of Africa in May 1943.

Lesson of the Week

Three cases of illness during a drug trial in healthy volunteers

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At the invitation of a drug company we undertook a trial to investigate the effect of an orally administered respiratory stimulant on respiratory depression caused by parenteral morphine in healthy volunteers. The drug has long been used safely intravenously, and tablets are already marketed in France.

The ethical committee approved the trial, with the drug company accepting full liability. Twelve paid volunteers consented to enter the trial. Satisfactory health was determined by history, examination, and blood profiles. Each volunteer attended four times to receive the trial drug or placebo, and morphine 0.12 mg/kg or placebo, in double blind and fully randomised fashion. Sedation, ventilation, pain threshold, and plasma drug concentrations were then assessed for eight hours. The trial proceeded uneventfully for five weeks, and seven volunteers began treatment.

Case reports

Case 1—A doctor received three treatments and then reported a maculopapular rash on her forearms followed by pain and swelling in the hand,

Healthy volunteers who become ill during a drug trial should be investigated by an informed physician not participating in the trial

elbow, and knee joints. She consulted a rheumatologist, who found that the full blood count, erythrocyte sedimentation rate, antinuclear factor titre, and results of sheep cell agglutination tests were normal. A viral aetiology was suspected and serum samples taken during the acute and convalescent phases of her illness. A drug reaction could not be completely discounted so she was excluded from the trial. Her symptoms resolved spontaneously over three days.

Case 2—A doctor received three treatments and then reported that he had rubella (self diagnosis). Symptoms began with a rash on the arms followed by slight malaise and arthralgia lasting for five days. He recovered and completed the trial.

Case 3—Two weeks after completing the trial a dentist noticed a rash on her arms followed by severe pain, stiffness, and paraesthesia in the hands, elbows, and knees. Her general practitioner prescribed aspirin and hydrocortisone and notified the trial investigators. Recovery was slow, with symptoms persisting for several weeks.

The trial sponsors were notified and the double blind code broken; this showed that the trial drug had been given once to one volunteer (case 1) and twice to the two others (once before and once after the illness in case 2, and twice before the illness in case 3). Inquiries in other centres investigating the trial drug showed that no other reactions had occurred, even to multiple and larger doses. The three volunteers affected had had contact with each other both at the trial and at work, but no similar cases had been reported locally. The trial was suspended pending further investigation.

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