**WMHS Presentation 5 July**

**Mystery Illness in the Dhala Valley February 1944,**

**A Doctor Investigates**

***Slide 2;***

This report, entitled **Secret. Social Conditions in The Dhala Valley February 1944, and** a second one, entitled **Social and Economic Conditions in the Wadi Hadhramaut** concerning famine there, have lain in my family files for many years. I thought it was time that it saw the light of day again and that this would be a most suitable forum for it.

***Slide 3:***

Both investigations were undertaken by my uncle Dr John Henry McCoy in 1944 while he was stationed as a Medical Officer in the RAF in Aden. He was my father’s older brother and only sibling, born in Ballymoney Co Antrim Ulster in 1913, before the country was divided into North and South, in May 1921.

He qualified at Queens University Belfast in 1936 - where I followed him in 1969- and he spent the next four years in resident posts in biochemistry, bacteriology and serology at the Royal Victoria Hospital in Belfast. It was during this time that he diagnosed my father – then a first-year dental student- with renal TB. The cure for this , by the way, was to spend two winters in the Swiss Alps undergoing heliotherapy.

Jack – as our family called him- obtained his DPH in 1941 and in that same year, he joined the RAF Medical Branch. He served as a pathologist with the RAF in the Middle East until 1946. Part of his time there was spent in Aden and he was mentioned in despatches in 1945 for his work on famine relief in Southern Arabia.

In order to explain why Jack was there at all, I should give you some history of this area. ***Slide 4***

As this map shows, Aden is on the south-west tip of the Arabian Peninsula on the Gulf of Aden. It was captured by the East India Company in 1839 and was governed from India. Starting in 1886, the Protectorate was formed by an amalgamation, initially of nine tribes in the hinterland of Aden and then more tribes further east in the Hadhramaut . Each tribe still maintained it’s sovereignty.

***Slide 5***

In the 1930s, the area was divided into the Eastern and Western Protectorates. However, Aden itself and it’s port were the only areas under full British Sovereignty.

In 1928 the British established Aden Command under the Royal Airforce leadership to preserve the security of the Protectorate. The name changed in 1936 to British Forces Aden, then British Forces Arabian Peninsula and finally, during Jack’s time there, it was known as Middle East Command (Aden).

Now the area is part of the Republic of Yemen.

***Slide 6*** shows the whole area of the southwestern peninsula. What I want to show you is how mountainous the whole area is.

***Slide 7*** is a simplified map of the area.

***Slide 8*** dated January 1965 amply demonstrates the various tribal areas and sheikdoms.

The famine in 1944 was caused by low rainfall then prolonged drought over the previous three years, compounded by a lack of foreign remittances following the invasion of Malaya and Java, and emigration of the menfolk elsewhere to find work.

 As a result of Jack’s investigations, carried out over two weeks, the RAF established famine relief flights, carrying 24 tons of grain daily to el Qatn, from where it was distributed by RAF transport and camel trains to surrounding relief centres.

However, it is his report marked Secret that I want to share with you this evening.

He was sent to investigate a mysterious and deadly illness, which was afflicting a large portion of the population in a region called the Dhala Valley, which lies some 80 miles north of Aden, 10 miles from the Yemen border at an altitude of about 5,000 feet. There were 7 villages visible in the valley: Dhala, Al Kaber, Al haud, Al Wa’ara Al Gallila Al Sameit and Rubat.

See map. His spelling differs from that used now.

**Social conditions *Slide 9***

In his report on the famine, Jack described the general population in the Hadhramaut as being comprised of:

Peasants, usually working palm groves from wells, on a share-cropping basis and living a precarious existence. They were usually in debt with payments having to be made to merchants, money lenders and taxes. In addition, in one specific area, there existed the Right of Oppression between certain tribes. The tribe holding this right – which was hereditary- was entitled to payment by way of a share of the crop or cash payment for abstaining from damaging the other tribe’s date palms. Failure to pay up resulted in the crop being plundered and sometimes the plantation being damaged permanently.

Merchants, concentrated in the larger populated centres

Seyyids. These are families who claim descent from the Prophet on the distaff (female) side and they form a hereditary privileged class who do not bear arms, nor do they labour. They form at least one tenth of the population and are regarded as holy. They frequently build large palaces and one such household had 42 cooks. Jack wrote that In general, that they were regarded as an intolerant sect but with notable exceptions in the area. He described the common salutation from a peasant to a Seyyid is hand grasping accompanied by sniffing of the hand of the Seyyid to scent the blood of the prophet.

I assume that the population in the Dhala valley was somewhat similar, except that the people in this valley were mainly peasants, tilling the soil, the chief crop of which was qat, not dates.

Qat had been introduced into the valley some 15 years earlier, simultaneously with the introduction of tea as a beverage and it caused a change in the political, social and economic structure of the valley.

***Slide 10:***

Qat, as you may know, is the leaves of a shrub Catha edulis, which are chewed like tobacco to release the alkaloids Cathine, Cathinine and Cathidene.

 In Arabia it is never used as an infusion. In large doses, it has the effect of a euphoric stimulant, similar to Benzidrene. In smaller doses, it is a sedative producing a deep sleep.

Jack reported that in the early stages of addiction it is reputed to act as an aphrodisiac and to increase sexual urge and staying power, which was an important consideration to an Arab community. However, after 2-5 years indulgence, side effects begin to appear, the earliest of which is impotence, then psychic changes, similar to the opium addict. Finally, a form of dementia supervenes.

The qat from Dhala was highly esteemed on account of the tenderness and delicacy of the leaves and it’s high alkaloid content. Jack was informed that due to this alkaloid content, it could not be crushed or smoked in a hubble-bubble. Apparently two inhalations were said to produce stupor, four, death.

 Addiction to qat was widespread in Yemen and in the Western Aden Protectorate and it was apparently more difficult to overcome than addiction to opium or hashish, both of which were in moderate use by Arab and Somali people. Somali women, but not Arab women, were permitted to attend a session to “eat qat”.

Consequently, Dhala traded more with the Yemen to the north and west, less so with the villages in the Protectorate to the south and it was a halt on the main caravan route South from the Yemen.

Needless to say, qat was a source of great profit to everyone except the peasant who grew and harvested it! Jack quoted a price of 3-4 rupees that the peasant received for a standard packet, comparing it to the 30-40 rupees the merchant received selling the same packet in Aden 24 hours later.

The standard currency in South Arabia was the Marie Therese dollar, a silver coin containing a fixed proportion of silver. It’s value in rupees was different in the various centres, with merchants usually making a good profit from small farmers in the exchanges.

Now to the illness.

Jack went to great lengths to obtain a clear picture of the nature, distribution, and incidence of the disease he was asked to investigate.

To this end, he spoke with:

 The Emir Nasir Bin Shaif, of whose household totaling 130 people, 41 had died since October 1943

The Keeper of The Rest House Dhala, whose two wives had been ill, one dying the day after his arrival.

The agent of the Emir of Dhala who had seen many sick people and was able to give detailed information about it’s incidence.

Finally, the relatives of sick people, and of those who had died, were questioned as to the course of the illness.

**The Nature of The Illness**

It was established that there had actually been 3 groups of illnesses occurring over the previous seven months.

The first, in August 1943, started suddenly with chills and fever. A scanty rash appeared on the abdomen, not earlier that the 6th or 7th day. About 1 in 10 people affected died. Those that did not remained fevered for 3 weeks then recovered.

However, convalescence was long and relapses frequent- described by the Emir as free from fever for a few days, then fever and prostration. Other signs were loss of hair and general oedema of the legs with swelling of the belly.

The second illness recognized by the people was called locally 7 days Fever. It showed itself by fever and chills ceasing abruptly after 7 days. There did not seem to have been any deaths associated with it.

The third illness was the one he was investigating. It had appeared 4 months earlier, in October 1943 and was characterized by a duration of 2 weeks. Death occurred on the 13th -15th day in the majority of cases. He noted that if death did not occur, convalescence lasted a further 12 days, with the patient gaining strength slowly over this time. Notably, a recurrence of the fever was never observed.

Slide ***11***

**The Symptoms of The illness**

During the first week, the patient was ill with fever and shivering and an intense headache. A rash then appeared on the chest and abdomen on day 3-4, occasionally day 5. This was extensive, covering the chest, abdomen and limbs and frequently affecting the neck and face. “Muck” was noted to run from the eyes.

After the first week, usually on day 8, the patient passed into a coma, characterized by ceaseless senseless talking, with periods of acute delirium or even mania.

 One man whose wife had died a short time before, volunteered that two nights before her death, she had been found washing imaginary clothes at midnight in a dry wadi near their house.

Sometimes after unconsciousness had set in, the limbs, face and trunk became enormously swollen. If the patient survived, this persisted throughout the period of convalescence.

A sign regarded as meaning certain death was the blackening of the rash on day 6 or 7. Death usually occurred 24 hours later.

Another sign was the rash appearing on the face and limbs at the same time as on the body.

The Keeper of The Rest House, whose wife was ill, stated that the rash had blackened on her right shoulder, neck and ear and she died 21 hours later.

Other people had noted that if the patient survived longer than 24 hours the skin came away over the blackened area leaving a sore. When washing the body after death, the skin peeled away at the slightest touch.

**Incidence:**

All the villages in the Dhala Valley which I mentioned above were affected.

All manner of people were affected, Arab and Jew and all classes with rich and poor being equally affected. Mortality was highest at the extremes of life.

When one household member became infected, secondary cases usually followed in 3 days. If this did not happen, then no other infections occurred in that household. As stated before, no reinfections occurred, even if fresh cases occurred in the same household.

**Mortality:**

Jack gathered information from the people, using an interpreter and checked on the graveyards.

Dhala: 200-300 persons died out of a population of 1000-1300

From the household of the Emir Nasir, 41/130 died. Bear in mind though that all the women and children who died may not have been included in these figures.

He visited several homes to see sick patients. Here are a couple of examples:

1. The Emir requested that Jack visit Zubed, 4 miles south of Dhala to see his agent who was ill. The man was about 30 years old, moribund with Hippocrative facies, Cheyne-Stokes breathing, grossly emaciated with an extensive red papular rash, which did not fade on pressure, covering his trunk and limbs. On the sacrum and right trochanter where the rash had blackened the skin had ulcerated leaving lesions not resembling bed sores, in that there was extensive oedema and haemorrhage into the subcutaneous tissues. A bad prognosis was given, and death occurred 7 hours after Jack saw him.

The Hippocratic facies was first described by Hippocrates and consists of, a pinched nose, sunken eyes, hollow temples, cold and retracted ears, dry and tense skin on the forehead, livid complexion and the lips pendent, relaxed and cold.

1. The Sheik of Zubed, 25 years old in the 11th day of his illness and 3rd day of coma. He was in a muttering delirium and had a macular red rash more marked on his trunk than on his limbs.

Jack also observed that the Sheik continually coughed up thick tenacious and abundant sputum of a creamy colour with very few physical signs in the chest except an occasional coarse crepitation to account for it.

Jack made the diagnosis of **typhus** when he was in Zubed. He then wanted to see as many cases as possible in Dhala itself, but in this he was disappointed, as the epidemic in Dhala appeared to have passed its peak and was now in decline. He stated that in the poorer quarter of the town he had full scope, entering houses where men were lying sick. seeing convalescents in the street or in the compound Infront of the house. Sick women and children who usually live in the women’s quarters could not of course be visited. From all the sick people and their relatives, he received the greatest consideration and courtesy.

He also saw other illnesses not deemed to be the infection in question:

1. Male late 20s in day 19 of a febrile illness, conscious and cooperative, no rash, greatly enlarged and tender spleen and tympanitic abdomen. His fever had been continuous but was now less. (Typhoid)
2. A female child aged two who was convalescing. She had extreme muscle wasting with a protuberant abdomen with much widening of the costal angle and flaring of the lower ribs, palpable spleen and a dusky red rash on the dorsa of her hands and extensor surfaces of her forearms. (Typhoid)

**Symptoms in Convalescence: *Slide 12***

Deafness, muscle weakness with difficulty in walking, general emaciation, headache.

**Summary: (Quote from actual report)**

This is the description of an epidemic which commenced in the Dhala valley near the Yemen border in August 1943 and which is continuing.

The disease is one which is not familiar to the natives of Dhala and which is characterized by a clinical course of two weeks, terminating in death or recovery. The outstanding features of the condition are fever and chills for eight to nine days with an extensive rash appearing on the trunk and limbs on the 3rd or 4th day. After the 8th or 9th day the patient becomes stuperose. Convalescence is long but re-infection does not occur. Secondary cases in a household occur within two or three days of the primary case. Mortality is high.

His diagnosis of the third illness, based on his observations of patients and histories obtained from their families, was **epidemic typhus.**

***Slide* *13 and 14.*** However he could not confirm this diagnosis serologically.

The other types of typhus are Murine- spread by fleas that have been infected by rats- and Scrub Typhus, spread by chiggers or mites.

Jack concluded also that the illness in the first epidemic consisted of cases of typhoid and typhus with typhoid predominating.

***Slide 15 and 16***

**Discussion:**

In his Discussion, Jack noted that “the Arab is an acute observer and circumstances have forced him in Dhala to closely to observe an illness which was quite unknown to him. He is familiar with malaria, smallpox and syphilis and can describe their salient features in a reasonably compact and sufficient manner, so that there can be no question of his ability to observe the salient features of a new disease whose general incidence and high mortality have impressed themselves on all observers.”

It was known that epidemic typhus was present in Sa’ana, having been confirmed serologically in June 1943 and was widespread throughout the Yemen.

Given the trade routes from Dhala to the Yemen – a matter of 10 miles distance - and the export of qat, it was deemed only a matter of time before the disease spread down there.

With regard to the transmission of the disease, Jack thought it was due to lice. His Arab guard was not impressed though, stating that if that were so, then everyone in the valley would die from the illness as they were all infected with lice.

**Slide 17:**

Figures were provided for the number of deaths in all the villages in the area of Lower Yemen, which were at least 12,000 and probably many more.

Ending his report, Jack wrote:

“My best thanks are due to the many people who have provided me with information, to Mohammed Ahmed Maqtari my interpreter, to Haidera Am’ Awdh Quatibi my bodyguard and the various members of the tribal guard who accompanied me at all times. To the Emirs Nasir bin Shaif of Dhala and Haidera bin Nasir of Jihaf, whose hospitality and kindness were overwhelming and finally to Major Seagar who suggested the investigation and Group Captain Forman Principal Medical Officer Aden Command who released me from duty to undertake it.”

After the war, Jack joined the Public Health Laboratory Service, working initially in Cambridge ,then moving to Hull when he was appointed Director of the Hull Public Health Laboratory in 1952. His interest was environmental hygiene, with a special interest in salmonella – the bacterium which causes typhoid- and several new subtypes were first isolated in his laboratory.

He gained a position as the foremost sanitary bacteriologist in the PHLS and had an international reputation as an expert adviser on the microbiology of rearing poultry, cattle, and pigs and on the monitoring of foods water and milk. He was Editor of the Journal of Hygiene from 1973-1982 and a noted raconteur- of course, being Irish!