THE MECCA PILGRIMAGE

Its Epidemiological Significance and Control

By WASFY OMAR, M.B., Ch.B.(Cairo), Dip. Hyg., D.T.M. & H.(Camb.)

The Islamic faith demands that Moslems, at least once in their life, should perform the pilgrimage to Mecca, provided they can do so. It is not enough to visit the holy places in the Hedjaz at any time of the year. Merit can be acquired by only participation in the mass demonstrations of faith decreed to take place every year on the tenth day of Zilhidge, according to the Mohammedan calendar. No sacrifice is too great for any Mohammedan to fulfil this sacred duty. Some indeed devote their whole life to the attainment of this sacred mission.

The great majority of pilgrims are from the middle and poor classes. Some are extremely poor; they have nothing but faith in their hearts and a stick in their hands; they walk from their home countries, sometimes for years, begging their way to the Hedjaz. Others can afford only the expenses of their outward journey. This destitution of the pilgrims led many governments, supported by the international sanitary conventions, to take certain measures to prevent the departure of any pilgrim unless he first pays for his return ticket.

Every year, three months before the date prescribed, thousands of Moslems from every part of the world converge in large numbers on Mecca. In the early years the majority came by caravan across the Arabian deserts, Asia and Africa from the north, south, east and west. Now the majority come by sea and a great number travel by air.*

Wherever they arrive in the Hedjaz, all the pilgrims converge on Mecca. The small sacred town becomes gradually crowded with them. On the ninth day of Zilhidge, 'the day of Arafat,' they all assemble at Mount Arafat. There, about half a million Moslems gather for the consecration of the pilgrimage. Mount Arafat is a bleak, open hill, about 12 miles east of Mecca. Here, clad only in the symbolic garb of purity, an unstitched

white sheet, the pilgrims must pass their first day of pilgrimage.

In the evening of the same day, they move to Mozdalifa, about four miles from Mount Arafat. Here, they camp for the night, and the next day they proceed to Mouna, about two miles further on to Mecca, where they stay three or four days under tents erected in these sacred valleys of the desert, devoting themselves to their religious ceremonies.

The pilgrimage ceremonies at Mouna are characterized by one of the most important traditions; the celebration of the sacrifice of offerings. Thousands of animals (camels, sheep, etc.) are slaughtered in the camp. The huge quantity of meat, which cannot possibly be consumed by the pilgrims, is either left on the ground or incompletely buried, and within a few hours under the burning sun, this creates a big sanitary problem.

On the twelfth or thirteenth day of Zilhidge, the pilgrims move to Mecca to fill again the sacred little town to overflowing and to live necessarily in conditions of appalling overcrowding. Their devotions include one important function: every pilgrim must drink of the holy water of the Zam-Zam well; moreover, some pilgrims take with them for distribution to their nearest and dearest at home, tins full of the holy water. The Zam-Zam well is a shallow, open well from which the water is drawn by buckets. This water has always been liable to contamination with germs of intestinal infectious diseases. This is why it is stressed that the drums containing Zam-Zam water, carried by returning pilgrims, be regularly steam disinfected at the Tor (Egypt) Quarantine Station,† on the return of the pilgrims. They

† According to the provisions of articles 135, 140, 141 and 142 of the International Sanitary Convention (Paris, 1926), all ships carrying pilgrims from the ports of the Hedjaz and going north must call at Tor quarantine stations to undergo sanitary measures of medical examination, observation, disinfection, etc., before they are allowed to proceed on their voyage.

* In the 1951 pilgrimage, 12,687 arrived to the Hedjaz by air. The number of pilgrims arriving by air greatly increases year by year.

must be destroyed if an outbreak of cholera happens to occur in the Hedjaz, a precaution which was found necessary after the isolation of cholera vibrios from water drums at the Tor Camp Laboratory.*

With the return of the pilgrims to Mecca, the pilgrimage ceremonies come to an end and the mass begins to break up and disperse.

The Sanitary Dangers of the Pilgrimage

The conditions under which the pilgrimage to Mecca is performed, particularly by pilgrims who are not well provided with this world's goods, are so rigorous as to be a severe strain on even the strongest. A large number of the pilgrims who proceed to Mecca are old and infirm; some of them desire to undertake the pilgrimage only with the object of dying in the Holy Land.† A pilgrim who is in ill health is more liable to be a focus of infection than one who is in robust health. It was found by experience that while deaths among pilgrims on their outward voyage are comparatively rare, the mortality after the pilgrimage ceremonies and on their return voyage is very high even in the absence of epidemics. The mortality in the 1924 pilgrimage was 4 per cent. among the Egyptians and 22 per cent. among the Javanese.

The Arabic (lunar) year does not correspond exactly to the Christian year, but is 11 days shorter. Thus, the date fixed in the Arabic calendar for the pilgrimage, ninth of Zilhidge, does not fall on a fixed day according to the Christian calendar, but falls in every succeeding year on a date 11 days earlier. The pilgrimage may be, therefore, at any time of the year. This means that pilgrims are subjected to the severest climatic conditions ranging, according to the date of the pilgrimage, from the merciless winds of a desert winter to the fiercest heat of summer. It is not surprising that *heat stroke* claims many victims under these conditions. In last year's pilgrimage as many as 753 deaths were recorded in one day at Mouna; most of these were due to heat stroke.

The Mecca Pilgrimage and Epidemics

Pilgrimages in general, involving the collection in one place of large numbers of people, have always been, even with the utmost sanitary precautions, a potential source of serious epidemics.

* According to some reports, the origin of the terrible epidemic of cholera which broke out in 1902 has been attributed to the fact that a pilgrim had poured some Zam-Zam water into the well of his home village (Mousha, in Upper Egypt); and that from this the epidemic started.

† This led many countries to submit their pilgrims to a medical examination before allowing them to proceed to the Hedjaz.

During the Mecca pilgrimage, there is a huge gathering of people of different races, the majority of whom come from countries where many of the pestilential diseases are endemic.

The Mecca pilgrims, travelling sometimes under precarious and unhealthy conditions and being liable to carry with them the germs of cholera, plague, smallpox, etc., from their home countries, have, by their agglomeration, often made of the holy towns of Islam a dangerous centre from which epidemics of pestilential diseases spread all over the world. Any epidemic disease could start there and spread to the home countries of the returning pilgrims.

Malaria, *dysentery* and other water-borne epidemic diseases have always been common among returning pilgrims. Until vaccination of pilgrims was made compulsory by most of the countries, *smallpox* was very common. The last outbreak occurred in 1949 when 545 smallpox cases and 198 deaths were recorded.

The great *plague* pandemic of 1896 menaced the pilgrimage for the first time and it reappeared in Jedda in the following year. The infection was thought to have been introduced by pilgrims' caravans from Sanaa (Yemen), where plague was prevalent. Only a few cases appeared among the returning pilgrims. After 1897 plague was declared in the 1898, 1899, 1900, 1907, 1909, 1910, 1913-14 and 1918 pilgrimages. None has been reported from the Hedjaz since 1918.

Although plague has been considered in all the international sanitary conventions on equal lines with cholera, experience showed, that it has never been of the same epidemiological importance in pilgrimage as cholera. In all these 'infected' pilgrimages, plague appeared mainly among the inhabitants of the Hedjaz. Victims among pilgrims were few. The preventive anti-rat and quarantine measures which are taken at the present time in ships can be considered a sure safeguard against the spread of plague.

Of all the diseases which have attacked or threatened the pilgrimage, none has been so serious and so disastrous as *cholera*. The wide spread of cholera through the Mecca pilgrimage to Europe and to the rest of the world was the first alarm which led to international agreements putting the pilgrimage under effective sanitary control. With pilgrims coming from areas in which the disease is endemic and subjected to conditions of living which could light up an infection or favour its spread, it is not surprising that cholera has been the worst enemy of the pilgrimage.

The fourth big pandemic of cholera, to quote one example, arose through the pilgrimage of 1863. Cholera, brought by pilgrims from Java, broke out first in Mecca. After the pilgrimage and the dis-

persion of the pilgrims, infection was carried by African pilgrims on their return to their own countries. Cholera appeared, thus, in Egypt and in all the ports of the Mediterranean, whence it reached, by means of emigrants, the Senegal and North America, Brazil and Paraguay.

In 1831, a fatal year, cholera appeared at Mecca, it is thought, for the first time. Between 1831 and 1865 eight epidemics occurred in the Hedjaz (1831, 1840-41, 1846, 1850, 1855, 1856, 1859 and 1865).^{*} Fifteen more epidemics appeared during the period 1866-1912 (see Table). Since 1912, cholera has not been reported from the Hedjaz. Before 1866 pilgrims used sailing vessels in their voyage to the Hedjaz. The voyage was long and the number of pilgrims was not great. After 1866 steam navigation was utilized to carry pilgrims from India and Egypt to the Hedjaz. It diverted to its profit the conveyance of numerous Moslems, to the prejudice of caravans which were true 'itinerant quarantine,' enabling with their slowness any epidemic to fade out in the desert, and so no infectious disease was carried to the pilgrims' home countries.

After the last three outbreaks of cholera in the Hedjaz in 1910, 1911 and 1912, the disease appeared in 1927 in Iraq and in 1947 in Egypt, but in both cases it neither appeared in, nor originated from the Hedjaz.

A study of the available epidemiological data may lead to certain conclusions:

(1) The cholera outbreaks occur mainly during the *pilgrimage period*, i.e. one or two months during which the ceremony days fall.

(2) The epidemics reach their maximum on the days of the ceremonies at Arafat and Mouna, when the agglomeration of all the pilgrims takes place.

(3) As the epidemics occur at a fixed period according to the lunar (Arabic) calendar, which does not correspond with the Christian calendar, this means that the epidemics may occur in any month of the Christian year (January to December), at any time in any of the four seasons of the year. Cholera outbreaks have occurred in winter as well as in summer, evidence which excludes atmospheric conditions as a factor in the epidemiology of cholera in the Hedjaz. A study of the records of the cholera epidemics in the Hedjaz shows, however, that the winter epidemics are longer and more frequent than the summer epidemics.

(4) The cholera epidemics occurred usually in groups from 1855 to 1866, from 1881 to 1883, from 1890 to 1895, and from 1907 to 1912. This

^{*} According to some sources 13 epidemics, to others 12 occurred during that period. It is agreed that cholera did not exist in the Hedjaz before 1831. It is not endemic there, but was always traced to imported sources of infection.

probably means that cholera existed in the Hedjaz in endemic form between these years and was revived in epidemic form in the following pilgrimages.

How Does Cholera Enter the Hedjaz?

Since cholera was introduced to the Hedjaz in 1831 by pilgrims, it seems that it has returned always with them. It arrives before the feast, reaches its maximum activity during the ceremonies and drops sharply with the dispersion of the returning pilgrims. It arrives in the Hedjaz nearly always by sea and from the south. Exceptionally it may come by the land routes. In 1846 and 1872 it was introduced by land from the north (Iraq), and in 1859, 1890, 1891, 1893 and 1902 by small caravans from the south (Yemen and Assyr).

In the early epidemics of cholera in the Hedjaz, infection could be introduced by a case among the pilgrims coming from a country where cholera was prevalent. In its early years, the quarantine barrier in the Sanitary Station of Kamaran Island[†] was probably not entirely efficient.

In 1926, however, four cases of cholera were landed from a pilgrim ship coming from Calcutta and were isolated at Kamaran Sanitary Station. No cholera appeared in the Hedjaz that year. This incident seems to support the preceding conclusions and may be taken as an evidence of the efficient part which may be played by a quarantine barrier in preventing the spread of infection if such a barrier functions properly. At the present time a great number of pilgrims travel by air and may arrive in the Hedjaz from their infected countries within the danger (incubation) period. The role of cholera carriers in the transmission of cholera becomes of major importance, particularly the incubating carrier. The other two types of cholera carriers, the contact (or healthy) carriers and the convalescent carriers, do not seem to play a significant part in the transmission of cholera.

Some authors believe that the vibrios from a contact carrier are not dangerous because they are 'mutants,' and there is evidence that during convalescence an increasing proportion of the vibrios excreted by convalescent carriers are in process of losing their pathogenicity.

[†] According to the provisions of articles 122-125 (International Sanitary Convention, 1912) and articles 127-130 (International Sanitary Convention, 1926), quarantine measures of inspection, isolation, disinfection, etc., are taken on *all* pilgrim ships coming from the south and bound for the Hedjaz, which *must* put in at Kamaran Sanitary Station before being allowed to proceed to Jedda.

CHOLERA EPIDEMICS IN THE HEDJAZ (1866-1912)

Years of Pilgrimage	DEATHS FROM CHOLERA					Duration of epidemic in Mecca		Date of the Feast of Sacrifice
	In Mecca	In Jedda	In Medina	In other areas	Total	From	To	
1866	Information incomplete (very small outbreak).							
1871-72 ..	Information incomplete (infection introduced by land route from Kerbela).							
1877-78 ..	787	186	101	343	1,415	Dec. 24	Jan. 11	Dec. 14
1881	2,473	121	283	1,415	4,292	Sept. 16	Jan. 30	Oct. 31
1882	324	12	254	32	622	Oct. 23	Nov. 10	Oct. 21
1883	455	11	182	—	648	Oct. 14	Nov. 12	Oct. 12
1890	2,538	1,337	461	103	4,439	July 28	Aug. 22	July 28
1891	2,942	256	9	—	3,207	July 11	Aug. 20	July 16
1893	30,336	2,408	250	—	32,994	June 8	July 19	July 23
1895	306	—	—	—	306	April 22	May 22	June 2
1902	4,000	314	399	666	5,379	Feb. 20	April 8	Mar 19
1907-08 ..	4,745	379	260	224	5,608	Dec. 14	Feb. 7	Jan. 13
1910-11 ..	142	19	657	37	855	Dec. 26	Jan. 27	Dec. 1
1911	1,536	311	171	—	2,018	Sept. 2	Dec. 21	Nov. 1
1912	3,339	417	142	—	3,898	Sept. 22	Dec. 11	Nov. 1

The International Sanitary Control of the Mecca Pilgrimage

For the last 70 years the sanitary problems connected with the Mecca pilgrimage have been recognized as being of great international importance. The Hedjaz has, on several occasions in the past, proved to be the corridor through which various infectious diseases, mainly cholera, have spread from east to west. Consequently, since international sanitation became a subject for discussion between the nations of the world, it has been realized that special precautions should be adopted with respect to the Mecca pilgrimage.

The first international health conference was held in Paris in 1851. Many other conferences followed, but unfortunately all failed to reach agreement. As a result of the early conferences, however, some of the countries concerned, without being bound by any international agreement, applied some of the recommendations suggested by these conferences with regard to the Mecca pilgrimage. The first measures were applied in 1858. Ships carrying returning pilgrims and having on board cases or suspected cases of cholera had to be put under quarantine for ten

days. This period was reduced to five for ships with no such cases.

In 1895 it was recommended that a medical officer should on board every pilgrim ship. The number of pilgrims who could be carried by a ship was fixed according to its tonnage after the 1864 conference.

Cholera continued to break out in the Hedjaz. It was only after the 1892 conference that the First International Sanitary Convention was signed and the Mecca pilgrimage was dealt with for the first time under international agreement.

A comprehensive study of the problem was made and a certain number of measures were prescribed. It was agreed that pilgrim ships should be provided with a disinfection stove and that they should carry a qualified doctor on board. Quarantine control was imposed on all ships returning north after the pilgrimage. The Tor Quarantine Station in the Gulf of Suez was chosen for this purpose. All ships coming from the Arab Coast of the Red Sea and carrying pilgrims should call at El-Tor Station, where the pilgrims are put under observation for a period of 15 days if the ship carries an unclean (for cholera)

PILGRIMAGE STATIONS

PILGRIMAGE ROUTES

bill of health, and for a period of three to four days, if the ship carries a clean bill of health.

The same measures were also applied to the Egyptian caravans returning from the Hedjaz.

The organization of the El-Tor Station was dealt with in the 1892 convention as regards per-

sonnel, equipment, disinfection stoves, sanitation, provision of food and water supply.

Further measures were added in the 1894 Convention. It was prescribed that 'pilgrims are not allowed to proceed to the Hedjaz unless they deposit a sum of money to cover the expenses of their voyage and the maintenance of their families during their absence; that all pilgrims are submitted to a medical examination at their home ports of departure; that no cholera or even diarrhoea cases are allowed to leave; that all pilgrims are disinfected before embarkation; that if the port of departure is infected with cholera, all pilgrims are put under observation for a period of five days before embarkation.' A detailed description was also included on the sanitary equipment of a pilgrim ship as well as the measures of sanitary control of these ships before and during the voyage. 'All pilgrim ships coming from the south had to put in at Kamaran Sanitary Station, where the pilgrims are submitted to quarantine control before proceeding to the Hedjaz.' Medical examination and disinfection of returning pilgrims had also to be made at the Hedjaz ports of departure (Jedda and Yambo).

A new convention was signed in 1897. The preceding conventions dealt only with the problem of cholera. Measures similar to those against cholera were added in the 1897 Convention for plague. Six years later a new convention was drawn up (Paris, 1903) followed by a second one in 1912. No cholera has appeared in the Hedjaz since 1912. In 1926 the last International Sanitary Convention was signed in Paris. These last three conventions contained nearly the same pilgrimage provisions as those in the preceding conventions with little modifications.

The 1926 Convention was, however, supplemented with two agreements:

The Anglo-Dutch Agreement (1926) on the control of the pilgrimage traffic from the south at Kamaran Quarantine Station, and the Middle East Arab Countries Agreement (1929) on the principal measures to be taken to ensure health conditions and security for the pilgrims of this region.

In the second agreement, vaccination against smallpox and anti-cholera inoculation were made compulsory for all pilgrims before they left their countries for the Hedjaz. Provision of 'special pilgrimage passports' and the compulsory use of determined itineraries by the pilgrims on their way to and from the Hedjaz were also decided upon by the countries signing the agreement.

Having among its functions the administration of the existing sanitary conventions, the World Health Organization considered it necessary to revise and consolidate all the conventions in force at present, and drew up, in the light of recent advances in epidemiology and prevention, new 'sanitary regulations' to replace them. These W.H.O. 'International Sanitary Regulations' will come into force in October 1952. In view of the special epidemiological significance of the pilgrimage, it was found advisable to maintain the rules governing its health control in the new

regulations, with certain modifications of the pilgrimage provisions in the convention of 1926.

Since a large number of pilgrims now travel to the Hedjaz by air, special provisions had to be drawn for the sanitary control of the pilgrimage by this means. The standards with which ships and aircraft carrying pilgrims must comply have been collected in Appendix B of the regulations. According to these regulations, pilgrims must be vaccinated against cholera and smallpox, and a valid certificate of vaccination against yellow fever is also required from those coming from a local area infected with yellow fever or from a yellow fever endemic zone.

The Kamaran Quarantine Station which has until now been responsible for the sanitary control of pilgrims coming by sea from the south, will be closed; its functions will be taken over by the quarantine station now under construction at Jeddah.

In the case of non-infected pilgrimages, pilgrim ships returning northwards will be submitted to sanitary control at Suez instead of Tor as was the case under the 1926 Convention.

Plague, cholera, yellow fever, smallpox, typhus or relapsing fever may cause a pilgrimage to be considered to be infected, in which case sanitary control of the returning pilgrimage has to be made at Tor and Jeddah Stations.

NOTES

Pharmaceutical Specialities (May & Baker) Ltd., announce that 'Phenergan' brand promethazine is now available in the form of 2 per cent. cream. This product is indicated in the palliative treatment of skin conditions of an allergic and sensitization type, either alone or in association with systemic antihistamine therapy. It is a powerful antipruritic application in all conditions characterized by intense itching and marked pain and has proved valuable in the early treatment of superficial burns and scalds where its application appears to limit blister formation and oedema.

In allergic disorders and dermatological conditions 'Phenergan' cream should be rubbed in gently and, if possible, a further quantity spread on gauze should be applied under a light bandage. In burns and scalds the cream should be applied directly to the injured area.

'Phenergan' promethazine cream is available in containers of 1 oz. and 1 lb.

In our issue of November 1951 we published an article on 'Resection with Restoration of Continuity in the Treatment of Carcinoma of the Rectum and Rectosigmoid' by Mr. J. C. Goligher. It was explained by the author that this paper was based on a collective series of cases treated by certain members of the Surgical Staff at St. Mark's Hospital. Unfortunately they were not actually nominated and Mr. Goligher would like us to rectify this omission and state that the surgeons concerned were Messrs. C. Naunton Morgan, O. V. Lloyd-Davies, H. R. Thompson and himself. He would also like us to make it quite clear that the great majority of the cases in the series referred to were patients of these colleagues, two of whom have already reported on their experiences with this type of operative procedure (Lloyd-Davies, O. V., 1948, *Proc. Roy. Soc. Med.*, **41**, 822. Lloyd-Davies, O. V., 1950, *Proc. Roy. Soc. Med.*, **43**, 706. Morgan, C. N., 1950, *Proc. Roy. Soc. Med.*, **43**, 701).