
BY CAPTAIN R. MCKINLAY.
Royal Army Medical Corps.
Late Allied Sanitary Commissioner.

There were, during the year under review, two Allied Sanitary Commissions:—

(1) The Interallied Urban Sanitary Commission, of which the D.D.M.S. was President and on which I was the executive officer from June 1, on which date I assumed the duties of Allied Sanitary Commissioner. This Commission interested itself in affairs affecting the public health of the town, such as communicable diseases of all kinds and epidemiology, cleanliness of the streets, drainage, sale of foodstuffs, narcotic drugs, etc., registration of doctors, pharmacists and druggists, water supplies, and all such questions as would interest a medical officer of health in England.

(2) The Interallied Maritime Sanitary Commission, or to give it its proper designation, La Commission Sanitaire Interalliee Maritime et des Frontieres, under the Presidency of the French Director of Medical Services, on which Commission I represented the British Army. Its functions were concerned chiefly with the prevention of the importation of infectious diseases from outside into Constantinople or westwards into Europe.

It will be easily seen that the work of the two Commissions was largely interconnected, and that much of my work as executive officer originated from the Maritime Commission and the various controls put into force by it.

There were two sanitary controls for shipping under this Commission throughout the year, one at Kavak, where there is a Turkish Lazaret and disinfecting station; it is situated inside the northern entrance to the Bosphorus on the Asiatic side, and controls all ships coming into the Bosphorus from Russian and Black Sea ports. The other is situated at Chanak at the entrance to the Dardanelles, and deals with vessels desiring to enter the port of Constantinople from the Aegean Sea.

At each of these two places, in addition to the Turkish staff, there was one Allied Medical Officer, found in turn for a period of two months at a time by the French, Italians and ourselves; these officers worked under the Maritime Commission and were responsible to it; they visited all ships and gave pratique or otherwise, according to the conditions on board.

CIVIL ADMINISTRATION OF THE TOWN.

As this is a somewhat complex and ponderous organization, perhaps a short description of it would not be out of place.
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It was partly Municipal and partly Governmental with considerable overlapping, and as both Municipality and Government were in a state of bankruptcy during the year, it was only by continual driving and supervision that a moderate degree of efficiency could be maintained.

The municipal services deal with the general sanitary services of the town, street cleaning, municipal hospitals, attendance on the poor, public vaccinations, burial certificates, inspection of butchers' shops and bakeries, etc., and also with infectious disease, except plague, cholera, smallpox, typhus and relapsing fever; these latter were under the Service de Santé Publique Ottomane, a Government control known as the "Infectious Disease Department." The Government also controls the Venereal Disease Department, the Bacteriological and Analytical Laboratories, the Anti-Rabic and Vaccine Departments, the Lunatic Asylum and one hospital, the Children's Hospital. Both these administrations worked under the Interallied Urban Sanitary Commission until October, when the Angora Government assumed office in Constantinople.

How necessary it was that we should assume control of these services was immediately apparent on the arrival of the Allied Armies in Constantinople at the end of 1918; the condition of the streets at that time required to be seen to be believed; there were dumps of refuse of all sorts in side streets and on waste areas which must have been the accumulation of years; and it required a full year's work with a greatly augmented staff before these were removed.

It took still longer to make the extremely undisciplined public realize that the most simple and elementary sanitary laws must be obeyed. Such things as refuse boxes were practically unknown; householders disposed of all their refuse by the simple expedient of throwing it into the street. Fines for this offence were for a long time a fruitful source of revenue to the Allied Police, until gradually the public came to realize that although causing a little more trouble, it was cheaper and more sanitary to keep a refuse box for the municipal dustman to empty. All the other ordinary rules of hygiene were honoured in much the same way.

I remember well the difficulty with the Greek populace when the Sanitary Commission decided that the practice of removing a corpse for burial in an open coffin through the streets was unnecessary and undesirable, even although the deceased had died of a non-infectious disease. They were quite willing to admit that in the case of death from smallpox, for example, it should not be done. However, with the co-operation of the Greek Patriarch this time-honoured custom (originated, I believe, by the Turks to prevent the smuggling of arms from place to place) fell into disuse, and now it is never seen.

Amongst the local medical men who assisted the Commission there were a few genuine workers who did not seem to be impregnated with the Oriental lethargy which appeared to have completely overcome the others. On the other hand, it must be remembered that Turkish doctors were supposed
to be working for a monthly pittance (often paid months in arrears) which was not equal to the weekly wages of many miners or skilled mechanics in England; hence there was no incentive to work, and their invariable custom was to sit in their offices, smoke innumerable cigarettes and drink innumerable cups of coffee, but when they realized that we really took a genuine interest in their work and their welfare, and that intrigue of any sort was not countenanced, there was a marked improvement and a desire on the part of many to "play the game."

When we had finally gained their confidence they would bring their difficulties, professional and not infrequently private, for advice or assistance.

I have had several interviews with his Excellency the Prefect, which, when one comes to look back on them now, were somewhat amusing. These interviews were usually with the object of keeping the peace between the Prefect and the director of the street cleaning department. After the usual coffee and cigarettes and considerable talk about various matters having nothing to do with the subject, I would say that I had reason to believe that things were not going quite smoothly and efficiently, and that I could not have my work interfered with. Later, we always parted, outwardly at least, on the best of terms, and all went well again for a bit. But when it came to a question of, for example, a threatened strike of workers, it was necessary to appeal immediately to the General Officer Commanding-in-Chief.

With an organization and staff such as the above, it will be apparent that one could only devote one's time to matters of general importance, and primarily such as affected the health and safety of the Allied Armies, giving any time after that to the more minor matters, such as visiting shops and restaurants.

**General Sanitary Conditions of the Town.**

For a city which is the capital of a nation professing to be civilized, the general sanitary arrangements are deplorable and antiquated. What should be one of the best-drained cities in Europe, is probably one of the worst, although it has every natural advantage in site, having the Golden Horn flowing through it, dividing Pera and Stamboul, and the Bosphorus separating the European and Asiatic shores.

The drainage system is crude and quite inadequate. There are many areas of the city with no drainage at all, just a series of soakage pits, always overflowing, so that one was continually the recipient of complaints from those living in the neighbourhood that their house and surroundings were insanitary. By bringing pressure to bear on the municipal authorities, conditions were temporarily put right, but had it not been for such pressure nothing would probably have been done for months, if then.

I have been in numerous houses in Constantinople where the sewers were completely broken, and fecal and sewage matter was pouring down the walls or percolating through them; in these cases one was called on
to judge whether the landlord or the tenant was to put things right. A
definite time was then given for repairs, and if they were not carried out to
time the Allied Police took the matter up. I may say that it was very
seldom necessary to call in police assistance, the threat as a rule being
sufficient.

In those cases where drains do exist, they are poor, and do not form a
drainage system at all in the European sense, consisting merely of brick or
earth channels covered with flagstones, or, occasionally of thin cement
pipes laid so near the surface that they are continually being broken into
by street traffic.

In none of the native houses, and only in some of the European
houses are the latrines "trapped," so that even in some of the best houses, on
entry, one is met by an intolerable odour, apparently not noticeable to the
inhabitants.

The streets, however, bad as the surface is, have been kept surprisingly
clean, in spite of the fact that the workers are usually two months or more
in arrears of pay, in consequence of which they have threatened to strike
on several occasions. When this has happened, the matter has immedi­
ately been represented to the General Officer Commanding-in-Chief, Allied
Forces, as mentioned before, who always took the most sympathetic view
of such a situation, and as a result of the pressure brought to bear by him
on the Turkish Authorities, the unfortunate workers received some of the
pay owing to them. But though it has always been a hand-to-mouth
existence, the results obtained in the circumstances have been most
gratifying.

WATER SUPPLY.

The water supply is derived from three sources and is inadequate
especially during the summer months:—

(1) The Derkos supply is derived from Lake Derkos, some twenty
miles distant from the town. It is owned by a French company, and although by
far the best supply, is contaminated and insufficient. During the summer
* Bacillus coli * was found present in 0.5 cubic centimetre. No filters are
employed, and the whole system requires thorough overhaul and renewal;
it has never recovered from the lack of attention during the war, and for
the moment the Company has no money to spend on it.

(2) The Evkaf supply originates in a series of artificial reservoirs in
Belgrade Forest, controlled by the Evkaf Ministry (Ministry of Pious
Foundations). In this case also the supply is unfiltered, and the whole
system, reservoirs and conduits alike, are in a deplorable state of disrepair.
Analysis of this water showed * B. coli* present in less than 0.5 cubic
centimetre.

In one area in Stamboul in the course of about one mile, there were
over sixty openings into the main conduit, through which all and sundry
drew their water by the simple method of dipping into the conduit. Here
again, no repairs have been carried out through lack of funds, although in
this case I was inclined to doubt the veracity of the statement, as the Evkaf Ministry is looked upon as one of the wealthiest and most influential in Turkey.

(3) Wells exist all over the town; the quality of the water from these may easily be imagined.

**Cholera.**

Although cholera has been either endemic or epidemic in South Russia throughout the year, not one case occurred in Constantinople, and I am convinced that this was entirely due to the control over those coming in exerted by the Maritime Commission. And although this caused a great deal of work for those concerned, and much inconvenience for maritime passengers, the result was nothing short of marvellous. Had cholera got a hold in Constantinople under the sanitary conditions described, there is no knowing how it would have ended.

The system adopted was to obtain a specimen of feces from each person arriving from an infected port. This was examined in the laboratory of the Maritime Administration. Up to the end of September, 11,179 such examinations had been carried out, with the result that seventeen cholera carriers and ten carriers of a non-agglutinating vibrio were isolated. As soon as this procedure had been carried out, and all on board, including the crew, had been inoculated, the passports were taken away from the passengers and they were given instead a slip ordering them to report daily for observation for five days at my office, after which time, if they had no symptoms, I returned their passports. Failure to comply with this order was punishable by the Allied Police.

As a rule the results of the examinations were available before the passengers had got down to Galata from Kavak, so that carriers were actually isolated in hospital before getting into town; in two or three instances, however, when this did not happen, it was merely a matter of a few hours until they were discovered.

In addition to these precautions affecting the town itself, it was my duty to ensure that no passengers travelled westwards until they had completed their observation period or had been pronounced as non-infective. This often gave rise to difficult incidents. For example, if the American, Swedish, Danish, or some other legation not of the Allies demanded the passport of one of their nationals, in order that he or she might leave Constantinople, it was necessary to explain, often at some length, why such restrictions were imposed, and that really the liberty of the subject was not being seriously interfered with, etc. On the whole I must say that with give and take on both sides, everything passed off amicably.

In addition to the cholera carriers referred to above, twenty-three cases of cholera were actually removed from ships at Kavak.

It is worthy of mention that those passengers from whom the non-agglutinating vibrio were isolated all came from places where cholera was actually epidemic.
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Up till September 30, 18,018 cholera inoculations had been carried out at Kavak; during the same period 4,518 inoculations were performed in the town amongst people working in the docks and on the Golden Horn.

Plague.

There have been only twenty-nine cases of plague, with ten deaths during the past year; this low incidence is I think very satisfactory, considering the geographical situation of Constantinople, forming as it does one of the most important gateways on the world's international commercial highways, with ships continually arriving from east and west, and from ports where plague is endemic.

The only fact worthy of mention with reference to plague is that, as in previous years, no infected rats have been found, although upwards of 200 have been examined. This is somewhat difficult to account for, and the only explanation I can offer is, that the local population, always strong believers in fate, consider that with so few cases their chances of getting the disease are very remote. If they do get it, it is "kismet," and therefore comes in the natural course of events. Consequently, if a dead rat is found which might prove positive, it is hurriedly hidden out of the way in order that they may escape the inconvenience and restrictions of vigorous quarantine and disinfection measures.

I am absolutely convinced, however, that plague is endemic amongst the rats in one or two areas, as although there have been only sporadic cases, the majority of them, all of which were bubonic, have occurred in two well circumscribed areas. No cases occurred on the Asiatic side, although in 1920 there was an outbreak at Haidar Pasha amongst repatriated prisoners of war in the Selimlieh barracks. This is the largest building of its kind in the world, and capable of housing, according to the Turks, 20,000 troops. In this case infected rats were actually found.

During the year 107,676 inoculations against plague were carried out.

Typhus.

At no time throughout the year did typhus assume any alarming proportions, the average being 4·5 cases per week, and the maximum in any one week being twenty-two. Considering the overcrowded condition of the town, teeming as it was with refugees in a semi-starving and filthy condition, this must be considered as satisfactory.

The following are the figures for this disease during the past seven years:

<table>
<thead>
<tr>
<th>Year</th>
<th>Constantinople</th>
<th>Provinces</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Cases</td>
<td>Deaths</td>
</tr>
<tr>
<td>1916</td>
<td>1,384</td>
<td>198</td>
</tr>
<tr>
<td>1917</td>
<td>7,384</td>
<td>791</td>
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<tr>
<td>1918</td>
<td>5,580</td>
<td>938</td>
</tr>
<tr>
<td>1919</td>
<td>665</td>
<td>331</td>
</tr>
<tr>
<td>1920</td>
<td>379</td>
<td>16 (?)</td>
</tr>
<tr>
<td>1921</td>
<td>238</td>
<td>9</td>
</tr>
</tbody>
</table>
The inferences to be drawn from these figures are interesting. I understand that during the war the German Medical Authorities interested themselves largely in this question, in fact, the only really good baths in Constantinople were the result of German enterprise. They certainly appear to emphasize the apparent helplessness of the Turkish authorities to cope with anything like an epidemic, especially in war time. The figures for the provinces must represent a large number of military cases, and doubtless in the Army bathing facilities did not exist.

Relapsing Fever.

Only sixty-eight cases occurred during the year under review; from the figures shown below it will be seen that this is a large decrease when compared with previous years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Cases</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1,643</td>
<td>331</td>
</tr>
<tr>
<td>1920</td>
<td>665</td>
<td>30</td>
</tr>
<tr>
<td>1921</td>
<td>573</td>
<td>16</td>
</tr>
<tr>
<td>1922</td>
<td>68</td>
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</table>

Smallpox.

This disease is, and always has been, endemic with periods of epidemicity. During the year there was a total of 704 cases, of which 342 occurred in the last month. Vaccination is compulsory and gratuitous in Turkey, but nevertheless there is a very high percentage of unvaccinated persons. The ignorance of the populace on the question of smallpox is surprising, and I am credibly informed that many, after compulsory vaccination, deliberately go home and wash the lymph off in order to ensure that they will not be inconvenienced by “taking.”

The epidemic in December, which still continues, was due to the influx of refugees from Anatolia and the Black Sea area consequent on the Turkish victories in Asia Minor. However bad the standard of vaccination is in Constantinople it is certainly much lower in the interior. Not only was there the influx of an unvaccinated population into the city where the disease was endemic, but numerous cases were brought in with them, either in the early stages of the actual disease, or more frequently during the incubation period. Compulsory vaccination before landing in the city was made obligatory for all, and now I am glad to say that although there are still far too many cases, it begins to look as if the epidemic was being got in hand.

Over 350,000 persons were vaccinated during the year. There is a really good lymph institute in Constantinople capable of producing a practically unlimited supply of calf lymph, from which I have obtained a considerable amount for the Army and Navy at various times.

Enteric Group of Fevers.

Constantinople is handicapped through lack of modern drainage, and with a heavily contaminated water supply enteric fever is endemic in
the city as it is throughout Turkey. During the months of July, August, September and October it assumed alarming proportions and caused considerable anxiety. One thousand and eighty-nine cases were notified during the year; I use the word notified as I am convinced that there were many more cases which were never heard of. Of these 1,089 cases, 840 occurred during the four months mentioned above.

Everything possible was done to combat the epidemic. The general public were warned against the danger of drinking impure water, of eating uncooked vegetables and fruit unless thoroughly washed and so on. Inoculation was pushed as far as possible, 86,154 persons being protected.

Use was made of this epidemic to try and improve the water supplies, but without success. I called on the Evkaf Minister, and although we had a long discussion over the inevitable coffee and cigarettes, nothing was ever done, lack of funds being the excuse given. His intentions were apparently excellent, for he informed me that by an extraordinary coincidence it appeared that for some time he had had a project in view which closely coincided with the suggestions for improvement which I put forward. However, we had to be content with his good intentions, and meanwhile typhoid kept on increasing.

A significant fact which threw considerable light on the inefficiency of this Ministry was that there appeared to be no one, engineer or other person, who knew anything about the water supply, and I had to call in a municipal engineer in order to have a survey of it made; this, of course, was really a highly irregular proceeding, as previously none of the municipal staff had ever dared approach such an important body as the Evkaf, nor did that body ever brook any interference or control from the Service de Santé Publique Ottomane.

TUBERCULOSIS.

Owing to the misery and privations caused by the Great War, this disease, always one of the scourges of Turkey, gained a still stronger hold. In Constantinople alone, it was responsible for some 2,800 deaths in each year before the war, the figures rising to approximately 3,500 throughout the course of the war. There has been some improvement since, and last year the total mortality for the town was 2,231. There is a much higher incidence amongst women than amongst men, due to the unhealthy, indoor, and secluded life which they are forced to lead.

The unhygienic houses, in which open windows are unknown, and which are mostly heated during the cold weather with "mangals" (charcoal pans), the defective nutrition, the lack of healthy exercise, and the absence of any sort of sanatorium or institute for its treatment, are all predisposing factors in the dissemination of this malady.

Until the population learn something of the ordinary rules of health, there is not likely to be any very marked decrease in the incidence of disease.
VENEREAL DISEASE.

Probably in no other city in the world are the morals so lax, or is prostitution practised to so great an extent, both openly and clandestinely, as in Constantinople.

The Turkish laws on prostitution are excellent on paper, but are not carried out. According to law all prostitutes must register with the police, giving their address. They are then given an identity card, and are supposed to report weekly to the nearest dispensary for examination, after which examination the card is marked "clean" or otherwise. Should a woman be proved to be suffering from venereal disease she is immediately sent to the Venereal Hospital.

There are approximately 2,500 registered prostitutes in Constantinople, but this number represents only a fraction of the total; various estimates put the real number at about 20,000 which, in my opinion, is much more nearly correct.

The term "rabbit warren" best describes the brothel area in Galata. Here are found the lowest types of women of all nations, who grant their favours indiscriminately to the lowest dregs of the local population or anyone else who comes along for so low a sum as ten piastres (about threepence).

From the above description it will be evident why venereal disease, together with malaria and tubercle (as mentioned above), are known as the three scourges of Turkey.

Venereal disease is not, by any means confined to the town, it is rampant also in the country districts.

The Turkish authorities state that venereal disease, especially syphilis, was imported into Turkey after the Turko-Russian war. It doubtless increased from this time, but it certainly originated much earlier.

In the summer of 1920, the venereal hospital for women was burnt down, and temporary accommodation for their treatment was not found until about August, 1921. I remember visiting this temporary hospital in September, 1921, and a more inefficient institution I have never seen. Method and system there was none. All the equipment had been burnt in the fire at the hospital, and there was no money to replace it. The lavage room was more like one of Heath Robinson's humorous sketches than anything else. Picture a large room with from seventy to 100 women, all chattering like monkeys, with three tables on which three doctors carried out treatment and examinations, while all present looked on. At one end of the room imagine two ordinary wooden tables, each with a patient receiving lavage from two Turkish nurses. Placed just behind these two was a third table, on which was erected a crude wooden framework; on top of this was a large douche can. A chair was also perched on this third table, and standing on this chair was a little nigger girl with black fuzzy hair tied with a brilliant red bow, solemnly ladling potassium permanganate solution with a soup ladle out of a bucket into the douche can.
Such was the lavage room, and the rest of the hospital was on the same standard; in spite of the seriousness of it all, it was extremely difficult not to smile.

Venereal disease had always caused a serious wastage in the Allied Armies, and in September, 1921, the General Officer Commanding-in-Chief, Allied Forces of Occupation, called a meeting of the Allied Generals, and appointed a Committee known as the Commission Interalliée de Prophylaxie Anti-Vénérienne under the Presidency of Le Médecin Principal de Première Classe Dejouany, who was the French Director of Medical Services.

On this Committee the British representatives were the Interallied Sanitary Commissioner, the Assistant Provost-Marshal, and an officer of the Allied Police. An intensive campaign against moral offences was inaugurated. All women found soliciting, who were unregistered, or who gave venereal disease to Allied soldiers, were vigorously harried and punished. When women were arrested for such offences they were sent, in the first instance, to the Turkish dispensary for examination. If infected, they were punished and sent to hospital: if clean, they were fined, and if unable to pay a fine, were imprisoned. Over 750 such cases were dealt with by the Allied Police during 1922; the majority being from the Pera sector of the city. A separate account was opened for the money received in the shape of fines for these offences.

The Committee also interested itself in the question of providing a venereal hospital for women, with the result that a building which had been occupied by the Indian General Hospital was handed over to the Turkish Medical Authorities for the purpose. The Allied Armies equipped this hospital, and it was placed under the control of the Sanitary Commissioner with a Turkish staff.

Soon there was a really good hospital functioning, with discipline amongst the patients and a standard of cleanliness never before obtained. In one block there was a prison where those under sentence, or who broke hospital rules, were confined. In spite of our supervision, however, I realized when I took over the appointment of Allied Sanitary Commissioner in June, 1922, that the chief doctor was not all that he ought to be; in fact, there was strong reason to believe that he was accepting bribes to release patients before they were cured. Also it was almost certain that some of the more attractive women were being kept in hospital after being cured, for the amusement of the staff. In consequence of this, I had the doctor in charge replaced by another from the Venereal Disease Department who had worked for some years in Paris. Since that time the hospital has improved beyond recognition, and is now one of the really efficient organizations in Constantinople. The doctors were paid twenty to twenty-five Turkish pounds per month from the Allied Venereal Account in addition to the inadequate salary which they received from the Turkish Government; this was very much appreciated and made them keen to work and contented.
Previous to July, 1922, all Wassermann reactions and other examinations were carried out at the Government Bacteriological Institute. This was extremely inconvenient, so a laboratory, where all the bacteriological work of the hospital could be carried out, was established within the building.

The standard of cure laid down was three negative smears at intervals of two days for gonorrhoea cases before they were sent to the chief doctor for discharge. Patients sent up for discharge were seen twice a week by him, and it was the routine procedure for him personally to take a further slide from each case. Each patient was given a number on admission, and at the time when the last slide was taken, the number only and not the name was entered on it. All final slides were then examined, and if negative, the patients were discharged.

After discharge from hospital, women not already registered were given their registration cards by the police, and all were supervised weekly in the dispensaries outside, of which there are four, which it was my duty to visit. Some 3,500 women, including the following nationalities, Turks, Greeks, Armenians, Jews, Russians, Austrians, Roumanians, Serbians, Italians, French, Americans, were treated during the year 1922.

In March, 1922, on the suggestion of Colonel Dejouany, two allied "blue lamp" rooms, or as the French prefer to call them, cabines prophylactiques, were opened, one in Pera and one in Galata. A Russian medical student was placed in charge of each, and I consider that they did most useful work. In the Pera room alone there were 5,055 attendances by British soldiers out of a total of 9,872 of all nationalities.

The measures adopted in these rooms were the following: After thorough washing of the external genitals with warm water and medicated soap, the attendant instilled six or seven drops of a twenty per cent solution of argyrol in glycerine into the urethra, and afterwards rubbed in calomel cream on the glans and prepuce.

The formula for the argyrol solution was the following:

\[
\begin{align*}
\text{Glycerine} & \quad \ldots \quad 20 \text{ grammes} \\
\text{Distilled water} & \quad \ldots \quad 80 \ "
\end{align*}
\]

Argyrol was then added to make a solution of the strength of one gramme of argyrol to four grammes of the glycerine and distilled water.

**Malaria.**

Mosquitoes abound in Constantinople during the summer months, but as in the town they are all of the culex variety, there is no primary malaria in the city itself. In the surrounding districts, however, anopheline mosquitoes are found.

Throughout Turkey the rural population suffers heavily from malaria, and practically the only regions exempt are the higher plateaux in Asia Minor, but even these are not all entirely free. Lakes Ilghim and Bey-Chehir in the Vilayet of Konia all harbour mosquitoes, in what was other-
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wise an immune area. Because of a badly planned irrigation scheme for the plain, Konia itself, which previously was free from malaria, is now a hotbed of the disease.

All the coast of Asia Minor in the proximity of rivers is more or less infected. The regions which suffer most are the villages of Bafra, Tarmeh, and Tchorchamba at the mouth of the river Kizil-Irmak on the Black Sea littoral, where the splenic index figure amongst the inhabitants rises as high as eighty per cent.

On the coast of the Sea of Marmora, Ismid and its surroundings, and the regions of lakes Sabandja and Iznik, are all heavily infected.

On the coast of the Ægean Sea, the mouths and tributaries of the rivers Ghediz and Meandre, and on the Mediterranean coast the rivers Seihan and Djeihan, all form a source of infection for the local population.

Refugees.

The enormous numbers of refugees who have arrived in Constantinople during the past three years have been a serious menace to the public health of the city. They have added further complications to an already difficult situation.

The first influx of Russian refugees occurred in March, 1919, after the downfall of General Denekin. The greatest invasion, however, took place in October and November of the next year, consequent on the defeat of General Wrangel's army, and the evacuation of the Crimea. Various estimates put the number of arrivals during these months at approximately 360,000.

So great were their numbers that it was quite impossible for the lazarets of the Ottoman Maritime Sanitary Administration to deal with them. These unfortunate people were therefore transferred to camps in Gallipoli and in the neighbourhood of Constantinople, practically as they arrived. In spite of all efforts to prevent it, thousands also landed in the town, or found their way thither from the camps or from the islands.

Sleeping where they could find any shelter, this vagrant population, badly clothed and unwashed, scattered vermin—often infected—to the danger of the public.

The Greek offensive in Asia Minor in the spring of 1921 caused refugees from Anatolia, both Greek and Turkish, but chiefly the latter, to seek refuge in Constantinople, thus adding a further 65,000 to an already overcrowded city. In February, 1922, about 20,000 Armenians fled from Galicia. These also came to Constantinople.

During the later months of 1922, as the result of the Turkish victories in Anatolia, there was a further influx of refugees whose numbers must have reached 100,000. These were responsible for the smallpox epidemic, which still continues.

From the above description, the continual struggle which the Allied Sanitary Commission has had to combat epidemic diseases will be easily
understood. It also explains the large number of typhus and relapsing fever cases in 1920 and 1921. The plight of the refugees who were not permitted to land was even worse. I remember a ship of about 1,500 tons, which passed through the Straits on her way to Greece from South Russia. This ship had on board 4,500 Greek refugees (her normal complement of passengers would be about sixty). Twenty-seven cases of relapsing fever, 2 of smallpox, 7 of cholera, besides many other serious cases of non-infectious diseases, bringing the total up to 88, were landed at Kavak. While she was lying in the Bosphorus, forty-one deaths occurred, and I am informed that before she finally disembarked at a Greek island, there were more than 800 deaths on board her. These were voluntary refugees, who had paid the owners of the ship the sum of L.T. 12 passage money. In the interests of humanity, I represented the case to the British Captain of the Port, and requested him to take any possible steps to stop this overcrowding of ships. He inflicted a fine of £300 sterling on the owners by way of deterrent, but this, I am afraid, was easily paid out of the profits of the voyage.

**ANTI-RABIES INSTITUTE.**

This is one of the most important institutes in Turkey. Rabies is endemic amongst the wolves and jackals throughout the country, causing frequent sporadic outbreaks amongst the dogs.

No licensing laws for dogs are enforced in Turkey. It is against the Koran to take life unnecessarily, and as the Turk does not see any necessity for destroying dogs they multiply exceedingly. Some years before the War there was a rabies scare, and thousands of dogs were deported to an island in the Marmora, where they had neither food nor water, and where they devoured one another, or died slowly of starvation or thirst. This did not constitute killing, and was therefore defensible.

During the months of May, June and July last year there was an outbreak of rabies in Constantinople. It was first brought to notice when a Turkish policeman, who had been bitten by a dog a month before, was brought to the institute suffering from hydrophobia. He died within thirty-six hours. After this the Allied police, on the recommendation of the Sanitary Commission, instituted an intensive campaign against stray dogs, and the municipal employees also assisted. It is estimated that between 8,000 and 9,000 dogs were destroyed in the city during these months.

The Anti-Rabies Institute has worked under great difficulties through lack of funds. I felt anything but comfortable on the first occasion I entered a large shed where about eighty to ninety dogs were under observation. There was no money with which to purchase chains, and they were tied with pieces of string or anything available. Three broke away whilst we were in the building, and I was very glad to go out again and to allow an attendant to lead out a rabid animal which I wished to see.
The Inter-Allied Sanitary Commissions in Turkey

During the year 1922 three British officers, two other ranks and one naval rating were treated at the Institute.

From November 1, 1921, to November 1, 1922, 1,709 persons came to the institute, of whom 899 were actually treated. Treatment for the other 810 was not considered necessary.

Of the 899, 347 were treated by the original Pasteur method and 552 by Hogyes method.

The great majority of the cases came for treatment within fifteen days of being bitten, as is seen from the following figures:

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Number of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 days</td>
<td>417</td>
</tr>
<tr>
<td>6-10 days</td>
<td>251</td>
</tr>
<tr>
<td>11-15 days</td>
<td>95</td>
</tr>
<tr>
<td>16-20 days</td>
<td>68</td>
</tr>
<tr>
<td>21-25 days</td>
<td>34</td>
</tr>
<tr>
<td>26-30 days</td>
<td>12</td>
</tr>
<tr>
<td>31 days and over</td>
<td>22</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>899</strong></td>
</tr>
</tbody>
</table>

Four hundred and thirty-seven of these people were bitten on the upper limbs, 397 on the lower limbs, 45 on the face, and the remainder on the body.

All sorts of animals were responsible for the bites as shown in the following table:

<table>
<thead>
<tr>
<th>Animal</th>
<th>Number of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dogs</td>
<td>767</td>
</tr>
<tr>
<td>Cats</td>
<td>70</td>
</tr>
<tr>
<td>Wolves</td>
<td>9</td>
</tr>
<tr>
<td>Horses</td>
<td>1</td>
</tr>
<tr>
<td>Rabbits</td>
<td>2</td>
</tr>
<tr>
<td>Men</td>
<td>5</td>
</tr>
<tr>
<td>Monkeys</td>
<td>4</td>
</tr>
<tr>
<td>Donkeys</td>
<td>2</td>
</tr>
<tr>
<td>Sheep</td>
<td>1</td>
</tr>
<tr>
<td>Rats</td>
<td>25</td>
</tr>
<tr>
<td>Fowls</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>899</strong></td>
</tr>
</tbody>
</table>

The director of the institute lays stress on the fact that all authorities appear to agree that although birds can be inoculated with rabies, they never show any clinical symptoms. He illustrates this by the case of a child who was bitten on the face by a cock and who was brought to him by the parents who wished to know whether or not treatment was necessary. He inoculated a rabbit from the brain of the bird and the rabbit died of rabies on the ninth day.

Of the 899 cases treated 130 had been bitten by animals certified as rabid by a doctor or veterinary surgeon. In 258 cases, from the history given, there was strong reason to suspect rabies; in the remaining 511 cases the animal was merely suspect on account of the disease being existent.

About 700 of the cases were from Constantinople, the others were from as great a distance as Samsoun, Trebizond and Eskicheir. The greatest number treated in any one month was 272 in June.
In considering the results of treatment for statistical purposes, the following three periods are recognized:

1. The actual period of treatment.
2. The fifteen days following the last inoculation.
3. Any time later than fifteen days after the end of treatment.

Only those cases who die in period (3) are looked upon as having been unsuccessfully treated. It is contended that full immunity is not acquired until the period (2) is over.

Eleven deaths occurred amongst the 899 cases treated. Of these, four arrived at the Institute with symptoms of rabies, four developed the disease during period (1), and three cases died of diseases other than rabies.

The average time elapsing between the bite and the development of rabies in three cases who were brought to the Institute with symptoms of the disease was 35.6 days. No history was obtainable in the fourth case.

The following particulars of the four cases who died during treatment are interesting, as they show how quickly rabies can supervene as the result of bites in the region of the head or upper extremities.

<table>
<thead>
<tr>
<th>Case</th>
<th>Age</th>
<th>Animal responsible</th>
<th>Region bitten</th>
<th>Number of bites</th>
<th>Number of days between bite and treatment</th>
<th>Commencement of the disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9 years</td>
<td>Dog</td>
<td>Right eye, nose, upper lip</td>
<td>5</td>
<td>16</td>
<td>13th day of treatment</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>Wolf</td>
<td>Forehead, left cheek</td>
<td>4 deep</td>
<td>12</td>
<td>16th</td>
</tr>
<tr>
<td>3</td>
<td>67</td>
<td>Wolf</td>
<td>Forehead</td>
<td>2</td>
<td>5</td>
<td>16th</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>Dog</td>
<td>Left forearm with laceration of the nerves</td>
<td>3</td>
<td>6</td>
<td>14th</td>
</tr>
</tbody>
</table>

In considering the necessity or otherwise of treatment, the following rules were adhered to:

1. If the animal died, was killed, or disappeared within twelve days of biting. Treatment indicated.
2. If the animal was unknown. Treatment indicated.
3. If the animal became ill but did not die during the observation period; observation was prolonged.
4. If the animal was quite well and normal at the end of twelve days there was no hesitation in deciding that treatment was unnecessary.
5. The absence of Negri bodies in the hippocampus major of an animal which had been killed instead of being placed under observation, was never taken as sufficient evidence on which to state that the animal in question had not been rabid. In such a case a rabbit was inoculated from the brain of the animal, and on the result of this a decision was based.