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THE CHOLERA IN HAMBURG IN 1892.

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THE most striking feature of the recent epidemic of cholera at Hamburg—the fifteenth from which the city has suffered since 1831—was its sudden, explosive beginning. There were not, as in previous epidemics, at first isolated cases of severe gastro-enteritis, to afford an opportunity of testing the resources of modern hygienic investigation in the recognition of the disease, the isolation of the patients, and the adoption of preventive and protective measures. Physicians, officials, and the community were first alarmed when a large number of cases appeared simultaneously in many widely-separated parts of the city. In this epidemic, in contrast with previous visitations, the low-lying districts of the harbor were not alone at first attacked.

To-day evidence is yet wanting as to the source of the first case. The manner in which the disease virus was introduced and the time at which the introduction occurred are still unknown. The city enters into commercial relations with all parts of the world. That the germ was not brought by way of the mainland would seem to be demonstrated by the fact that no cases occurred in any place situated between Hamburg and the two nearest countries in which cholera at the time prevailed, *i. e.*, France and Russia, before the outbreak of the epidemic in Hamburg

itself. Isolated cases that subsequently appeared in various parts of Germany, but which in no instance furnished the starting-point of an epidemic, could be traced to refugees from Hamburg. Whether the germ of the disease was brought by ships from Havre or from the Black Sea is not known; general opinion, however, inclines to the latter-named source, and in particular to Baku, whence the scourge had from the early part of June pursued its way northwestward over Russia to St. Petersburg. The suspicion, at first largely entertained, that Russian emigrants, of whom there were at the time large numbers passing through the city on their way to England and America, acted as carriers of the disease, was found to be entirely unsupported.

Although the portal of entry of the disease remains unknown, there is substantial evidence in explanation of its peculiar mode of extension. The simultaneous invasion at the beginning of the epidemic of parts of the city widely separated from one another, but especially the limitation of the epidemic within comparatively sharp lines, separating Hamburg from the neighboring cities of Waldek and Altona, which were exposed to the same conditions of air, and probably, also, of soil, but each of which has its own separate water supply, leads to the inference that the common water supply of the city is to be looked upon as the principal channel of dissemination of the germs of the disease.

The city receives its supply of water, unfiltered, directly from the river Elbe, at a point just above its extensive harbor. The danger implied by this fact becomes the greater when it is added that the sewage of the densely populated city is poured into this stream, and that the ebb and flow of the North Sea are perceptible at the source of supply. Waldek receives its drinking-water from an inland sea, while Altona derives its supply from the Elbe below Hamburg, but subjects it to a process of purification by a method of sand-filtration that has been in operation for many years. The water supply of Hamburg has thus been entirely inadequate and in the highest degree dangerous, furnishing conditions the most favorable for the existence of vegetable and animal life,¹ while the interior of the water-distributing pipes is lined with a heavy deposit of organic matter. An additional factor favorable to the development of the disease germs, *i. e.*, the comma bacilli, assuming their presence and constant renewal in the pipes of the water supply, is the existence of reservoirs with which, by municipal decree, all houses must be provided, as a precaution in case of fire, in order to equalize variations in pressure in the water supply and to facilitate a uniform distribution of the water from a central source. The reservoirs were often cleansed but carelessly and sometimes not at

¹ K. Kraepelin: "Die Fauna der Hamburger Wasserleitung," Abhandlungen des Naturwissenschaftlichen Vereins in Hamburg, ix. 1.

all, and the slimy deposit that formed at the bottom furnished a most favorable soil for the development of microorganisms of all kinds. Too much reliance was placed upon filtration of the water, which was practised in most households, even among the poorer class.

In the disposition to the occurrence of local epidemics thus created, those that seek in the water supply alone the conditions for the propagation of the disease would find the most important factor in explanation of the invasion of certain stories and certain houses of the same street, with the escape of others. It goes without saying that other influences, such as an irregular mode of living, lack of cleanliness, a failure to carry out the preventive and protective measures recommended, as well as crowding amid unfavorable hygienic conditions, entered into the determination of an attack. These must be considered in every epidemic in every city, and do not apply, as do the other factors, specifically to Hamburg. One other point must not escape mention, and that is the large number of crooked, dirty, densely populated streets peculiar to Hamburg.

All attempts to demonstrate unequivocally, by plating methods, the presence of comma bacilli in the water of either the general supply or the house reservoirs failed. This fact cannot be urged as an argument against the spread of the disease by way of the water supply, in view of the difficulty of detecting cholera bacilli in water. It seems to have been by a peculiar and unfortunate chain of circumstances that the disease germ found its way into the city just at a time at which the splendid new water-works that have for a number of years been in process of construction are approaching completion, which will in future provide water clarified and purified by a process of sand-filtration, and will at the same time permit the source of supply to be transferred to a point higher up the stream.

The extent to which those conditions of timely and local disposition, to which so much importance has been attached as a result of the epidemiologic studies of Pettenkofer, enter into the etiology of this severe and sudden epidemic cannot yet be determined. Conjecture is here given greatest rein, especially as the actual date of the first infection remains unknown, and also, in consequence, the length of time during which the virus remained latent or its presence was unattended with evil.

Mild attacks of diarrhœa, differing in no respects from the attacks of summer diarrhœa commonly observed every year, were of frequent occurrence in the weeks preceding the outbreak of the epidemic. As a matter of fact, during this time meteorologic conditions prevailed that, according to all previous experience, were most favorable to the spread of cholera, and that besides were extremely rare at and in the neighborhood of Hamburg. The weather of Hamburg, lying as the city does

between the North Sea and the East Sea, is generally variable, damp, and, even in midsummer, is seldom very hot; but in the second half of August, 1892, the weather for several days in succession was extremely sultry, with a clear sky and mild southerly and westerly winds. The few thunderstorms that occurred brought no relief. Between August 17th and 24th the temperature rose almost daily above 87.8° F. In conjunction with these conditions the water in the Elbe sank to a low level, and the ground-water level also fell. During the preceding months the precipitation had been unusually slight.

In consequence of the heat—perhaps, also, as a result of the presence at this time of an unusual proportion of salt in the water of the Elbe and in the drinking-water—many forms of animal life present in the water-pipes succumbed (Dr. Ahlhorst); the otherwise sessile bryozoa were detached in large numbers, and, dying, furnished a favorable soil for the multiplication of germs of all kinds. A permanent decline in the temperature took place in the last days of August.

To what extent, in addition to the factors already considered, local disposition entered into the invasion of individual portions of the city will be discussed more fully later on. The conditions at Hamburg are not encouraging to a study of this kind; the city lies in part upon high, dry soil, and in part upon damp, marshy land. No final conclusion is to be based upon the fact that the proportionately larger number of cases occurred within the latter-named area, as it is largely populated by the poorer portion of the community.

Turning now to the course of the epidemic, it will be seen that the number of cases pursues a rapidly ascending line, with a moderately sharp decline, the highest point being reached on August 27th. Early in November three more cases were reported.

The population of the city may be estimated at 600,000 inhabitants. In the table 85 cases are recorded as having occurred before August 21st; these probably all occurred after August 15th.

It devolved upon the hospitals to make the diagnosis. A case admitted to the New General Hospital on the evening of August 16th, with pronounced symptoms of cholera, died on August 17th, and a post-mortem examination was made on August 18th. Immediate examination of the intestinal contents failed to afford positive evidence. This was, however, furnished subsequently by the plating process. In the second case, also admitted to the New General Hospital, and in which the post-mortem examination was made on August 22d, Dr. Eugene Fraenkel was able in the course of the autopsy, from an examination of the intestinal contents, to make an unequivocal diagnosis of Asiatic cholera. The diagnosis had been made with equal certainty in the Old General Hospital on August 21st, and in the course of the same day a considerable number of cases were admitted to this institution.

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	Cases.	Deaths.		Cases.	Deaths.
Up to August 20 . . .	85	30	September 25 . . .	95	39
August 21 . . .	83	22	" 20 . . .	77	33
" 22 . . .	200	70	" 27 . . .	82	33
" 23 . . .	272	111	" 28 . . .	75	23
" 24 . . .	365	114	" 29 . . .	49	20
" 25 . . .	671	192	" 30 . . .	58	10
" 26 . . .	995	317	October 1 . . .	36	10
" 27 . . .	1102	455	Sixth week . . .	472	180
First week . . .	3773	1317	October 2 . . .	33	9
August 28 . . .	1028	428	" 3 . . .	39	7
" 29 . . .	980	393	" 4 . . .	30	12
" 30 . . .	1081	484	" 5 . . .	21	0
" 31 . . .	857	395	" 6 . . .	20	4
September 1 . . .	842	394	" 7 . . .	13	4
" 2 . . .	810	479	" 8 . . .	14	4
" 3 . . .	760	440	Seventh week . . .	170	46
Second week . . .	6378	3013	October 9 . . .	11	0
September 4 . . .	679	293	" 10 . . .	8	1
" 5 . . .	580	262	" 11 . . .	14	1
" 6 . . .	490	238	" 12 . . .	8	0
" 7 . . .	422	225	" 13 . . .	12	1
" 8 . . .	250	157	" 14 . . .	12	0
" 9 . . .	402	155	" 15 . . .	0	4
" 10 . . .	439	178	Eighth week . . .	71	25
Third week . . .	3362	1548	October 16 . . .	5	1
September 11 . . .	354	150	" 17 . . .	6	2
" 12 . . .	384	142	" 18 . . .	3	1
" 13 . . .	293	129	" 19 . . .	3	...
" 14 . . .	313	103	" 20 . . .	1	3
" 15 . . .	314	141	" 21 . . .	3	...
" 16 . . .	397	141	" 22 . . .	3	...
" 17 . . .	338	117	Ninth week . . .	24	7
Fourth week . . .	2393	923	October 23 . . .	2	2
September 18 . . .	222	110	" 24 . . .	...	...
" 19 . . .	254	110	" 25 . . .	...	1
" 20 . . .	217	87	" 26 . . .	...	...
" 21 . . .	198	79	" 27 . . .	...	1
" 22 . . .	172	55	" 28 . . .	...	...
" 23 . . .	158	67	" 29 . . .	...	...
" 24 . . .	126	39	Tenth week . . .	2	4
Fifth week . . .	1327	547	Totals . . .	17,972	7610

The municipal authorities were apprised of the facts on August 22d; on August 23d a proclamation was issued to the people, together with information as to the means of protection and prevention to be adopted;

n short time later the schools and the river-baths were closed, and careful supervision of railway intercourse was instituted. Life in the harbor languished.

Both the New General Hospital and the Old General Hospital at once made provision for the reception of patients. The New General Hospital is situated in the suburbs of the city, having been erected a few years ago upon the pavilion system. It is well equipped, and generally accommodates 1600 patients. The Old General Hospital is a large building, constructed upon the corridor system, and possesses even a larger number of beds than the New General Hospital. Behind the New General Hospital stood six barracks, each provided with twenty beds, and its own commissary service and drug-store, in anticipation of an epidemic. These beds were rapidly filled, and additional room had soon to be secured. Convalescents were dismissed from the hospitals; those most ill were crowded into a few pavilions or wards; several small hospitals in the city and a number of dwellings rented for the purpose were prepared for the reception of patients not suffering with cholera.

Throughout the entire epidemic, notwithstanding the great demands made in the course of a few days upon the administrative and executive officers, upon the commissary department and upon the physicians, not a single patient was refused admission to the hospitals on account of want of room; and at no time was there any real difficulty in making provision for all that were admitted. Up to August 28, 29, and 30, when the tide of the epidemic began to ebb, it was not all times possible to find new room, to furnish clean beds and fresh linen, and with the aid of faithful assistants to provide well and promptly for patients, and to insure cleanliness and good and efficient nursing. Minor obstacles that occasionally arose were not worthy of consideration. By way of illustration: on September 2 there were in the Old General Hospital 1062 cases, and in the New General Hospital 1024.

Not before the first of September were barracks erected in various parts of the city: in the gardens about the Old General Hospital; in the harbor in connection with the Seamen's Hospital; and in the eastern and western parts of the city. On August 30th a schoolhouse, prepared in the course of twenty-four hours for the reception of 80 patients, was opened in the southeastern part of the city and placed under my charge. A field-hospital, with a capacity of 500 beds, furnished by the Minister of War, was erected adjacent to the New General Hospital, and close to this, on September 15, a barracks with a capacity of 250 beds was additionally provided. Physicians, nurses, and assistants had come from all parts of the German Empire with proffers of aid.

The ambulance service was somewhat more tardy in systematic organization. It was necessary to transport patients to the hospitals simultaneously from all parts of the city, at the remotest distances.

Notwithstanding the large number of conveyances impressed into this service, some little difficulty was at first experienced on account of the enormous number requiring transportation. The common transportation at one time of several cases of varying degrees of intensity was a not infrequent occurrence in the first few weeks of the epidemic. The system of transportation was directed from a central station, for only thus could it have been possible to direct the stream of patients to the one or the other of the two receiving hospitals, so that the other might meanwhile be afforded a few hours for rest, recuperation, and renewed preparation.

Sanitary stations were established in twenty different portions of the city, and in these were placed physicians whose duty it was to furnish first aid. Each station was provided with a disinfecting oven, by means of which wearing apparel, linen, and bed-clothing were sterilized in a current of steam. From these stations persons were deputed to visit the houses in which cases of cholera occurred, for the purpose of disinfecting the stools and the furniture, and to protect the remaining members of the family from infection. Disinfectants were gratuitously distributed among the people.

Burials took place directly from the hospitals or from provisional pavilions especially constructed for the purpose. Huge graves were dug in the Central Cemetery. In this connection there was some little difficulty at the height of the epidemic.

Among other measures adopted in the course of the epidemic was the sending through all the streets of wagons dispensing boiled or spring water; the boring of artesian wells; the cleaning of certain especially unhygienic quarters of the city; the organization of aid societies by the citizens, and the collection of moneys for the support of impoverished families.

The population maintained a praiseworthy calmness; readiness of aid and willingness of sacrifice characterized all classes.

As to the disease itself: a preponderance of severe cases at the beginning of the epidemic, with a moderation in severity as the mortality rate declined, was a marked feature of this epidemic, as it has been of previous extensive ones.

Two features characterized this epidemic in contrast with the majority of others: the absence of febrile temperature early in the attack and the conspicuously frequent absence of all prodromal symptoms, particularly the premonitory diarrhœa. Observations bearing upon the temperature were made in comparatively few cases; but neither I nor others, so far as I have been able to learn, observed in the algid stage greater differences between the temperature of the axilla and that of the rectum than are at all times present.

In the majority of cases, thus, the disease set in abruptly and at once assumed its full intensity, so that frequently, and particularly at the begin-

ning of the epidemic, profound collapse, with diarrhoea and cramps in the calves of the legs, speedily followed the initial vomiting. Cases of fulminant cholera sicca were common at this time. Individuals would be stricken upon the street, while at work, or during a meal.

The clinical picture presented by the disease did not differ from that presented in previous epidemics. A secondary febrile period, or so-called reaction, lasting from a few days to two weeks, appeared in the train of many cases of marked and of moderate severity, often without noteworthy disturbances of the general condition; but in a smaller proportion of cases, with more or less well-marked typhoid manifestations.

In isolated cases the spleen was found to be enlarged. In many cases of grave type the algid or asphyctic stage was followed by a profound and almost always lethal sopor, in many respects resembling the coma of uræmia, from which, however, it differed in the absence of all convulsive manifestations. In the cases under my observation the pupils were, under these circumstances, always contracted; œdema was absent; frequently there was marked restlessness; the pulse was tense and slow; the cheeks often presented a vivid blush. No changes were found in the few cases in which the eye-ground was examined (Dr. Moritz).

The urinary secretion was in part suppressed, in part represented by a fluid of low specific gravity and which had to be removed by means of the catheter. In the algid stage the anuria was typical; the resumption of the renal function constituted a good, though not absolutely favorable prognostic indication. The first urine passed contained for a short time albumin in varying proportion, together with hyaline tube-casts, epithelial cells, colorless and isolated red blood-corpuscles. Persistent albuminuria, with other symptoms of chronic nephritis, was extremely rare; it was present in none of the 376 cases under my care. Reducing substances were, however, sometimes present in the urine passed shortly after the algid stage.

Cutaneous eruptions were relatively common; they mostly resembled the exanthems of measles and urticaria, and were often attended with slight extravasations of blood, so that yellowish spots remained for several days after the disappearance of the eruption; only rarely were they distinctly hemorrhagic, taking the form of petechiæ. They appeared at variable periods in the course of the attack, involved trunk and extremities and were attended with but little itching; their appearance was not associated with any elevation of temperature, and they furnished no prognostic indication.

The temperature likewise afforded no guide in prognosis. Recovery took place in some cases in which the temperature had fallen as low as 93° F.

The stools were flocculent, at times resembling rice-water, at other

times stained yellowish; in elderly persons in particular, admixture of blood was common.

Metrorrhagia was frequently observed in women; abortion or premature labor was common in pregnant women. Advanced pregnancy and chronic alcoholism were most unfavorable complications.

True fibrinous pneumonia was encountered but exceptionally, and then unattended with febrile movement. Lobular pneumonia was infrequent; as was also the association with enteric fever and with scarlatina. Diphtheric and septic complications were likewise uncommon.

Full and careful statistics, in course of preparation by Professor Rumpf, Director of Hospitals, will shortly be published, and may be expected to illumine many of these associations and other interesting points.

From a therapeutic point of view the recent epidemic is remarkable for the fact that intravenous infusion was for the first time practised on a most extensive scale in many hundreds of cases, being not infrequently repeated a number of times in a single case. Besides this, subcutaneous infusion had warm advocates. Laadois's method of centripetal arterial infusion was practised alone by Dr. Schede. When it is considered that these various procedures were employed only in the severest cases, the estimated percentage of recoveries (25 per cent.) will appear a fair one.

A 0.6 per cent. solution of sodium chloride was the one most commonly employed; at times a 0.1 per cent. solution of hydrogen dioxide (Dr. Rumpf) was used; less commonly mild antiseptics, such as thymol (Dr. Heialeth), were added to the solutions; in a number of cases slow infusion was conjoined with sweat-baths (Dr. Zippel). The volume of fluid infused varied from two to four pints; the temperature preferably 104° F. Unpleasant complications were not encountered; inflammation at the site of puncture, as well as septic embolism, in consequence of imperfect sterilization of the solutions and apparatus employed, was extremely rare. The immediate result of the infusion was always striking, as a matter of course frequently of but brief duration; renewed vomiting and renewed diarrhoea being followed by a reproduction of the cyanosis, the pulselessness, the dry tongue and the vox cholericæ that had but disappeared.

Of other symptomatic measures hot baths proved efficacious in counteracting the cramps. Enteroclysis, by means of solutions of tannic acid after the method of Cantani, was in some cases attended with remarkable results.

Salol, which was universally used early in the epidemic, proved distinctly not of avail, given either by the mouth or injected beneath the skin in ethereal solution.

Calomel again earned much confidence for itself, and, given frequently

in minute doses (gr. $\frac{1}{80}$) or less frequently in larger doses (gr. jss.) often favorably modified the course of the disease.

The other intestinal antiseptics were all soon abandoned. Opium suffered a similar fate; given internally it seemed to do harm; in a small number of cases, given subcutaneously in aqueous solution in small doses, before the occurrence of collapse, it appeared to exert a favorable influence. For the vomiting, cocaine and chloroform, as well as irrigation of the stomach, were frequently employed, with satisfactory results.

When coma had developed (and its occurrence was not prevented by the infusions), all therapeutic measures, including sweat-baths, venesection, infusions, diuretics proved fruitless.

The treatment instituted in the rigid stage by Prof. E. Klebs, by means of subcutaneous injections of anticholerin, a metabolic product of bacterial activity like tuberculocidin, and obtained from pure cultures of cholera-bacilli, is worthy of mention, and encourages the hope of further progress upon the same lines. The injection was followed by an elevation of the temperature during the attack, and a subsequent secondary febrile stage failed to appear. The proportion of recoveries is not at all unfavorable, but the number of cases treated with anticholerin is entirely too small for reliable conclusions to be arrived at.

Of fluids, much coffee, tea, and weak hydrochloric acid lemonade were given; carbonated waters seemed to induce vomiting. Ice was well borne; so also was oatmeal gruel with red wine. Injections of oil of camphor were almost universally employed as a stimulant.

The total mortality in the New General Hospital exceeded 50 per cent. The number of cases received into the various hospitals may be estimated as greater than 8000.

What has been said in the preceding has been drawn largely from observations made in the New General Hospital and in the infirmary under my care. In the remarks that follow upon the anatomic features of the epidemic the experience of the New General Hospital will be detailed. In this hospital 516 post-mortem examinations were made by the prosector, Dr. Fraenkel, together with his assistant, Dr. Deycke; in many cases only the abdominal viscera were examined.

In all cases the renal lesions described in previous epidemics (Griesinger, Cohnheim, Klebs) were found. These consisted in destruction of the secreting epithelium, particularly in the convoluted tubules, appearing at first as an acute swelling, and later as a direct disintegration and destruction of the protoplasm, as a result of which, in contrast with the conditions present in cases of coagulation-necrosis, the nuclei were well preserved. Macroscopically, the enlarged kidney presented a characteristic reddish-brown tint. In no case were there evidences of a productive inflammation. These changes appeared as early as a

few hours after the onset of the disease; in cases in which the attack was farther advanced many casts were found in the lumen of the uriniferous tubules. In a not inconsiderable number of cases, but never before the end of the first week, extensive fatty degeneration of the parenchyma of the kidneys was found; the organs were large and yellow, the dark bluish-red medullary substance presenting a marked contrast to the yellow cortex. Microscopically the epithelium was found to be in a condition of profound fatty degeneration, with the presence of large oil-globules, and bearing the closest resemblance to the changes found in cases of phosphorus poisoning.

The conditions found in the bowel corresponded with those that had already been described—death of the superficial epithelium, often with necrosis of the villi, and the penetration of the characteristic bacilli into the villous structures and the lumen of the follicles of Lieberkühn. The destruction of the epithelium was evident in examinations made as soon after death as possible, and was clearly a vital and not a cadaveric change. A well-marked diphtheritic process in the bowel was of less common occurrence.

Hemorrhagic infarction of the endometrium was observed in 65 per cent. of post-mortem examinations of adult women. In a number of these cases there was also hemorrhage into the stroma of the ovaries. A diphtheritic process was rarely found in the vagina, and still more rarely in the bladder.

In isolated cases degenerative processes were found in the muscles of the larynx and in the diaphragm (Dr. Boltz). Regressive changes were never found in the liver, though frequently in the heart muscle. Hemorrhages into the medullary tissue of bone appeared to be characteristic of recent cases.

Comma bacilli could not in any case be cultivated from the blood of internal organs, with the exception of the intestine. In one case in which the wall of the stomach presented superficial necrosis, invasion by typical bacilli was demonstrable.

Comma bacilli were looked for in all cases; as also in the many post-mortem examinations made by Dr. Simmonds at the old German Hospital—for the first time upon so large a scale in Europe. The conclusions of Koch were again confirmed throughout their entire range. In fatal cases the specific bacilli were found present in the intestinal contents until the eighteenth day of the disease; on the other hand, in some cases comma bacilli could no longer be found at a comparatively early date. From a study of their behavior in cultures in milk and in gelatin of varying degrees of alkalinity, E. Fraenkel¹ succeeded in demonstrating certain new biological peculiarities of the cholera bacillus. As the

¹ Dr. Eugene Fraenkel, *Deutsche medicin. Wochenschr.*, 1892, No. 46, p. 1047.

epidemic began to subside it became possible to pursue the bacteriological diagnosis also clinically; in the last weeks of the epidemic this procedure was adopted in every case, both within the hospitals and without.

On account of the great demands made upon the time and resources of the physicians, it was not possible to study bacteriologically the large number of cases of mild and transient intestinal derangement that were particularly numerous at the beginning of the epidemic. That such cases are etiologically instances of cholera, as numerous clinical observations in this and in other epidemics would lead one to surmise, has already been demonstrated by Cantani¹ by the detection of cholera bacilli in the stools. This observation was confirmed in some cases at Hamburg and in some at Berlin.²

Most extensive investigations in this direction during an epidemic of cholera would have been necessary to have enlarged the range of our views concerning the specific infections, and to have furnished grounds for a positive conclusion as to the part played by the individual disposition to a definite and well-known disease poison. This important factor, in its intimate nature unexplained and unknown though it may be, cannot be ignored in any consideration of the doctrine of the contagiousness of certain bacteria.

A CASE OF CONGENITAL ELEPHANTIASIS OF THE SCALP.

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CARE should be taken to avoid confounding in one and the same nosographical species all the various forms of elephantiasis; it is an error which has been committed by several observers, to try to generalize under the same scientific conception, in virtue of their etiology, all the forms of this morbid process.

It is certainly unreasonable to deny the causal influence of filariasis in the production of the endemic elephantiasis of warm countries because of the non-parasitic nature of certain analogous sporadic forms which are met with everywhere. But it seems to me equally gratuitous to suppose that every case and kind of elephantiasis occurring in warm countries has a parasitic origin.

¹ Berliner klin. Wochenschr., 1892, No. 37, p. 914.

² Ibid., No. 39, p. 972.