I

THE "NON-VEREAL" OR CLIMATIC BUBO

A CLINICAL STUDY OF A SERIES OF CASES OCCURRING IN A NAVAL HOSPITAL AND ON BOARD SHIP, WITH A DISCUSSION OF VIEWS OF RECENT AUTHORITIES*

By Surgeon-Commander P. L. GIBSON, B.M., R.N.

PART I

(1) DEFINITION

A NOT uncommon complaint among sailors and others who have spent a considerable time in the hotter countries of the world is an enlargement of the glands in the groin, unconnected with any obvious venereal infection. In contrast to the obvious venereal bubo, which is secondary to active syphilis, gonorrhœa or soft sore (ulcus molle), this disease is frequently termed the "Non-Venereal Bubo." A considerable literature is growing up on this subject under a variety of names, such as Climatic Bubo (Manson-Bahr, Hanschell *et al.*), Tropical Bubo (or adenitis) (Virgillo, etc.), Inguinal Lymphogranulomatosis (Nicholas and Favre *et al.*), Inguinal Poradenitis (De Bellard *et al.*), Inguinal Adenopathy (Lebeuf *et al.*), Pestis Minor (Cantlie *et al.*), Strumous Bubo, Granuloma Venereum (Clement).

An attempt has been made here to study this disease from a clinical point of view, and to see in what respects the picture gained agrees with or differs from the experience of other observers; and, in the absence of any certain knowledge of the cause, to make the clinical study as detailed as possible in the hope that perchance some new aspect of the disease might emerge.

(2) THE ANATOMY OF THE GLANDS IN THE INGUINAL REGION¹

The inguinal glands are divisible into two groups:—

- A. Superficial.
- B. Deep.

* Received for publication, September, 1930.

BRITISH JOURNAL OF VENEREAL DISEASES

A. The superficial glands are also divided into two groups :—

(1) *The inguinal glands* are often absent ; they lie superiorly to Poupart's ligament in the superficial fascia and receive lymph from the inferior and anterior part of the abdominal wall. They are scattered members of the second group, the subinguinal glands, and drain into these or the deep subinguinal glands.

(2) *The subinguinal glands* (really two groups). These are (a) *the proximal group* (the inguinal glands of the old terminology ; these lie along the inferior border of Poupart's ligament, and may extend from the anterior superior iliac spine to the pubic spine. *The lateral group* receive afferent lymphatics from the lower and lateral parts of the abdominal wall, the buttocks and the proximal and lateral parts of the thigh. *The medial group*. The pubic glands (of the old terminology) receive afferents from the anal canal, perineum, skin of penis and scrotum and the pubic region.

(b) *The distal group* (old terminology, the femoral glands). These lie along the proximal part of the internal saphenous vein on both sides. These glands receive the afferent lymphatic vessels from the whole of the skin of the leg, except that on the outer part of the foot, the heel and part of the back of the leg.

The afferents of groups (a) and (b) go to deep subinguinal glands.

B. *The Deep Subinguinal Glands*.—These are three to seven small glands which lie in the femoral triangle, some of them in the femoral canal. The afferent vessels come from all the superficial inguinal and subinguinal glands, the vessels of the deeper parts of the penis and the femoral vessel lymphatics. The afferent vessels drain to the external iliac glands.

The external iliac glands form three chains, which lie along the outer side, superficial to and along the inner side of the external iliac artery.

(a) The afferents of the lower glands are received from the superficial and deep subinguinal glands, from the urethra and deeper parts of the penis, and from the lower and deeper part of the abdominal wall.

(b) The higher members of this group receive afferents from the membranous urethra, the prostate and the bladder, and, in the female, from the vagina and neck of the uterus.

THE "NON-VEREREAL " OR CLIMATIC BUBO

Thus, briefly, the afferent lymphatic vessels of the inguinal and external iliac glands come from two main sources :—

- (1) The skin of the whole body approximately from the level of the umbilicus downwards.
- (2) The inferior part of the urogenital tract. It will be necessary to consider the latter in a little more detail.

THE LYMPH DRAINAGE OF THE LOWER UROGENITAL TRACT IN THE MALE ²

The lymphatic drainage of the prostate terminates chiefly in the hypogastric and sacral glands, but one trunk from the posterior surface ends in the external iliac glands, and another goes from the anterior surface to join the vessels which drain the membranous part of the urethra.

The afferent lymphatics of the bladder are arranged in two groups, one from the anterior and one from the posterior surface of the bladder. The former drains into the external iliac glands and the latter into the hypogastric external and common iliac glands.

The lymphatics of the cavernous portion of the urethra accompany those of the glans penis and end in the superficial and deep subinguinal and external iliac lymph glands. Those of the membranous and prostatic urethra pass to the hypogastric lymph glands.

The lymphatics of the vas deferens drain to the external iliac group of glands.

The lymphatics from the vesiculæ seminales drain partly to the hypogastric and partly to the external iliac groups of glands (according to Robinson, to the external iliac group of glands only).

Lymphatics of the penis (Buchanan) ³ are divided into a superficial and deep set.

The lymphatics of the prepuce form a finely meshed plexus, which, in the region of the corona, communicates with the lymphatics of the glans penis. The collecting trunks of the plexus pass back, forming a single median vessel, or double (bilateral) vessels, or sometimes multiple vessels. These run along the dorsum of the penis and receive afferent tributaries from the supra-thecal portions of the penis. At the symphysis pubis the vessels turn some to the right and others to the left, and running

BRITISH JOURNAL OF VENEREAL DISEASES

under the skin end in the superficial inguinal glands. There is a free cross anastomosis, so that glands of either side may be infected from a septic focus of one side.

The lymphatics of the glans form a finely meshed plexus, the collecting trunks of which pass down at the side of the frænum, and, after communicating with the lymphatics of the prepuce and the anterior part of the urethra, pass dorsally surrounding the corona of the glans penis. After this they run back on the dorsum of the penis, parallel to those of the prepuce, but lying deep to the sheath of the penis, instead of superficial to it, and they receive tributaries from the infra-thecal part of the penis. At the symphysis pubis they form a plexus in which occasionally small lymph nodules are to be found, and then they pass out to the deep inguinal glands, or through the crural or inguinal canals to the internal and external chains respectively, of the external iliac glands.

The above description is supported by two venereal cases which I have seen recently.

The first patient had a sloughy ulcer on the dorsum of the penis just proximal to the glans and acute balanitis. There was a red line going up the centre of the dorsum of the penis to a minute tender lump the size of a small pea on the front of the pubis at the base of the penis. Both pubic glands were enlarged and tender. The second patient had an ulcer on the left of the dorsum of the penis proximal to the glans penis. After two or three days the right pubic glands became enlarged and tender, no other primary focus being visible. This is readily explicable in the above scheme of distribution of lymphatics.

(3) HISTORICAL SURVEY

In this connection it is interesting to note that Home ⁴ reports that in 1854 female nurses were replaced by male nurses at the Royal Naval Hospital, Haslar, because at one of their inspections their Lordships were pained at finding women poulticing male patients suffering from buboes. However, we are not enlightened as to the nature of these buboes, whether they were venereal or otherwise.

Bodner and Ruber,⁵ in 1879 first distinguished climatic bubo from venereal disease and tubercular adenitis.

THE "NON-VEREAL" OR CLIMATIC BUBO

Cantlie and, later, Cobb and Simpson considered climatic bubo was a form of attenuated plague. Ruge reported an epidemic in a ship, and Chassaigue first reported the disease in Europe. Nelaton and Hardy in 1890, and Lejars in 1893, suggested that the condition was a transmissible venereal disease.

Durand Nicholas and Favre⁶ in 1913 described a condition which they called subacute inguinal lymphogranulomatosis. They considered that the disease affected male adults as a rule (only one woman patient recorded), and that the cause of the condition was unknown. A pathological lesion called a "Stellar abscess" was described.

Chastang⁷ in 1922 considered that subacute inguinal lymphogranulomatosis of Nicholas, Favre and Durand was not the same disease as climatic bubo, because in the former there was:—

(1) A transient herpetic ulceration of the penis prior to the adenitis.

(2) Successive foci of suppuration were present in the lymph nodes.

(3) The enlarged glands were not preceded by bouts of fever, whereas in the latter

(a) The bubo was a bubo from the first and there was no antecedent lesion.

(b) There were epidemics among people living in similar conditions.

The disease was considered to be mycotic in origin and intensive iodine treatment was advised.

In 1924, Gamna⁸ and Favre⁹ independently found small "corpuscular elements" in the protoplasm of certain large cells in the affected glands of climatic bubo patients. These "corpuscular elements" which stained deeply with nuclear stains, were called "Inclusion bodies," and were considered to be parasites. Their presence has since been confirmed by Todd in this country.

In 1926, Hanschell¹⁰ summarised the knowledge of the disease up to that date and advocated treatment of the condition by protein shock therapy.

Frei and Hoffmann¹¹ in 1927 obtained a specific dermal reaction from patients suffering from subacute inguinal lymphogranulomatosis, and by means of this reaction showed that this disease was identical with climatic bubo.

In 1928, Fischer,¹² using Frei's skin reaction, confirmed the identity of climatic bubo and subacute

BRITISH JOURNAL OF VENEREAL DISEASES

inguinal lymphogranulomatosis and differentiated it from ulcus molle.

(4) INCIDENCE

At the home hospitals in the Navy, the non-venereal bubo is uncommon ; thus between September, 1929, and January, 1930, only 1 patient was admitted to the R.N. Hospital, Chatham, and he was subsequently found to be suffering from a penile sore. In China, on the other hand, it is a relatively common disease occurring in nearly 1 per cent. of all the personnel on the station. Thus, in 1927, total personnel 13,200, there were 121 cases of disease of glands,¹³ most of which were cases of non-venereal bubo (see below). Home⁴ also, in a carefully prepared series of statistics covering ten-year periods since 1862, showed that China and the East Indies had a higher percentage of cases than any other naval station.

During three years, from May, 1926, to April, 1929, 62 cases of the disease were under treatment at the R.N. Hospital, Hong Kong. These occurred as follows :—

1926 : Last eight months, 5 cases.

1927 : 15 cases. Total number of patients treated in hospital, 1070.

1928 : 32 cases. Total number of patients treated in hospital, 1140.

1929 : First four months, 10 cases.

Thus, in the two years for which complete figures are available, 1927 and 1928, there were case incidences of 1.4 and 2.8 per cent. respectively of N.V. bubo among the total admissions to the hospital. Also in 1929 three-quarters of the cases of disease of glands admitted and in 1928 seven-eighths of cases of disease of glands were non-venereal buboes.

It will be seen from the figures quoted above that the disease appears to be one on the increase in the Fleet at Hong Kong. This increase is, however, probably more apparent than real, the figures for the earlier periods being under-estimated owing to a large proportion of the N.V. bubo patients being treated in the venereal wards.

EPIDEMIOLOGY

Most of the cases in this series were sporadic in occurrence, but three minor epidemics occurred, as has been observed by Günther.¹⁴

THE "NON-VEREAL" OR CLIMATIC BUBO

These epidemics, if they can be so styled, were furnished by

(a) Aircraft carrier, 3 cases. Enlarged glands appeared first in September in one and October, 1928, in two others.

(b) Another aircraft carrier, 3 cases. Gland affection started on January 4th, 17th and 28th, 1928, respectively.

(c) Submarine depot ship, 3 cases. Gland affection started in one February 17th, 1928, and in two others March 4th and 25th, 1928.

The epidemics do not appear to be true epidemics, such as occurs with specific infective diseases, *e.g.*, plague or cholera, since no special methods appear to be necessary to control the disease.

(5) ÆTIOLOGY

AGE

The disease is one of young adults; it has been recorded in a man of sixty-one,¹⁵ also in a woman of fifty-eight.¹⁵ In my series of 62 cases the average age was 25.3 years; there were 12 men aged thirty or over, the eldest of whom was forty years old. There were 9 patients of under twenty years. Age did not appear to affect the severity of the infection.

SEX

Males are almost exclusively affected.^{10 17} Müller and Justi¹⁸ assert that even the prostitutes, who, they consider, carry the infection, are not affected.

Frei and Hoffman,¹¹ however, report 4 women who suffered from the disease.

I am indebted to Dr. E. R. Garnett Passe¹⁶ for information about the following patient.

Résumé of Case.—A woman of fifty-eight was admitted to the London Hospital with a uterine fibroid and a purulent vaginal discharge. The fibroid was removed February 21st, 1929, and the discharge ceased after this. On August 5th, 1929 she was again admitted with a large abscess in the left groin, involving the left inguinal glands; the vulva and vagina were free from lesions; temperature and pulse were normal throughout. Treated successfully by free incision.

BRITISH JOURNAL OF VENEREAL DISEASES

CLIMATE

The disease is one acquired mainly in the tropics and sub-tropics,^{10 14 17 18 19 20}; but it appears to occur in northern climates, Sweden²¹ and Germany.²² The relative frequency of the disease in the British Navy in China has already been alluded to, though the seasonal incidence has not been discussed.

In Hong Kong the climate varies considerably at different times of the year, but it can roughly be divided into a hot and a relatively cool period.

April to September Period 1.—The hot period; weather damp and hot (this is also the wet season). The heat increases to a maximum in July or August, whereas the humidity is greatest in May or June (when it reaches nearly 100 per cent.).

October to March, Period 2.—The relatively cool period: weather comparatively dry and temperature getting cooler till it reaches a minimum about January.

Of my series, 20 patients were admitted to the Naval Hospital during Period 1, and 42 during Period 2. This difference is accounted for by the absence of the bulk of the China Fleet from Hong Kong during the hot weather, which includes most of Period 1. The small ships—destroyers, sloops and gunboats—move to a large extent independently of the main fleet, and admissions from these craft give the following figures: 15 for Period 1 and 12 for Period 2.

In contrast to the above, the admissions from the commoner skin affections, which are known to be much influenced by the temperature and humidity, were for Period 1, 81, and for Period 2, 51 (in spite of the absence of the Fleet during most of Period 1). The skin lesions included in the above were tinea (cruris), boils, cellulitis and eczema.

It would, therefore, appear that though the hot weather *per se* does not have any marked effect on the incidence of this disease, residence in a tropical or sub-tropical climate appears to predispose to it.

OCCUPATION

It has been suggested that the disease is commonest among sailors of all nationalities by some observers^{10 18}; others speak of it as an affection of the crews of

THE "NON-VENEREAL" OR CLIMATIC BUBO

warships.^{4 17 19 20} It is further suggested that engine room ratings are more prone to get this disease than the rest of the ship's company. Müller and Justi¹⁸ say that three-quarters of their cases were engine room ratings, and Hanschell²³ found it to be, in Mercantile Marine patients, three times more frequent in engine room officers than upper deck officers, and the proportion of his cases among firemen to those among stewards and forecastle hands was 2.5 : 1 ; 2 : 1 respectively.

In my series 61 out of 62 came from the crews of warships ; 2 were R.A.F. airmen, 1 from an aircraft carrier, and 1 from the R.A.F. Base, Kai Tak ; in the case of 5 others, the actual ship was not ascertained, and these are excluded in the analysis. In no case during this period or since have I seen an officer affected. I am informed that the disease was not uncommon in the Army in the Shanghai Defence Force, and it occurs frequently in the garrison at Gibraltar, almost completely a military one. I have not observed any case among the European employees in the dockyard at Hong Kong. They are allowed to bring their wives and families out at Government expense.

As regards the rating of the personnel affected, an analysis is shown below :—

Engine Room Ratings. 27.

Stokers	22
Leading stokers	3
Stoker petty officers	2

Upper Deck Ratings. 29.

Able seamen	21
Ordinary seamen	4
Petty officers	2
Leading seamen	1
Ordinary signalmen	1

Miscellaneous. 4.

Telegraphists (W/T)	2
Master-at-arms (ship's police)	1
Sailmaker	1

Royal Air Force. 2.

Aircraftman (1st class)	1
Corporal	1

BRITISH JOURNAL OF VENEREAL DISEASES

Thus, the proportion of engine room ratings to men from other parts of the ship is 27 to 34 (this includes 1 airman in an aircraft carrier).

The following is a list of the types of ships from which affected ratings were sent to hospital :—

<i>Type of ship.</i>	<i>Approx. tonnage.</i>	<i>Nature of fuel.</i>
Light cruisers.	14,000—4,000	Oil.
Destroyers	1,800—1,075	Oil.
<i>Sloops</i>	1,265—800	Coal.
Gunboats	645—90	Oil (chiefly).
<i>Submarine dépôt ships</i>	4,500	Coal.
Aircraft carriers	14,000—10,000	Oil.

Nine light cruisers produced 15 cases of non-venereal bubo (3 engine room ratings and 12 upper deck ratings) out of a total approximate personnel of 5,760, *i.e.*, approximately 0.25 per cent. of personnel infected. The proportion of engine room ratings to all other ratings was about 1 to 3, and the proportion of engine room ratings to other ratings infected was 1 to 4.

Ten destroyers produced 10 cases (4 engine room and 6 other ratings) out of a total approximate personnel of 1,110, *i.e.*, approximately 0.9 per cent. of personnel infected. The proportion of engine room to all other ratings was about 3 to 8, and the proportion of engine room to other ratings infected was 2 to 3.

Eight sloops produced 9 cases (6 engine room and 3 other ratings) out of a total approximate personnel of 630—*i.e.*, approximately 1.5 per cent. of personnel infected. The proportion of engine room to other ratings was about 2 to 3, and the proportion of engine room ratings to other ratings infected was 2 to 1.

Seven gunboats produced 8 cases (2 engine room and 6 other ratings) out of a total approximate personnel of 470, *i.e.*, approximately 1.7 per cent. of personnel infected. The proportion of engine room to other ratings was about 2 to 5, and the proportion of engine room to other ratings infected was about 1 to 3.

Two submarine dépôt ships produced 7 cases (5 engine room and 2 other ratings), out of a total approximate personnel of 573—*i.e.*, approximately 1.3 per cent. of personnel infected. The proportion of engine room to other ratings was about 2 to 3, and the proportion of engine room to other ratings infected was 5 to 2.

THE "NON-VENEREAL" OR CLIMATIC BUBO

Two aircraft carriers produced 7 cases (4 engine room and 3 other ratings) out of a total personnel of about 1,286—*i.e.*, approximately 0.5 per cent. of personnel infected. The proportion of engine room to other ratings was rather over 1 to 2, and the proportion of engine room ratings infected to others was 4 to 3.

It therefore appears that the disease is especially common among seamen of all nationalities, and, perhaps it should be added, in the fighting services abroad; it does not, however, appear to be limited to these classes. Figures of the incidence of the disease in the Navy in China are too small to prove anything, but as far as they go they show that (1) officers in the Navy are rarely affected; (2) a higher percentage of the crews of small ships are infected than is the case in bigger ships; (3) a higher percentage of the crews of coal-burning ships are infected than is the case in oil-burning ships of the same size; and (4) that engine room ratings in oil-burning ships as a whole are not more affected than the rest of the ships' company. [Destroyers and aircraft carriers show an exception to this; although they burn oil fuel, they show a higher percentage of engine room ratings affected, somewhere in the region of 2 to 1.] But in the case of coal-burning ships engine room ratings are definitely affected more frequently in slightly over the proportion of 3 to 1.

IRREGULAR SEXUAL CONNECTION

On this subject Manson Bahr¹⁷ quotes Rost, who gives sexual connection with native women as a probable cause of the disease. Ravant and Sheikevitch¹⁵ quote the case of a man aged sixty-one who developed the disease and a small ulcer like a burst herpes on his penis a few days after irregular intercourse. Müller and Justi,¹⁸ in a careful review, speak of 8 cases in which the glands appeared three weeks after coitus; 3 of these patients were infected in the same brothel in Batavia. Hanschell¹⁰ considered that a history of coitus in the tropics or sub-tropics is one of the essential diagnostic criteria. Günther,¹⁴ in an analysis of 35 cases of climatic bubo, obtained a history of promiscuous sexual intercourse abroad in every case. The probable sources of infection in these cases were:—

BRITISH JOURNAL OF VENEREAL DISEASES

Mediterranean .	3	East Africa .	6	Africa .	6
Australia .	1	S. America .	5	Calcutta .	3
Java .	9	Black Sea .	2		

In 19 cases of my series the question of promiscuous sexual intercourse was especially investigated, and the history was found to be positive in 16 and negative in 3.

In two of the negative cases there was a past history of gonorrhœa, and the glands developed subsequently to a number of boils in the sacral region in one, and to a contusion of the sacral region in the other.

In the third case in which no history was obtained there was no other primary focus, but I think the history is not reliable as far as sexual intercourse is concerned, especially as pus cells were found in the prostatic smear.

In the 16 positive cases connection had been with Chinese or Japanese, 14; Eurasian, 1; and a black woman (Java), 1. In 8 of the cases it occurred four to six weeks before the gland affection appeared, in 2 it occurred six to eight weeks, in 1 it was two weeks, and in another three weeks before the gland affection appeared. In 4 cases the time was not ascertained.

THE PRESENCE OF A PRIMARY GENITAL LESION

Pigeon and Le Bourdelles,²⁴ after a careful examination, failed to find any primary lesion on the genitals in 206 cases; but Hanschell¹⁰ found in 2 cases small shallow ulcers in the post-coronal sulcus of the glans penis, which healed readily after swabbing with spirit. Günther¹⁴ also states that a pimple herpes or shallow ulcer is often the primary lesion. Ravant and Sheikevitch¹⁵ described an ulcer like a burst herpes in 1 case, and Müller and Justi¹⁸ considered in 3 cases the entry of the virus was through an infiltration of the prepuce. Verdelet and Auché²⁵ in 2 cases also found small penile lesions.

In my series 2 patients only had small herpetic ulcers five and seven weeks respectively after sexual intercourse with Chinese. Both healed in a few days, and 1 patient had a history of an ulcer appearing about seven weeks after intercourse and healing readily. One other had an ulcer near the frænum, sequela of the burn from nitric acid applied to a wart, and one a slight urethral discharge containing no organisms and very little pus. Three others

THE "NON-VEREAL" OR CLIMATIC BUBO

had a mild degree of balanitis. This gives a total of 8 patients with penile lesions, but only 3 with the type of ulcer described; it is very possible that, owing to the rapid healing of such an ulcer, it may, in many cases, have been undetected by the patient and healed at the time of medical examination.

THE QUESTION OF CIRCUMCISION

Hanschell¹⁰ considers that an important predisposing factor is the presence of the foreskin. He states: "I have yet to see the disease in the circumcised." He had not observed it in Mahomedans and Jews, nor in the Indian Lascars, who are Mahomedans, circumcised and clean shaven, whereas he had seen "Climatic Bubo" not rarely in prepuce-bearing Chinamen, Europeans, and uncircumcised Christian Indians.

My experience confirms this in the main; all except 2 of my patients were uncircumcised. One exception had no obvious primary lesion elsewhere, though there were a few small sudamina on both buttocks. This, however, was considered insufficient to account for the left inguinal bubo. The other had had eczema of the feet for some time, a contusion of his back a few days before the glands developed, and a past history of gonorrhœa on three occasions—last attack two years previously.

RELATIONSHIP TO VENEREAL DISEASE

Treibly found no venereal history in 25 cases except 1 patient with a history of gonorrhœa a year previously. Violato²⁶ reported a case, a man of thirty-four, with no venereal history and enlarged left inguinal glands, which he considered to be possibly tubercular. Bouffard²⁷ reported a number of cases in Abidjan, Ivory Coast, in whom he believed there was no venereal history. On the other hand, Virgillo²⁸ gave details of 6 cases identical with climatic bubo, the origin of which was sexual. In 5 there were abrasions of the penis on the glans or prepuce and venereal ulcers or sores on the leg. A sixth patient had had gonorrhœa. The identity of the diseases of these 6 patients with the non-venereal bubo would seem open to question. Ravant and Sheikevitch¹⁵ consider

BRITISH JOURNAL OF VENEREAL DISEASES

the disease an entity distinct from syphilis and soft chancre.

In a disease in which a history of promiscuous sexual intercourse is so frequently obtained it would be expected that a past history of venereal disease would be obtained in a large percentage of cases. The venereal histories of the series under consideration, as far as can be ascertained, is as follows: 11 patients gave a past history of gonorrhœa, and in 1 patient the prostatic secretion contained pus cells and Gram-negative extra-cellular organisms; of the 11 patients with a definite history, 4 had had gonorrhœa one year previously, 2 two years, 1 four years, 1 eight years, and 1 fifteen years before. In 2 cases the dates of the previous attacks of gonorrhœa were not specified; one of these had a history of seven previous attacks or relapses. Seventeen patients gave a definitely negative history of gonorrhœa.

Syphilis.—The Wassermann reaction was done in 37 cases. It was positive in 14 and negative in 23 (5 ++, 4 +, and 5 - were the grading of the positive reports).

Soft Sore.—There was a history of chancroid in 1 case two years previously.

In no patient of the series was there any active sign of venereal disease, but it is conceivable, or even probable, that a latent infection remained in the urethral glands in the cases of more recent attacks of gonorrhœa, and especially in the case of the man with the history of many gonorrhœal relapses, and this could readily account for an inguinal adenitis arising after further sexual effort, or possibly after some form of trauma. The persistence with which the gonococcus clings to the posterior urethra is exemplified by the following case: A stoker, aged thirty-five, was admitted to hospital in August, 1928, with a swelling in the perineum of four days' duration following a slip when he was getting on board out of the boat, the legs being forced far apart, one remaining in the boat and the other being placed on the gangway of the ship. As some fever developed and the swelling became more tender, it was incised under general anæsthesia, and a specimen of the pus which poured out showed many Gram-negative intra-cellular diplococci. There was no history or evidence of recent gonorrhœa.

As regards syphilis, all the cases in my series who

THE "NON-VEREREAL" OR CLIMATIC BUBO

had strong or moderately strong positive Wassermann reactions had glands which clinically were not syphilitic in character. The pure syphilitic adenitis does not suppurate and there is no periadenitis, whereas the glands in these cases possessed these characteristics. In such cases it was regarded that syphilis, when present, was coexistent. Out of 62 cases 24 had a history of gonorrhœa or a positive Wassermann. In 2 cases both were present and 1 had a history of chancroid.

THE QUESTION OF SKIN LESIONS

In a tropical country cutaneous lesions are more prevalent than in the temperate zones, so that it would be remarkable if a percentage of the sufferers of the non-venereal bubo did not often suffer from some form of skin trouble; there was not, however, as has been pointed out earlier, the great seasonal rise in the occurrence of the N.V. bubo that was observed in the case of cutaneous lesions during the hot weather at Hong Kong.

In the 62 cases of the series, 24 had cutaneous affections or a history of them and the remainder had no obvious lesions, though in 7 of the latter group the major portion of the treatment had been carried out elsewhere, so that it is possible in these cases that skin affections had existed and been cured before admission to hospital.

The cutaneous conditions noted were :—

Eczema, 6 cases.

Sudamina, 3 cases.

Abrasions feet and legs, 5 cases.

Boils, 8 cases.

Tinea cruris (Dhobie itch), 3 cases.

"Scabies of groin" (history), 1 case.

In two cases co-existent lesions occurred. In each case the conditions were Dhobie itch and eczema of the toes. (Hong Kong foot, so called; probably also a mycotic disease.)

It was considered in 14 cases that the skin lesion was possibly responsible for the swollen glands; in 10 cases, however, it was considered definitely insufficient.

There was a history of trauma in 10 cases prior to the glands swelling, as well as a skin lesion. The trauma con-

BRITISH JOURNAL OF VENEREAL DISEASES

sisted of a strain in 3 cases, a contusion of the back in 2 and of the groin in 1, a contusion of the leg in three and a blow in the testicles in 1. In the last case, an old gonorrhoea patient, the history is open to grave doubt.

THE INFECTING AGENT.—This is unknown.

PROTOZOAL THEORIES.—It has been suggested that it is protozoal in nature.

Donovan Bodies.—Clément²⁹ suggests that Donovan bodies are the cause of the condition, but brings no conclusive evidence in its favour.

An Amœba.—Ravant³⁰ in one case found large amœboid cells which he considered the cause of the condition.

Intra-cellular Parasites.—Gamna⁸ and Favre⁹ independently found small oval or elliptical intra-cellular bodies, 2 or 3 μ in length and staining highly with nuclear stains, in affected glands. The presence of these "cell inclusions," as they were called, which were considered to be parasites, has been confirmed by Virgello³¹ and by Todd³² in this country. De Bellard and Uribe³³ have found bodies of a similar nature, which they term "chromatic inclusions," in large mononuclear cells.

Spirochæte.—Fischl³⁴ obtained what he described as a contaminating spirochæte from lesions. This disappeared after tartar emetic injections.

BACTERIAL SUGGESTIONS.—*Ducrey's Bacillus*.—Koppel³⁵ called attention to the similarity of the glands in ulcus molle (soft sore) and lymphogranuloma inguinale (non-venereal bubo), and pointed out that at Breslau, since the latter has become more common, the former, ulcus molle, has become more rare. A causal relationship between the two appears to be inferred.

Tubercle Bacillus.—Violato²⁶ considered in 1 case in which cultures were negative that the infecting organism was possibly the tubercle bacillus.

No Specific Organism.—Pigeon and Le Bourdelles,²⁴ Hanschell,¹⁰ Günther¹⁴ and Bouffard²⁷ have found no specific organisms, while Verdelet and Auché²⁵ obtained staphylococci from the extirpated glands in one case and no growth in another. This is also the experience obtained from the bacteriological examinations made from the pus derived from broken-down glands in my series, the reports being either "no growth" or "staphylococci in pure culture."

THE "NON-VEREAL" OR CLIMATIC BUBO

(6) PATHOLOGY

THE PATHOLOGICAL ANATOMY OF THE GLANDS

Destephana and Vaccarezza³⁶ described three stages in the affection of the glands:—

Of 72 cases, 38 were in Stage 1. The indurated stage.

28 were in Stage 2. Suppurating.

6 were in Stage 3. Fistulous.

In the 1st Stage the glands are described as hard with periadenitis,³³ and five or six glands adherent to one another.²⁶

In the 2nd Stage the glands are necrotic with hæmorrhagic foci³³; there is a fibrous network in the meshes of which are relics of glands bathed in sero-pus.³⁰ It is again described as a periadenitis with a local congestion of the glands, with points of suppuration present.²⁴ When the skin becomes involved and breaks down the 3rd or fistulous stage results.

MICROSCOPICAL FEATURES. EXAMINATION OF SMEARS AND FILMS

The majority of observers have failed to find bacteria or parasites in films from the pus or sections of the glands,^{14 24} though Hashimoto³⁷ found a *Staphylococcus aureus* and a streptococcus in smears from 2 out of 4 gland masses examined.

On the other hand, Ravant³⁰ found in pus from one broken-down bubo, macrophages and large amœboid cells resembling *Amœba coli* and exhibiting active amœboid movement when warmed, and Todd³² claims to have found in 2 cases cell inclusions in large endothelioid cells which were considered to be parasites; the fluid he examined he obtained by gland puncture. These "cell inclusions" were first described by Gamna⁸ in 1924. He writes: "Sections of glands show many varieties of cells, among which lymphocytes predominate. The cells of the reticulum are swollen and show many mitoses; in many cells are found small corpuscular elements 2 to 3 μ in size, of elliptical form and staining deeply with Hæmatoxylin."

Favre⁹ shortly after published his results, which were similar but obtained independently. He found the corpuscular elements or "cell inclusions" in the initial

BRITISH JOURNAL OF VENEREAL DISEASES

lesion as well as in the glands themselves. He did not find many mitotic figures in the cells of the reticulum. Todd³² explains this discrepancy by pointing out that in the early stages proliferation first of lymph and plasma cells then of the reticulum occurs, and during this period frequent mitoses are visible; in the latter stages degeneration is the chief feature present, and during this period few mitotic figures can be found, polymorph leucocytes are present and eosinophils are scanty. Fischl,³⁴ using smears from the glands, has never found any Donovan bodies, but claims to have found a contaminating spirochæte on more than one occasion.

Violato²⁶ found that the pus cells in films from his case were mononuclear rather than polynuclear, but no organisms were found.

SECTIONS OF GLANDS

Hanschell¹⁰ found that in sections of glands there are no organisms or constant histological differences which distinguished the morbid changes from those seen in inflamed glands resulting from scabies or *ulcus molle* of the genital area. Günther¹⁴ considered that the histological picture is one of a proliferative inflammation with degeneration of tissues, but Hanschell¹⁰ has pointed out that the endothelial proliferation as opposed to rounded infiltration is not constant. Hashimoto³⁷ and Violato²⁶ state that sections of the glands negative tubercle and syphilis.

De Bellard and Uribe³³ have described in some detail a condition which they call a "Stellar abscess," and claim to have found the condition in a gland of an inoculated animal. Their description is as follows: "There is a central homogenous mass, invaded by polymorphonuclear leucocytes and large mononuclears which contain 'Chromatic Inclusions.' External to these there is a wall of epithelioid cells but separated by an acellular zone which is thrown into folds or radiating lines." (It is these folds which are supposed to give it a resemblance to a star.) In the inoculation abscesses the formation was the same, but there were no chromatic inclusions in the mononuclear cells. This condition of Stellar abscess formation was first described by Nicholas Favre and Durand in 1913.⁶

THE "NON-VENEREAL" OR CLIMATIC BUBO

Sei³⁸ described three stages in the histological changes of the gland in climatic bubo. (1) Early stage of fibrinous inflammation, together with patches of desquamated endothelioid cells round the damaged vessels. (2) Later necrosis of these patches. (3) Later gland substance and reticulum is invaded by proliferating connective tissue, the fibres of which are thickened and involved in a hyaline collagenous network. This whole mass very quickly breaks down.

There is at present no uniformity in the histological findings. This is probably due to the difference in the picture which the glands present at different stages of the disease.

CULTURAL EXAMINATIONS

Cultures from broken glands are negative.^{10 26 27} Pigeon and Le Bourdelles,²⁴ using nine different culture media, found that cases which were not septic were sterile. On the other hand, Hashimoto³⁷ obtained in 2 cases a streptococcus and a *Staphylococcus aureus*, and Verdet and Auché²⁵ in 1 case cultivated a staphylococcus from a mass of removed glands.

INOCULATION EXPERIMENTS

Animal inoculation experiments were negative^{11 14 24 37 39} in the hands of everyone who has attempted them with two exceptions. The positive results were obtained by (1) Virgillo,³¹ who withdrew the pus from the inguinal gland of a patient with sub-acute lymphogranuloma and injected it subcutaneously into the inguinal region of two guinea-pigs. A month later, a nodule the size of a millet seed appeared, which on excision proved to be a gland, with a central focus of coagulation necrosis and in some of the cells of which were found the intracellular bodies of Gamna and Favre. (2) De Bellard and Uribe³³ had positive results in two cases in monkeys with a more convincing experimental technique. One c.c. of a saline emulsion of a gland was inoculated into the left side of the prepuce; fourteen days later a red swelling appeared at the base of the penis, and one month later the inguinal glands began to become enlarged more on the right side. The glands were excised and on section showed "Stellar abscess" formation, but no "chromatic inclusions" were found in the mono-

BRITISH JOURNAL OF VENEREAL DISEASES

nuclear cells, as in those of the glands from which the inoculated material was originally obtained.

SPECIFIC DERMAL REACTIONS

Frei and Hoffmann¹¹ have devised a specific dermal reaction for cases of lymphogranuloma inguinale. This technique is as follows. The material from a soft un-irrupted gland is aspirated and diluted with saline 5 to 10 times; it is then heated to 60° C. for two hours on the first day and to the same temperature for one hour on the second day. The material is then ready for use and 1 c.c. is injected subcutaneously into the upper arm of the patient. A local reaction is seen on the second day in positive cases—no reaction present in controls. Their results were definite. They obtained positive reactions in 31 out of 32 cases of lymphogranuloma inguinale when they used this emulsion. Using a pseudo-diphtheroid bacillus emulsion they got frequent positive results, and using other organisms (*S. aureus*, *S. albus*, *B. coli*, etc.) there were less frequent positive results in similar cases. In a later communication Frei²² confirmed and elaborated these results: the skin reaction for lymphogranuloma inguinale is specific for this disease if the antigen is obtained from an unquestionable source; it does not give positive results with enlarged glands secondary to ulcus molle, though a specific skin reaction has been prepared for this disease. Positive skin reactions for climatic bubo also may be obtained many years after an infection.

Hellerstroem,²¹ working in Stockholm, has confirmed Frei's results, using both his own and Frei's antigen. He obtained positive results in 26 climatic bubo cases and negative results in 11 venereal cases as controls. If the antigen was heated to 100° C. or an emulsion of Ducrey's bacillus was used, his reactions in climatic bubo cases were negative.

Fischer,¹² using antigen prepared from European cases by Frei's technique, obtained positive results in 11 cases of climatic bubo originating in other continents; his results were negative in controls of patients with soft sore, syphilis and glandular enlargements from other causes.

The reaction varies from a local redness and infiltration

THE "NON-VENEREAL" OR CLIMATIC BUBO

to the formation of a vesicle like a vaccination pustule; it lasts four days, but the best time to see it is after forty-eight hours. There is no general reaction and no glandular swelling.

VACCINE PREPARATION

Delbet⁴⁰ has prepared a vaccine by the following technique: A piece of the gland is excised and cut into small pieces. It is dehydrated for forty-eight hours at 37° C. over calcium chloride. The residue is emulsified in saline. This is injected in increasing doses for 5 injections administered on alternate days.

He has used his vaccine in two patients and obtained complete resolution in one in ten days. In the other old-standing case with fistulæ 10 injections were given. In sixteen days the wounds were healed and the glands disappeared.

(7) CLINICAL FEATURES

One of the chief features of the disease is the paucity of the clinical signs. Hanschell¹⁰ mentions four diagnostic criteria: (1) fever; (2) inguinal adenitis and periadenitis; (3) absence of known more or less common lesions round the anus or genital area; (4) a history that the condition developed after coitus in the tropics or subtropics. (The last condition must obviously be modified if the specific dermal reaction of Frei is accepted, as his antigen appears to have been prepared from patients who had never been out of Europe.)

FEVER

This is of a remittent type,¹⁷ slight except in neglected cases.¹⁴ Hanschell¹⁰ points out that fever may be absent when the case is first seen, and it may develop later, or there may be a past history of fever. It is present always at some stage of the disease, but the temperature is rarely higher than 103° F. It may, however, be high with symptoms of septicæmia (Pardo Castello⁴¹), and Hillsman, Wilshussen and Zimmerman⁴² have reported a fatal case with some observations on the autopsy findings.

In my series I have records of a temperature at some time or other in 30 out of 34 cases. In 11 of these the temperature was over 100°, in 19 it was between normal and 100°, and in 4 cases it was not raised at all. The

BRITISH JOURNAL OF VENEREAL DISEASES

four cases in whom the temperature was not raised were all old-standing cases and may well have had temperatures prior to admission. One of them had been operated upon in the ship before admission and another had a pulse of 96 on admission

The highest temperature noted was 103° in one patient, 4 others had temperatures in the region of 102°.

In 27 patients the pulse was over 80 in 18 (over 100 in 3 and under 80 in 9. The highest pulse rate recorded was 110.

This, then, agrees with the general findings that the fever is not severe.

THE GLANDS

The affection partakes of the nature of a subacute inflammatory swelling of the glands of the groin.^{15 17 27}

SIDE AFFECTED

Observations on this point are usually lacking, but Destephana and Vaccarezza⁴³ reported 85 cases of inguinal poradenitis and Gunther^{14 35} :—

Right side affected (D. and V.)	18 times,	
(G.) 9 times		Total 27
Left side affected (D. and V.)	33 times,	
(G.) 15 times		„ 48
Both sides affected (D. and V.)	34 times,	
(G.) 11 times		„ 45

GROUPS OF GLANDS INVOLVED

Manson Bahr¹⁷ points out that the oblique inguinal glands are the group usually affected. The crural group is rarely enlarged. If both groins are involved, the enlargement of the glands may be concurrent, or one after another. In two cases in which there were penile lesions, Verdelet and Auché²⁵ found the homolateral glands enlarged. Günther¹⁴ points out a very significant fact, that the deep inguinal glands are affected before the superficial ones and that the pelvic glands (probably referring to the external iliac glands) are enlarged in 62 per cent. of cases. There is no lymphangitis. These are most interesting observations when it is remembered the source from which they receive their lymph. Also, in this connection, Nicholas Favre and Lebeuf⁴⁴ reported

THE "NON-VENEREAL" OR CLIMATIC BUBO

a case in which the left inguinal glands were enlarged with masses of swollen iliac glands on each side.

CLINICAL TYPES OF CASES

According to Koppel³⁵ three clinical types of enlargement of the glands are met with :—

- (1) Enlargement of the glands as marked feature and fever slight. This is the commonest type.
- (2) The enlargement of the glands is slight but the fever is severe.
- (3) The glands are enlarged and there are well-marked rheumatic symptoms as well. Duff⁴⁵ reports a case of this nature in which purpura was an unusual feature.

CLINICAL COURSE OF GLAND SWELLINGS

Manson Bahr¹⁷ states that the glands subside slowly, taking weeks or months to do so, but Müller and Justi¹⁸ consider that there is no tendency towards recovery if the disease is left alone, and that the disease is progressive.

In the course of the disease the glands may undergo the following changes :^{17 26 36}

- (1) Peradenitis, the stage of induration.
- (2) Suppuration, the stage of softening.
- (3) Involvement of the skin.
- (4) Fistula formation.

General adenitis has been occasionally noticed.⁴¹

Cervical adenitis instead of inguinal adenitis, the portal of infection being the mouth, has been described by Pardo Castello⁴¹ and by Todd.³²

PERSONAL OBSERVATIONS

Two cases of cervical adenitis (right supraclavicular in each case) have been included in the series of 62, owing to their clinical resemblance to the other cases. In the first case there was a recently healed herpes of right lower lip and the scar of a healed boil in the right elbow, and in the second a recent tonsillitis and some scars of boils on the right shoulder which may give a clue to the primary foci of these 2 cases. Of the remaining 60 cases, the sides noted were as follows :—

BRITISH JOURNAL OF VENEREAL DISEASES

Right side	.	.	16
Left side	.	.	33
Both sides	.	.	8 (57 cases side noted).
Not noted	.	.	3

The external iliac glands were found to be enlarged fifteen times, *i.e.*, in 1 in every 3 in which complete records were kept. In the case of these glands the right side was enlarged three times, the left side was enlarged eleven times, and both sides were enlarged once.

Thus, it is noteworthy that the left inguinal glands were affected just over twice as often as the right, and the left external iliac glands nearly four times as often as the right.

No case of axillary adenitis of this nature has been met with during the period in which these statistics were collected.

As regards the groups of glands affected in the groin, the femoral group were very rarely, the pubic group occasionally only, and the inguinal (the lateral and medial groups of the sub-inguinal glands, as described in Cunningham's "Anatomy," later editions) were by far the most frequently involved. I can also confirm Günther's observation,¹⁴ that frequently the deep inguinal—*i.e.*, those close to the femoral vein and crural canal—are the largest of the glands affected in a non-venereal bubo.

Of the three clinical types of Koppel, only the first, in which the enlargement of the glands was marked and the fever relatively slight, was met with. No case was sufficiently ill to give real cause for anxiety.

The clinical course of the glands was very similar to that described in literature. Out of 59 sets of glands 54 showed some degree of periadenitis, as evidenced by matting together of the glands, usually with induration, and adherence in some cases to the skin and deep fascia. In 53 patients the glands were tender on pressure, in 6 they were not tender. In 14 they were firm on pressure, in 45 the glands were softened and there was some degree of suppuration. This was proved by aspiration in all cases in which the open operation was not performed.

In 24 cases there was an open wound as a result of operative treatment, excision or incision. This last group would correspond to the group of glands with fistula formation, as described by Destephana and Vaccarezza³⁶; actual fistulous tracts were uncommon.

THE "NON-VEREAL" OR CLIMATIC BUBO

THE PRIMARY GENITAL LESION

This has already been dealt with under the heading of *Ætiology*, and there appears to be a general uniformity of opinion on the absence of gross genital lesion, and the occasional appearance of small penile ulcers.

Pardo Castello⁴¹ describes three types of initial genital lesions and states that the mouth and the throat may occasionally be the portal of entry, cervical adenitis resulting in these cases. The incubation period, he states, is one to six weeks. Bouffard,²⁷ however, has never seen a genital lesion, and does not believe in a venereal *ætiology*. The genital lesions in my patients have already been discussed.

BLOOD COUNTS

The blood picture is not constant. In 2 patients, Verdet and Auché²⁵ found a mild polynuclear leucocytosis. Günther,¹⁴ on the other hand, records a slight lymphocytosis in some patients, and an increased percentage of mononuclear occasionally. There were no cases of eosinophilia; he admits that blood counts vary considerably. Todd³² reports anæmia and a mild polymorphonuclear leucocytosis in the early stages.

Wassermann reaction, according to most observers, is negative, though Hashimoto³⁷ found it positive in 4 cases, 3 of whom had poor constitutions.

Blood examinations were done in 6 of my patients, including 2 cases of cervical adenitis. In 2 patients (1 cervical adenitis) there was a mild degree of secondary anæmia (red cells, between four and five million, and hæmoglobin, 75 per cent.).

In 5 patients there was a mild polymorphonuclear leucocytosis (this includes 2 cases of cervical adenitis). The total count ranged from 12,500 to 14,175, and the percentage of polymorphonuclear leucocytes from 70 to 75.

In 1 patient there was considered to be a normal leucocyte count. Total 7,187. (This was done late in the disease. Case No. IV.)

<i>Differential.</i> —Polymorphs . . .	61.5 per cent.
Lymphocytes. . .	33.5 „
Mononuclears. . .	4.5 „
Eosinophils . . .	0.5 „

BRITISH JOURNAL OF VENEREAL DISEASES

The question of the Wassermann reaction, which was positive in 14 out of 37 patients examined, has already been discussed in some detail.

The tonsils were noted to be enlarged in 4 patients, and follicles were seen containing secretion in 5 patients, including 1 cervical adenitis case.

The tongue was noted to be dry and coated in 4 only of the cases.

In 2 cases only was there any abnormality of the heart noted. In 1 patient with a temperature the beat was noted to be "thumping" in character, and in another the rhythm was tic-tac.

There was a degree of bronchitis in 5 patients, in 1 of whom tuberculosis was suspected, but not proved bacteriologically, and radiographic examination of the chest in this patient showed general peribronchial fibrosis and a suspicious area of early infiltration near the left hilum.

The question of skin lesions has already been dealt with. There were 13 patients with active skin lesions and scars in 4 others, and in 7 others a history of skin disease or injury. In 38 cases there were no cutaneous affections, but in 7 of these the earlier stages of the disease were spent elsewhere, and there is a possibility of skin trouble having been present but not noted.

With the exception of feeling external iliac glands in 15 patients the abdominal examination was remarkable for the few abnormal features disclosed. In 1 case there was epigastric tenderness, and in 1 other a slightly enlarged liver, but otherwise the findings were completely negative.

The urine examination, as a rule, was negative, but in 2 cases microscopic examination revealed a few pus cells, and in 3 cases, including 1 of the above, there was a trace of albumin.

There was noted to be a more or less general adenitis in 4 cases, and in 5 other cases one other group of glands was enlarged. In 1 case the left posterior triangle was the group affected, and in 2 cases axillary glands. In 2 cases a very slight enlargement of the opposite inguinal glands was noted; this was not considered enough to include this under the heading of a double inguinal bubo.

Rectal examination was latterly done as part of the routine examination of the patients; 36 patients were

THE "NON-VENEREAL" OR CLIMATIC BUBO

so examined. The results were negative in 5, but some abnormality was noted in 31 patients. In 6 patients the right lobe of the prostate or the right seminal vesicle was affected. In 1 patient the right lobe of the prostate was enlarged, in 2 patients the right seminal vesicles were tender, and in 3 patients the right side of the prostate or the right seminal vesicle was enlarged and tender.

In 22 patients the left side of the prostate or the left seminal vesicle was affected. In 9 patients one or other of these organs was enlarged; in 6 one or other was tender, and in 7 one or other was enlarged and tender.

In 3 patients both sides were affected. In 1 of these the prostate was enlarged both sides, in another it was enlarged on both sides and tender on the left side, and in a third case both seminal vesicles were enlarged and tender (the left side being most affected).

Remembering that lymph from the seminal vesicles drains mainly to the external iliac glands, and that from the prostate drains largely to these glands, it is interesting to note that of the 15 patients in whom enlarged external iliac glands were noted, a rectal examination was done in 11 cases.

(1) In 1 of these the prostate and vesicles appeared normal.

(2) In 1 patient in whom the right external iliac glands were enlarged, the right seminal vesicle and right lobe of the prostate were enlarged and tender.

(3) In 8 patients the left seminal vesicle was noted to be enlarged, and in most cases tender. Of these, the external iliac glands swelling was noted to be bilateral in 1 case and on the left side in the remainder.

(4) In the remaining patient both sides of the prostate were noted to be enlarged; in this patient the left external iliac glands were again involved.

In 3 patients only was the prostatic fluid found to contain pus cells; in 1 of these Gram-negative extra-cellular organisms were also demonstrated.

(8) THE DIFFERENTIAL DIAGNOSIS OF NON-VENEREAL BUBO

This has to be made from a number of other conditions which may give rise to enlarged inguinal glands. Among the most important are the following :—

BRITISH JOURNAL OF VENEREAL DISEASES

Granuloma venereum.	(Granuloma pudendi).
Plague.	Scabies.
Filariasis.	Pediculosis pubis.
Tuberculosis.	Tinea cruris (Dhobie itch).
Syphilis	Ferunculosis (especially over the sacrum).
Ulcus molle (soft sore).	Purulent balanitis.
Gonorrhœa.	Herpes genitalis.

GRANULOMA VENEREUM (GRANULOMA PUDENDI)

This disease, characterised by venereally acquired ulcers which contain Donovan bodies, and common among certain native races in tropical countries, was considered by Clément²⁹ to have some relation to the climatic bubo. At first glance there was something to be said for it, seeing that in many cases the buboes followed sexual intercourse with native women, who might well have been infected with granuloma venereum.

There is, however, in literature no evidence of any such relationship, and no case has been described of any primary ulcer containing Donovan bodies, nor has any evidence been forthcoming of Donovan bodies being found in excised glands or sinuses in cases of non-venereal bubo (Favre,⁴⁶ Fischl³⁴).

PLAGUE

One of the many synonyms of the non-venereal bubo is "pestis minor," which infers some causal relationship with plague. The name is a bad one, however, as clinically and bacteriologically there is no evidence of this relationship.

In non-venereal bubo, as a rule, there are but slight constitutional symptoms, and the disease is practically non-fatal; in this respect it might be said to be akin to plague in the same way as variola minor is to variola major at the present time. The parallel is not, however, complete, for in variola minor, though the symptoms are mild, yet the infectivity is probably as great as that of its more serious kindred disease; but in the case of non-venereal bubo (pestis minor) there is no risk of infection or contagion as far as can be ascertained, and in this respect it differs completely from plague.

Further, gland puncture (for *B. pestis*) is a diagnostic proceeding of considerable importance in plague, yet in

THE "NON-VENEREAL" OR CLIMATIC BUBO

no case of non-venereal bubo has *B. pestis* ever been isolated from punctured or excised glands.

FILARIASIS

In this affection a condition of "varicose groin glands" sometimes occurs.⁴⁷ In situation the swellings are found in a similar position as are the swellings of climatic bubo; on palpation, however, the swellings are soft, doughy and obscurely lobulated; they are not adherent to the skin, which is natural in appearance over them. They are, however, adherent to the subjacent fascia. In the case of climatic bubo in glands which are broken down sufficiently to be soft, the consistency is completely different and the skin is usually involved and altered in colour, elasticity, etc. The diagnosis is completed by puncturing the gland swellings; in the case of varicose groin glands the fluid withdrawn is white or reddish or clear fluid and contains tiny micro-filariases instead of the more or less thick grumous pus which is obtained from the climatic bubo.

TUBERCULOSIS

"Strumous bubo" is another of the terms applied to the non-venereal bubo. This implies a relationship to tuberculosis, and Violato²⁶ described a case in which he excised the glands and microscopical examination of these showed that the pus cells were mononuclear rather than polynuclear; no organisms were seen and cultures were negative. He considered that the tubercle bacillus was possibly the cause of the condition in this case.

While it is not denied that tuberculosis may affect the inguinal glands, it is improbable that it is the infecting agent in the non-venereal bubo. The case quoted above is by no means conclusive, and no instances of the discovery of the tubercle bacillus or even of giant-cell systems in sections of excised glands have been discovered in the literature consulted. The characteristics of the glands excised are those of a sub-acute inflammation, and no caseating glands have either been seen or reported.

SYPHILIS

Most observers report a negative Wassermann reaction in their cases of non-venereal bubo, and no cases of excised

BRITISH JOURNAL OF VENEREAL DISEASES

glands have shown any evidence of giant-celled systems, unless the "Stellar" abscess system of De Bellard and Uribe³³ is considered to be of this nature. Hashimoto,³⁷ however, reported 4 cases in Japan, in whom the Wassermann reaction was positive, although there was no evidence of syphilis, and Fischl³⁴ found in some of his cases a "contaminating" spirochæte in the lesions.

In my series the Wassermann reaction was positive in 14 out of 37 patients examined, and, as has been pointed out elsewhere, in none of these patients was syphilis considered to be the cause of these buboes. In arriving at these conclusions, due weight was given to the following considerations.

(1) In over 90 per cent. of the cases the glands were matted together, and in 75 per cent. they were suppurating.

(2) When blood counts were done there was frequently a mild polynuclear leucocytosis.

(3) There was a general absence of other common signs of syphilis. In 4 cases, however, there was a more or less general adenitis—in only one of these was the Wassermann reaction weakly positive.

SOFT SORE (ULCUS MOLLE)

Koppel³⁵ inferred a causal relationship between *ulcus molle* and lymphogranuloma inguinale (non-venereal bubo), pointing out the similarity of the nodes, and that in Breslau, coincident with a decrease in the number of patients suffering from *ulcus molle*, there was an increase in the number suffering from lymphogranuloma inguinale.

Hanschell¹⁰ found no constant histological differences in sections of excised climatic bubo glands from those seen in inflamed glands excised from patients suffering from scabies or *ulcus molle*.

Clinically, however, in *ulcus molle*, the sore appears two or three days after exposure to infection, and the glands if they swell up in about seven to fourteen days from the date of infection. Günther¹⁴ points out that in climatic bubo there is an incubation period of three to eight weeks from the date of exposure to infection before the glands swell up. This I can confirm from those

THE "NON-VENEREAL" OR CLIMATIC BUBO

of my patients who gave a positive history of recent sexual intercourse; in 10 out of 12 patients the glands appeared between one and two months after sexual intercourse; in the remaining cases fourteen days and twenty-one days had elapsed before the glands started to swell. In the 3 cases in which small ulcers appeared on the glans penis the time of the appearance of the ulcers was five to eight weeks after exposure to infection.

Frei²² has obtained specific dermal reactions, both for *ulcus molle* and climatic bubo, each reaction specific for its own disease only. This has been confirmed by Fischer¹² and Hellerstroem²¹ for climatic bubo reactions.

GONORRHOEA

The relationship of gonorrhœa to the non-venereal bubo is perhaps more difficult than any other disease; most authors state that their patients had no venereal history, and from this consider that the patients had not had gonorrhœa. A number of my patients stated that they had had no venereal history, but on further questioning, if they had ever had gonorrhœa, admitted that they had. In 28 cases in which this disease was specifically investigated, 11 patients had a positive history of gonorrhœa. This question has been entered into in some detail under the heading of ætiology, and the conclusion arrived at was that a urethra which has become infected with contaminating organisms after recurrent or incompletely cured attacks of gonorrhœa is likely to be a cause of adenitis in a certain proportion of cases.

SCABIES, ETC.

Scabies, pediculosis pubis, *tinea cruris* (Dhobie itch), furunculosis (especially of sacrum), purulent balanitis and herpes genitalis may, any or all of them, produce a sub-acute infection of the inguinal glands, clinically and pathologically indistinguishable from the non-venereal bubo.

Usually in these cases the source of infection is obvious or easily discovered from the history and characteristic nature of the scars.

LIST OF REFERENCES

- (1) ROBINSON: Cunningham's "Anatomy," 1917, p. 1013.
- (2) GRAY'S "Anatomy," 24th Edition, 1930, pp. 811 *et seq.*

BRITISH JOURNAL OF VENEREAL DISEASES

- (3) BUCHANAN'S "Manual of Anatomy," 5th Edition, 1925, p. 721.
- (4) HOME, W. E.: *Jour. Roy. Nav. Med. Serv.*, July, 1926, p. 210.
- (5) LOW, G. C., and COOKE, W. E.: *Jour. of State Medicine*, August, 1926, Vol. **34**, pp. 450-463.
- (6) NICHOLAS, J., FAVRE, M., and DURAND: *Soc. Méd. Hôp. Paris*, January 31st, 1913, p. 274.
- (7) CHASTANG: *Arch. Med. et Pharm. Nav.*, May-June, 1922, Vol. **112**, No. 3, pp. 195-202; *Sum. Trop. Dis. Bull.*, January, 1923.
- (8) GAMNA, C.: *Presse Méd.*, May, 1924, No. 37, p. 404.
- (9) FAVRE, M.: *Presse Méd.*, August, 1924, No. 62, p. 651.
- (10) HANSCHHELL, H. M.: *Lancet* (London), August 7th, 1926, p. 276.
- (11) FREI, W., and HOFFMANN, H.: *Arch. für Dermat. u. Syph.*, April 23rd, 1927, Vol. **153**, No. 1, pp. 179-199; *Sum. Trop. Dis. Bull.*, January, 1928.
- (12) FISCHER, O.: *Klin. Woch.*, February 5th, 1928, Vol. **7**, No. 6, pp. 255-256; *Sum. Trop. Dis. Bull.*, August, 1928; *Archiv. für Schiff. u. Trop. Hyg.*, February, 1928, Vol. **32**, No. 2, pp. 91-92.
- (13) "Statistical Report of the Health of the Navy for 1927," Admiralty, February, 1929, p. 114.
- (14) GÜNTHER, R.: *Arch. für Schiff. u. Trop. Hyg.*, October 15th, 1925, Vol. **29**, No. 10, pp. 546-554; *Sum. Trop. Dis. Bull.*, June, 1926.
- (15) RAVANT, P., and SHEIKEVITCH: *Bull. et Mém. Soc. Méd. Hôp. de Paris*, March 10th, 1921, Ser. 3, Vol. **45**, No. 8, pp. 310-312; *Sum. Trop. Dis. Bull.*, November, 1921.
- (16) PASSE, E. R. GARNETT: Private Letter, March, 1930.
- (17) MANSON BAHR, P. H.: Manson's "Tropical Diseases," 1929 Edition, p. 659.
- (18) MÜLLER, O., and JUSTI, K.: *Arch. für Schiff. u. Trop. Hyg.*, December, 1914, Vol. **18**, Beheft 8, p. 32; *Sum. Trop. Dis. Bull.*, June, 1924.
- (19) TREIBLY, C. E.: *U.S. Naval Med. Bull.*, October, 1916, Vol. **10**, No. 4, pp. 661-663; *Sum. Trop. Dis. Bull.*, March, 1917.
- (20) WILMOTT, C. L.: *Southern Med. Journal*, February, 1928, Vol. **21**, No. 2, pp. 108-113; *Sum. Trop. Dis. Bull.*, August, 1928.
- (21) HELLERSTROEM, S.: *C. R. Soc. Biol.*, October 28th, 1927, Vol. **97**, No. 28, pp. 1168-1170; *Sum. Trop. Dis. Bull.*, August, 1928.
- (22) FREI, W.: *Klin. Woch.*, October 22nd, 1927, Vol. **6**, No. 43, pp. 2042-2044; *Sum. Trop. Dis. Bull.*, August, 1928.
- (23) HANSCHHELL, H. M.: *Brit. Jour. of Ven. Dis.*, July, 1927, Vol. **13**, No. 3, pp. 244-246.
- (24) PIGEON, E., and LE BOURDELLES, A. C. B.: *Arch. Med. et Pharm. Milit.*, December, 1924, Year 31, Vol. 1, No. 6, pp. 776-783; *Sum. Trop. Dis. Bull.*, August, 1925.
- (25) VERDELET and AUCHÉ, J.: *Jour. Méd. de Bordeaux*, October 10th, 1926, Vol. **103**, No. 17, pp. 739-740; *Sum. Trop. Dis. Bull.*, April, 1927.
- (26) VIOLATO, A.: *Ann. di Med. Nav. e Colon*, November and December, 1924, Year 30, Vol. **2**, Nos. 5 and 6, pp. 259-275; *Sum. Trop. Dis. Bull.*, August, 1925.
- (27) BOUFFARD: *Ann. di Med. e di Pharm. Colon*, October-December, 1926, Vol. **24**, No. 4, pp. 563-567; *Sum. Trop. Dis. Bull.*, January, 1928.
- (28) VIRGILLO, FRANCESCO: *Ann. di Med. Nav. e Colon*, January-

THE "NON-VENEREAL" OR CLIMATIC BUBO

February, 1925, Vol. 1, No. 122, pp. 1-16; *Sum. Trop. Dis. Bull.*, August, 1925.

(29) CLÉMENT: *Presse Méd.*, November 13th, 1926, Vol. 34, No. 91, pp. 1429-1431; *Sum. Trop. Dis. Bull.*, 1927.

(30) RAVANT, P.: *Bull. et Mém. Soc. Méd. Hôp. de Paris*, June 16th, 1921, No. 20, pp. 865-874; *Sum. Trop. Dis. Bull.*, November, 1921.

(31) VIRGILLO, FRANCESCO: *Ann. di Med. Nav. e Colon*, May-June, 1925, Year 31, Vol. 1, Nos. 5 and 6, pp. 268-271; *Sum. Trop. Dis. Bull.*, December, 1925.

(32) TODD, A. T.: *Lancet* (London), October 2nd, 1926, pp. 700-702.

(33) DE BELLARD, E. P., e URIBE, C.: *Trabazo Presentato ad IV Congresso Venezolano de medicina Caracas*, 1925; *Sum. Trop. Dis. Bull.*, June, 1926.

(34) FISCHL, F.: *Seuchen Bekämpfung Vienna*, 1929, Vol. 6, No. 2, pp. 104-110; *Sum. Trop. Dis. Bull.*, March, 1929.

(35) KOPPEL, A.: *Klin. Woch.*, December 24th, 1927, Vol. 6, No. 52, pp. 2469-2470; *Sum. Trop. Dis. Bull.*, August, 1928.

(36) DESTEPHANA, F., and VACCAREZZA, R. F.: *Semana Medica*, October 22nd, 1925, Vol. 32, No. 43, pp. 1043-1052; *Sum. Trop. Dis. Bull.*, March, 1926.

(37) HASHIMOTO, T.: *Japan Journ. Dermat. and Urol.*, March, 1926 (German Summary), Vol. 26, No. 3, pp. 179-196; *Sum. Trop. Dis. Bull.*, December, 1926.

(38) SEI, S.: *Arch. für Schiff. u. Trop. Hyg.*, April, 1923, Vol. 27, No. 3, pp. 81-93; *Sum. Trop. Dis. Bull.*, June, 1923.

(39) NICHOLAS, J., LEBEUF, F., and ROUSSET, J.: *Bull. Soc. Française Dermat. et Syph.*, April, 1929, No. 4, pp. 720-722; *Sum. Trop. Dis. Bull.*, October, 1929.

(40) DELBET, P.: *Bull. Acad. Med.*, April 5th, 1927, Vol. 97, No. 14, pp. 453-457; *Sum. Trop. Dis. Bull.*, January, 1928.

(41) PARDO CASTELLO, V.: *Arch. Dermat. and Syph.*, July, 1926, Vol. 14, No. 1, pp. 35-43; *Sum. Trop. Dis. Bull.*, December, 1926.

(42) HILLSMAN, J. A., WILSHUSSEN, H. F., u. ZIMMERMAN, H. M.: *Arch. Dermat. u. Syph.*, September, 1928, Vol. 18, No. 3, pp. 383 et seq.; *Sum. Trop. Dis. Bull.*, March, 1929.

(43) DESTEPHANA, F., and VACCAREZZA, R. F.: *Presse Méd.*, November 12th, 1927, Vol. 35, No. 91, pp. 1378-1379; *Sum. Trop. Dis. Bull.*, August, 1928.

(44) NICHOLAS, J., FAVRE, M., LEBEUF, F.: *Bull. Soc. Française Dermat. et Syph.*, April 4th, 1929, pp. 287-288; *Sum. Trop. Dis. Bull.*, October, 1929.

(45) DUFF, D.: *West African Med. Journ. Lagos*, January, 1928, Vol. 1, No. 3, p. 42; *Sum. Trop. Dis. Bull.*, August, 1928.

(46) FAVRE, M.: *Presse Méd.*, January 26th, 1927, Vol. 35, No. 8, pp. 117-118; *Sum. Trop. Dis. Bull.*, January, 1928.

(47) MANSON BAHR, P. H.: Manson's "Tropical Diseases," 1925, p. 521.

(To be continued.)