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SYPHILIS IN UGANDA
(The History, Clinical Features and Cellular Immunity)

A Dissertation For the Degree of Masters of Medicine (Med), Makerere University Kampala.

By

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Masters of Medicine (Makerere Kampala) promotes not only clinical experience but also interest in research and scientific work.

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Aaron E.J. Masawe
SUMMARY

The history of syphilis in Uganda, the clinical patterns, and the cellular immune mechanisms among the indigenous subjects with syphilis have been studied.

Concerning the history it was shown and discussed that the disease was unknown in this country until the arrival of the Arab Slave Traders in 1848. After 1880 the disease rampaged the country "in epidemic fashion" and necessitated the setting up of the anti-venereal disease campaign that has lived until today and which underlined the foundation of Medical Services and higher medical education in this country. The predisposing factors for the so-called syphilis epidemic included: (a) the announcement by Kabaka that venereal diseases were virtuous and every man had to acquire to remain a man, and (b) the religious wars between different religious factions.

Of the clinical pattern, it was deduced both from the historical review and from the study that lesions of syphilis amongst the indigenous population are severe and exuberant in the early stages of the disease and somehow puzzling in the late stages.
In the primary stage, the chancres are usually multiple, confluent and phagaeformic. The secondary lesions are mainly condylomatosus and annular (40% in males and 57% in females), and sometimes grossly ulcerative (33% in males and 50% in females). In the tertiary stage, both cardiovascular and general paresis of insane (GPI) are common, but Tabes dorsalis and Angyl-Robertson pupillary changes rarely occur. Dense mononuclear cell infiltrate in histological material from late syphilis is also very rarely seen.

Cellular immunity is probably the basis for the above clinical findings. To evaluate this, delayed hypersensitivity skin tests were performed on 25 controlled patients using several common skin antigens and it was found that cellular immunity amongst the indigenous subjects with early syphilis is maintained and probably overactive. All the patients tested (100%) were positive. It has been argued out in the discussion that the hyperactivity of the cellular immunity is responsible for the unusual nature of syphilis in Uganda and probably the whole of the tropical world.

It has been postulated that the body employs a feed back control system to moderate cellular immune reactions, and that the rarity of mononuclear cell infiltrate is a consequence of imbalance in favour of the moderator system.
SECTION I

INTRODUCTION

Syphilis is an important disease in the history of Medicine and Health Services in Uganda and indeed East Africa as a whole. It was upon the endeavours to overcome venereal diseases that Mulago Hospital, Makerere University Medical School and higher medical education in East Africa were founded early this century.

Syphilis is also a disease of tremendous historical and clinical interest. It was probably brought to Uganda for the first time in 1850's by the early Arab Slave Traders and became endemic in Buganda whence it spread to the other regions enclosed by the great lakes (Fig. I). By the beginning of the present century its scourges had reached overwhelming and threatening proportions and a leading article in the Lancet 1908 reported that the entire local population was in danger of extermination if nothing was done. Alarming as it sounds, the early pioneers of Medicine in Uganda also noted that about 30% of the people in Buganda had had syphilis at one time or another (Cook 1936) and that
the antenatal mortality was 67% among pregnant women because of syphilis. (Lambkin 1908)

The clinico-pathological manifestations of both early and late syphilis have hitherto been puzzling and in many respects different from those encountered among caucasian patients. The early forms are more severe and more exuberant and the late forms are precocious, rapidly progressive and lacking in certain classical entities such as Tabes dorsalis and Argyll-Robertson pupils. Several explanations have been advanced for these differences but none has stood the test of time. Davies (1956) argued that many of the so-called syphilitics were not true venereal syphilis+ but Yaws and endemic syphilis.* Hudson (1958) postulated that the dermal manifestations of the treponematoses were severe in the tropics and subtropics because the local population walked naked in highly humid and wetty environment. MacArthur 1923 attributed the rarity of late visceral syphilis amongst the South African Bantus to lack of mental strain and worries of Western civilization!

* Endemic Syphilis — Acquired endemically by non-sexual routes.
+ Venereal Syphilis (Briefly termed syphilis) — Acquired sporadically and via sexual routes (Guthe 1969).
Obviously these explanations are not satisfactory. Yaws is almost completely eradicated from this country; nakedness has disappeared with time and mental and physical strains are problems everywhere. Yet the lesions of Syphilis amongst our indigenous population continue to remain gross, severe and atypical. What then is the explanation? Could it be immunological? In the past few decades the knowledge of immunology has considerably increased and it has become increasingly recognised that immunological reactions (cellular and humoral) play a considerable role in numerous biological phenomena and also in the pathogenesis of several disease processes. Soluble antigen-antibody complexes for example are known to cause nephrotic syndrome (Dickson 1968) and cellular immunity is thought to be responsible for a variety of disease processes including transplant rejection; defence against neoplastic growth, tissue reactions in certain bacterial, viral, mycotic and parasitic infections, and autoimmune processes (WHO Tech. Rep. Series 1969, Allison 1967).

The manifestations of syphilis are basically immunological but hardly any information is available regarding the role of cellular immunity in this disease.
Levine et al 1969 reported that cell mediated immunity in early infectious syphilis (Primary and secondary) was impaired but this work has never been repeated.

This dissertation puts forward evidence to suggest that the lesions of syphilis are basically due to cell mediated immunity (delayed hypersensitivity) and that they are different amongst the local population because of hyperactive cellular immune mechanisms. In addition the history of syphilis in Uganda is reviewed and the present day clinical characteristics in patients with early stages of syphilis seen at the venereal disease (VD) clinic attached to Mulago Hospital are defined.
Fig. 1: Shows how syphilis imported around 1850 spread from Kampala to other areas. The map depicts the situation around 1930-1940.
Fig. II: Graphic representation of the Distribution of Syphilis and Yaws in 1934-1939. Fig. I was drawn from such information.
SECTION II

HISTORICAL REVIEW

Geographical Account and Syphilis Before 1900:

Uganda is a state of about 2,357,000 sq. kilometers and 9.5 million people, lying on the inland plateau of East and Central Africa between latitudes 1°S and 4°N and Longitudes 30° - 35°E and boardered by Kenya on the East, Sudan in the North, Congo Kinshasa on the West and by Tanzania and Rwanda in the South.

Up to 1848 this country was completely unknown to the rest of the World. The Sahara desert and the Nile Swamps in the North, the impenetrable forests in the West and the bellicose Masai and Karamojong Worriors in the East barred every attempt by foreigners to penetrate into the interior from the Coast.

However, the Southern border was less guarded and provided the route of entry for the early foreign invasion. The first foreigner to set foot on Uganda soil was a half breed Arab Soldier, Amin bin Saim, who reached the Court of Kabaka Suna from Korogwe (Tanganyika to be) in 1848 (Fig.I).
Soon after him, other Arabs and Europeans (Explorers as well as Missionaries) followed and by 1880 a multitude of them were present in Uganda (Marsh & Kingsworth 1966).

The Arabs were essentially traders and imported several goods, including guns, ammunitions, cloths and jewelleries, in exchange for slaves and ivory. They also imported syphilis and gonorrhoea which they spread in Kabaka's Court, but both diseases remained confined in the Court until about 1880. The strict tribal customs then practiced kept every woman under close supervision and ruthlessly punished every form of unchastity, hence the diseases did not spread.

From 1884, however, two serious misfortunes befell the Kingdom of Buganda. The reigning monarch namely the young mischievous Mwanga, contracted gonorrhoea (and possibly syphilis) (Kibukamusoke 1965) and without concern proclaimed it a disease of nobility; a disease that every male should acquire to be a man. The King's words were supreme and his instructions were gospel so that following the pronouncement every male within and around Buganda strove for a dose. Sooner or later the disease was everywhere and almost every subject
in the Kingdom was infected. The second misfortune was that, late in the 1880's a series of wars broke out in Buganda between rivaling religious groups (Mohamedans and Christians versus the Monarch and his followers in 1888, then the Christians against the Arab-Muslim group in 1889 to 1890 and finally the Roman Catholics versus the Protestants in 1892). These struggles left the country utterly impoverished, desolated and disease-striken.

From an analysis of carefully kept records at the Church Missionary Society (CMS) Hospital at Mengo from 1897-1901, Sir Albert Cook (1901) estimated that about 80% of outpatient cases had had syphilis at one time or another and that 10.5% of medical admissions were of venereal origin. Moffat (1901) likewise denoted a high prevalence of syphilis and other venereal diseases amongst the military personnel of indigenous origin.

**Colonel Lambkin (R.A.M.C.) and the Anti-VD Campaign**

By 1906 the situation was much worse and the Commissioner of the Protectorate without hesitation requested for help from the Secretary of State. The request was quickly met and Colonel Lambkin of the Royal Army Medical Corps, a leading British Venereologist of the time, was appointed to investigate,
assess the prevalence and concert measures of prevention. He arrived in 1907, studied the local conditions and in 1908 submitted his report. In his report Lambkin observed that over 50% of Baganda were affected with syphilis; that in some parts of the country such as Ankole upto 90% of the people were affected with the same disease and that the infant mortality rate was 50 - 60% because of syphilis. He also reported that the indigenous population was in danger of extermination if nothing was done. Accordingly a commission of three medical officers: Colonel Sparkes, Captain Keane (later Major Keane) and Lieut. Traves was sent to implement Lambkin's recommendations. They arrived in the same year (1908) and established their centre of operation at Old Kampala Hill, but four years later (1912) they moved the Centre to Mulago Hill. This centre gradually grew into the present day Mulago Hospital and Makerere University Medical School. In the first four years other sub-stations were also set up at Masaka and Busimbi near Mityana and these have likewise grown into bigger hospitals.
The first few years were extremely difficult and discouraging. Drugs were limited, transport was poor, the local population was abnormally hypersensitive to mercurial compounds and the first world war brought operations to a complete standstill. Nevertheless, little by little things improved as years went by.

**Changing Pattern**

The early clinical report by Cook (1901) Lambkin (1908) Kean (1912) Leslie & Web (1927) suggested that up to 1930 late visceral lesions of syphilis were very rare, although the early forms and congenital syphilis were very common.

Around 1930 the pattern changed and an increasing number of late syphilis were seen both in clinical practice and at autopsy. In the late 1930s syphilis accounted for more than 50% of heart diseases in life and 10% of all autopsy hearts (Williams 1938), whereas congenital syphilis accounted for only 5% of paediatric admissions to Mulago Hospital. (Muwazi et al 1944)

**Antibiotic Era:**

Around 1946-47 Penicillin became available for clinical use in Uganda and another change took place. The number of syphilis cases reported declined thereafter. In cardiovascular practice in Mulago
Hospital the number dropped from 27% of cardiac admissions in 1952 (Williams et al 1952) to 12% in 1957 (Shaper & Shaper 1958), 6% in 1965 (D'Arbela et al 1965) and finally 4% (Somers et al 1970). Patients with neurosyphilis also dropped; from 22% in 1955 (Hutton 1955) to 8% in 1957 (Shaper & Shaper 1958) and finally 4% today (Billinghurst 1970). However, as regards neurosyphilis caution must be exercised because in 1955 Etabika Mental Hospital was opened and all cases of neurosyphilitic psychosis were thereafter admitted to this hospital instead of Mulago. About 10.5% of all first admissions to this hospital are due to syphilis (German et al 1970).

For early syphilis very little information is available about its pattern over the past 40 years. Nevertheless from Annual Medical Reports, it is reported that with the availability of penicillin the numbers declined. In addition Kibukamusoke (1965) studied patients with VD attending Mulago Hospital and reported that 0.4% were suffering from early syphilis. However according to the present day information the disease is more common than suggested (infra vide).
Clinical Spectrum:

Since the earliest days of Sir Albert Cook in Uganda (1897) up to today the clinical spectrum of syphilis in Uganda has been more severe in Africans than in a comparable Caucasian group. Lambkin in his report in 1938 described the disease as follows:

"In primary stage the Hunterian chancre is the rule but it often takes a phagocytic character and produces wide destructions of the surrounding parts. The secondary stage is characterised by intense and confluent eruptions, ulcerations of the mucous membranes, laryngitis, iritis, periostitis, arthritis, profound anaemia, cachexia and general disturbance of nutrition".

Kean (1912) & Loewenthal (1939) likewise observed that the lesions were severe. Loewenthal described the disease as having "rapid succession of various stages." The primary sore often coexisted with chancroid and were in many respects multiple, sub-prepuccial and associated with inflammatory phimosis. He also observed that secondary eruptions were florid and exuberant. Multiple condylomata were very common especially in the perineal and axillary regions. Annular papular syphilitide were also common.
Concerning tertiary syphilis, the descriptions indicated that the onset was precipitous and stormy; that the mean age of onset was 40-45 years, 10 years younger than comparable European figures, and that the natural course was rapid and often fatal. Death ensued six months to two years after the first hospitalization, (Williams 1938; Muwazi et al 1944; Davies 1947; Hutton 1955).

In cardiovascular syphilis the main features were those of aortic regurgitation. From a series of 53 patients with syphilitic heart disease, Williams (1938) found that aortic regurgitation was present in 33 patients; aneurysm of aorta and great vessels was present in 17 patients and coronary ostia stenosis was present in 13. Eleven patients had both the aneurysm and the aortic regurgitation, four had both coronary ostia stenosis and regurgitation, and one had both coronary ostia stenosis and aneurysm.

General paralysis of the insane (G.P.I.) with dementia constituted the commonest form of neurosyphilis seen (Muwazi et al 1944, Hutton 1955). From a series of 190 cases of neurosyphilis autopsied at Mulago from
1931-1946, Davies found that 96 patients had died of GPI, 38 of meningeovascular syphilis, five of pachymeningitis haemorrhagica, three of transverse myelitis and in 48 there were no sufficient details. Tabes dorsalis was not reported in this series.

Concerning eye complications, there is no information available but from colleagues in the Eye department optic atrophy and chorioretinitis are fairly common. On the other hand typical Argyl-Robertson pupils are very rarely seen.

**Treatment, Response and Idiosyncrasy:**

Throughout the century, various treatment schedules including mercurial compounds, potassium chloride, Arsenical and Bismuth salts, and finally penicillin have been employed and each has been reported to have had remarkable therapeutic effects. Lesions in early syphilis cleared after one or two injections. However as already cited most of the patients given mercurial compounds early this century developed adverse reactions. Cook 1901, Lambkin 1908, Keane 1912 and Loewenthal 1939 reported that the local population was so sensitive to mercurial compounds that even the smallest doses were sufficient to trigger off severe hypersalivation and dermatological reactions. Cook then postulated that
this idiosyncrasy was caused by increased acquired
immunity following several and repeated attacks
of malaria (Cook 1929, 1936).

Yaws versus syphilis!: (Fig. II)

Cook observed in 1901 that whereas syphilis
and yaws were both endemic in many parts of the
country, yaws was surprisingly rare amongst the
Baganda. Other subsequent reports corroborated
this statement, but Davies 1956 denied the
validity of these reports and stated that there
had been a lot of misinterpretations of lesions.
He argued that the descriptions of syphilis by
early pioneers were not at great variance with
the descriptions of yaws by Hackett in Lango
District in 1946.

Today yaws is gone from clinical practice
and hence it is difficult to tell where the truth
lay. However, for purposes of subsequent discussions
it is important to realise that yaws as described
by Hackett 1946, was mainly a disease of childhood
(85 - 90% of the cases were below 15 years of age).
The primary lesions were infrequently seen and the
secondary eruptions were exuberant, granulomatous
and scattered all over the body. The tertiary
lesions consisted of either extensive superficial
ulcers with a tendency to heal at the centre and spread at the edges or localised indolent ulcers with coarse irregular base which healed with trophic scarring and hypopigmentation. Neurological and cardiovascular sequellae were never seen. The lesions were less severe in malnourished children and spleen as well as epitrochlear lymphnodes were palpable in 80-90% cases.

**Comment on the Historical Review:**

The preceding review more or less confirms that the history of syphilis in Uganda is not more than probably a century old. It also establishes as a matter of fact that the legendary stories associating the Arabs and the importation of syphilis into the country are probably genuine.

Dr. David Livingstone, the first Medical Explorer to Central Africa noted in one of his memos in 1857 that throughout his travels in Central Africa he never encountered a single case of syphilis and he presumed the disease could not maintain itself permanently in pure blooded Africans; Apolo Kagwa (1935) a distinguished writer in the history of Buganda, observed that venereal diseases were unknown in this country until the arrival of Arabs in 1848, and Moffat (1901) as well as Lambkin (1908).
submitted that syphilis was rampant because it had been implanted on a virgin land.

Naturally, syphilis takes about 10-20 years to develop tertiary lesion and as such the fact that late visceral lesions were rarely seen until 1920-1930 strongly supports the argument that the disease had never existed in the country for long before. Of course there are other possibilities such as lack of diagnostic facilities, insufficient awareness of the condition and misdiagnosis. It seems unlikely, however, that careful observers like Cook and Lambkin, could have missed such cases.

Davies 1956 could not share the belief that syphilis was imported into the country in the recent past, and thus supposed that an endemic form of syphilis existed in the country for centuries but was replaced by the venereal form early this century. Unfortunately he did not explain how and when the change precisely took place, nor did he seem to pay sufficient attention to events which took place in Buganda from 1880 - 1900, and which were so favourable for the spread of syphilis as already suggested.
Turning to the clinical side there is no doubt from the foregone data that lesions of syphilis amongst the indigenous population were extensive, exuberant and mutilating in the early infectious stages and either lacking (Tabes dorsalis) or rapidly progressive and fatal in case of late tertiary stages.

One has to be careful about the statistics cited by our predecessors. In a majority of them the estimates were probably highly selected or exaggerated. However, whatever the nihilism, there is no doubt that the disease has posed tremendous problems in this country.

A further puzzle as far as late syphilis amongst the local population is concerned is the rarity of cellular reaction in pathological material. The pathognomonic histological features of late syphilis (Ref. p[age]) are very rarely seen in most such patients autopsied at Mulago. In a histological review of Brain sections collected from 63 autopsies done at Mulago from 1964-1970 on patients with both obvious ante-mortem (clinical) and post-mortem gross macroscopic evidence of GRI (cerebral atrophy, flattening of gyri and thickening of meninges), Thomas (1970) detected diagnostic Lymphocytes and Plasma cell infiltrate in only 13 patients. Steiner (1969)
studying aortopathies in Mulago Hospital likewise noticed slight cellular reaction in most cases dying of syphilitic aortitis. Furthermore in a well documented and proven case of late syphilis (Clinical, serological and Gross-P.M. findings), Masawe (1970) found hardly any mononuclear cell infiltrate in both the Aortic and brain tissue. The Aortic Section is shown (Fig. IIIa) alongside another section with pathognomonic features (Fig. IIIb).

Apparently most of the reviewed reports appear exaggerated and unbelievable. It is hard to imagine a population with 80% syphilitics. Almost invariably many of these reports were very selected and biased. Limited diagnostic facilities also meant that most of these investigations were based on clinical impressions. However, nihilistic as one may be, there is no doubt that syphilis has been a major problem in this country, and that these investigators have done a splendid piece of work.
Fig. IIIa - 2 **ATYPICAL SYPHILITIC AORTITIS:**

A high power view (x 180) of the adventitial side of aortic wall. There are blood vessels amidst collagen fibres but hardly any cellular reaction around the blood vessels. H.E. stain.

Fig. IIIa - 1 shows a low power view (x 42) of the same section.
TYPICAL SYPHILITIC AORTITIS

Thoracic aorta showing intimal thickening and inflammatory cell infiltrate mainly around capillaries both in the Media and the adventitia. H & E x 31.
Fig. III-2  TYPICAL SYPHILITIC AORTITIS

Adventitia of thoracic aorta showing marked inflammatory cell infiltrate. H & E x 180.
SECTION III

THE STUDY:

Briefly the aims of the study were:

a) To check whether the clinical manifestations of early infectious syphilis presently seen at the VD clinic concur with those reviewed in section II.

b) To observe whether patients with the same stage of the disease (i.e. early infectious syphilis) have impaired delayed hypersensitivity reactions and whether delayed hypersensitivity (cellular immunity) could explain the clinical patterns met with in Uganda.

c) To find out where the disease is most prevalent in Kampala and why.
MATERIAL AND METHOD

(a) Epidemiologic and Clinical Characteristics:

All consecutive patients attending the VD clinic attached to Mulago Hospital, Kampala for 3½ months (1st June-Mid-Sept. 1970) and diagnosed as having syphilis either on dark-ground microscopy and/or serology were studied. The parameters of study included place of residence, age, sex, tribe, socio-economic status, serological response in relation to the length of illness (obtained from history) and clinical features.

The VD clinic is traditionally a clinic for males and sees about 1000 new cases of early syphilis in a year. These represent only about a fifth or a quarter of all the new cases of syphilis in Kampala, a city of about 332,000 people (Uganda Census 1969). A majority of them are males, but a few bona-fide female contacts are also seen. A clinic for females was started in November 1970 (after the study).
(b) **Delayed Hypersensitivity Response:**

Twenty five subjects including eleven with primary syphilis, seven with secondary syphilis and seven controls were tested for delayed hypersensitivity reactions. The controls were selected from subjects without syphilis or any other condition known to impair immune responses such as thymic hypoplasia, leprosy, lymphoreticular neoplasms, malnutrition, immuno-suppressants, steroids, sarcoid, etc. Four common allergens were employed namely, Candidan albicans extract 1:100 (supplied as dermatophytin O, Holister-Stier Laboratories, Spokane, Wash.); Mumps Antigens (Eli Lilly and company, Indianapolis, Indiana); Intermediate strength purified protein derivative of tuberculin (0.0002 mg PPD) (Parke-Davies & Co., Detroit, Mitch.) and Streptokinase (400 U/cc) and streptodornase viridase (100 U/cc) (Lederle Laboratories, Pearl River, New York.

The allergens were administered as 0.1 ml intradermal injections on the voler aspect of the left fore-arm (if right-handed) or right fore-arm (if left handed) before the patients received treatment. The test sites were then dermacated and the patient was advised not to rub or scratch. Forty five to fifty five hours later the tests were read
by two independent observers. To minimise errors, the test site was viewed against a magnifying glass and the margins of the induration were carefully determined. Measurements of the largest diameters were then taken in millimeters. Any induration larger than five millimeters was taken as positive.

RESULTS

Epidemiology and Clinical Characteristics

During the study period 4,513 patients attended the VD clinic. Of these, 3,195 patients had urethral discharge and 1,318 patients had genital sores (the ratio urethral discharge: Genital sores = 12:5). Their age distribution was as shown in Fig. IV.

Among the 1,318 patients with genital sores, 315 were diagnosed as having syphilis by darkfield microscopy and/or serology. Among the 315 syphilitics, 203 had primary syphilis and 112 had secondary syphilis. (The ratio of Primary syphilis;Secondary syphilis = 2:1).

Sex and Age

Table I shows the sex and the median ages of the patients with syphilis. It can be seen that most females reported during the secondary stage. 272 patients were males (median age 22.7 years) and 43 were females (median age 18.7 years). The ages ranged
**Fig. IV:** Age Distribution of the 4,513 patients. It can be seen that there is absolutely no difference between Gonorrhea and Syphilis in as far as age of affection is concerned.
TABLE I

SEX AND AGE (MEDIAN AGE IN YEARS) OF 315 PATIENTS WITH PRIMARY AND SECONDARY SYphilis

<table>
<thead>
<tr>
<th>STAGE OF DISEASE</th>
<th>MALE</th>
<th>FEMALE</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Syphilis</td>
<td>197</td>
<td>6</td>
<td>21.8</td>
<td>21.5</td>
</tr>
<tr>
<td>Secondary Syphilis</td>
<td>75</td>
<td>37</td>
<td>22.9</td>
<td>18.3</td>
</tr>
</tbody>
</table>
from 13 years to 46 years in females and from 14 years to 62 years in males. The majority of female patients were contacts of the male patients.

**Place of residence:**

The number of patients and their places of residence are summarised in Fig. V. From this map it can be seen that most patients came from:

(a) Areas within easy reach of Mulago Hospital (Area A)

(b) Areas with rapidly growing industries (Area C)

(c) and Areas harbouring night-clubs, bars and prostitutes (Areas A, B & F).

Several patients also came from the periurban stations along the main roads leading into and out of the city.
Fig. V. The shaded areas show the localities with the highest incidence of syphilis. They are also the areas with Night Clubs and nearest the hospital.
## TABLE II

**TRIBAL DISTRIBUTION OF THE PATIENTS**

<table>
<thead>
<tr>
<th>TRIBE</th>
<th>MALE</th>
<th></th>
<th>FEMALE</th>
<th></th>
<th>TOTAL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Ganda*</td>
<td>112</td>
<td>(41.2)</td>
<td>21</td>
<td>(48.8)</td>
<td>133</td>
<td>(42.2)</td>
</tr>
<tr>
<td>Kiga*</td>
<td>29</td>
<td>10.7</td>
<td>1</td>
<td>2.3</td>
<td>30</td>
<td>9.5</td>
</tr>
<tr>
<td>Toro*</td>
<td>21</td>
<td>7.8</td>
<td>3</td>
<td>7.0</td>
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<td>7.1</td>
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<tr>
<td>Ankole*</td>
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<td>3</td>
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<td>17</td>
<td>5.1</td>
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<tr>
<td>Nyaruanda*</td>
<td>12</td>
<td>4.4</td>
<td>1</td>
<td>2.3</td>
<td>13</td>
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</tr>
<tr>
<td>Soga*</td>
<td>10</td>
<td>3.7</td>
<td>2</td>
<td>4.7</td>
<td>12</td>
<td>3.8</td>
</tr>
<tr>
<td>Jaluo</td>
<td>11</td>
<td>4.0</td>
<td>1</td>
<td>2.3</td>
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<td>3.3</td>
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<td>2.9</td>
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<td>2.2</td>
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<td>2.3</td>
<td>5</td>
<td>1.5</td>
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<td>-</td>
<td>-</td>
<td>12</td>
<td>3.8</td>
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<tr>
<td>Other Non-Ugandans</td>
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<td>3.3</td>
<td>1</td>
<td>2.3</td>
<td>10</td>
<td>3.2</td>
</tr>
</tbody>
</table>

**TOTAL**  | 272  | 100 | 43  | 100 | 315  | 100

* Bantu
Tribal Distribution:

Table II shows the distribution of the patients according to their respective tribes. Those tribes with less than three patients were grouped under "miscellaneous". It is evident from the table that a large majority of patients (42.2%) were Baganda. When considered in terms of ethnic groups, most of the patients (77%) were Bantus.

Socio-Economic Status:

Only 54 patients (50 males and 4 females) were evaluated for this parameter. A more detailed study was being conducted by Dr. Msibambi. Of these 54 patients, all were unskilled and semiskilled labourers. Thirty one patients (57%) were unskilled labourers (porters, watchmen, shambaboy, waiters etc.); nine (16.7%) were semiskilled (artisans, policemen, clerks, etc.); five were self employed in business, three were school boys and girls; three were unemployed, and two were housewives.

Thus, almost all of the patients attending the VD clinic come from low-income group.

Serological Response:

Tables IIIa and IIIb summarise the serological tests of 187 patients (112 primary and 75 secondary). The titres for the Price Precipitation Reaction (PPR)
<table>
<thead>
<tr>
<th></th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
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<td>8</td>
<td>8</td>
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</table>

**Percentage of the Total**

**Number of Cases from onset of Symptoms**

**Table IIIa**

*Serological Response in Primary Syphilis*
and for the Reiter Protein Complement Fixation (RPCF) Tests are represented as mirror images of each other in ascending order.

In primary syphilis (Table IIIa) most of the patients reported within the first two weeks of onset of the chancre. 50.7% had a negative PPR test and 64.3% negative RPCF test.

In secondary syphilis (Table IIIb) most patients (64%) reported within the first two weeks of onset of symptoms; 91% of the male patients and all the female patients had primary chancres in addition to the secondary erruptions. About 90% had positive serology. Females tended to report a little later than males.

The 10 - 12% seronegative results in patients with secondary syphilis almost certainly arose as a result of laboratory error. However the possibility that these individuals were, by virtue of their own constitution, incapable of producing humoral antibodies must not be discounted. A variety of subjects are known to behave thus. Unfortunately these patients were lost for follow up and their serologies could not be repeated, nor could their immunological capabilities be evaluated further.
Presenting Clinical Features:

In primary syphilis all the patients attending the clinic had Huntington chancre around the genitalia. Exogenous chancre were never seen. The details of the chancre were as summarised in Table IVa. Of the 40 patients studied, the ulcers were either small and multiple or large, confluent and phagocytic. A majority of them were indurated and around the foreskin (Prepuce), the neck and the corona of glans penis. Some were very tiny, unindurated but full of treponemal pallidum. Some sores were painful presumably because of secondary infection but as pain is a subjective phenomenon, it was not considered an important feature for study.

The regional inguinal lymphnodes were invariably palpable, firm and not matted, and sometimes painful.
<table>
<thead>
<tr>
<th>Site on Penis</th>
<th>No</th>
<th>%</th>
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<tr>
<td>On shaft and root</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>On Fore-skin (prepuce)</td>
<td>19</td>
<td>47.5</td>
</tr>
<tr>
<td>On Neck, Frenulum and Corona</td>
<td>15</td>
<td>45</td>
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</table>

<table>
<thead>
<tr>
<th>Number</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Multiple sores</td>
<td>25</td>
<td>65</td>
</tr>
<tr>
<td>One sore</td>
<td>14</td>
<td>35</td>
</tr>
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<table>
<thead>
<tr>
<th>Size</th>
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</thead>
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<tr>
<td>Less than 3 cms in diameter</td>
<td>27</td>
<td>67.5</td>
</tr>
<tr>
<td>Three cms and over</td>
<td>13</td>
<td>32.5</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Induration</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal or none</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td>Marked</td>
<td>31</td>
<td>77.5</td>
</tr>
</tbody>
</table>

| Total Number Studies                             | 40  | 100% |
### TABLE IV b

**DETAILED DESCRIPTION OF SECONDARY SYPHILITIC LESIONS**

<table>
<thead>
<tr>
<th>LESIONS</th>
<th>MALES</th>
<th>FEMALES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genital sores plus inconspicuous skin rash</td>
<td>27(40.9%)</td>
<td>4(11.1%)</td>
</tr>
<tr>
<td>Genital sores and gross skin rash</td>
<td>13(19.7%)</td>
<td>8(22.2%)</td>
</tr>
<tr>
<td>Gross skin rash alone</td>
<td>6(9.1%)</td>
<td>-</td>
</tr>
<tr>
<td>Condylomata latum and genital sores</td>
<td>12(18.2%)</td>
<td>9(25%)</td>
</tr>
<tr>
<td>Condylomata without genital sore</td>
<td>5(7.6%)</td>
<td>5(13.9%)</td>
</tr>
<tr>
<td>Genital sores, Condylomata and rash</td>
<td>3(4.5%)</td>
<td>10(27.8%)</td>
</tr>
<tr>
<td><strong>TOTAL NUMBER STUDIED</strong></td>
<td>66(100%)</td>
<td>35(100%)</td>
</tr>
</tbody>
</table>
Note: Although these descriptions refer mainly to male patients the same clinical pattern was noted in the few females studied.

For secondary syphilis, the most prominent lesions are summarised in Table IVb. Primary lesions were present in almost every patient (91-100%). Condylomata lata were very common especially amongst the female patients and were commonest around the genitalia and axilla. Skin rashes were also very common and ranged from mild maculo-erythematous-papular rashes to gross papulo-pustular and ulcerative lesions. Anular lesions on the face were commonly seen. Lymphadenopathy, general aches especially in bones and toxaemia were also evident in some patients. While females presented mainly with condylomata lata males usually presented with skin rashes especially the inconspicuous type.

ILLUSTRATIVE CASES:

Two cases with very severe lesions are presented for illustration.

CASE I (Fig. VI: T.I. a 35 year old muganda male, resident in Kibuli locality since childhood presented at the skin clinic in August 1970 complaining of ulcerated wounds all over the body. These had started as small pastules and had rapidly increased in the preceding 2 - 3 weeks. He had had a genital sore --------------------------
Fig. VI: Shows extensive eruptions of Secondary Syphilis.
On the face.
Fig. VI: Shows extensive eruptions of Secondary Syphilis. On the back
two years previously but had never been sufficiently treated.

On physical examination he was a young, febrile and toxic looking male. He had large pox-like and confluent ulcerating lesions all over the body, especially in the face. These lesions were covered by yellow crusts. In addition he had maculo-papulo-pustular lesions; palpable lymphnodes in the neck, axilla, troclear and inguinal region, and a large spleen (4 cms below costal margin). Other systems were unremarkable.

Serology was strongly positive for syphilis (PPR 1:128 & RPRFT 1:64). Dark field microscopy was not done. He was treated with penicillin aluminium monostearate (PAK) 14.4 mega units and made a rapid and uneventful recovery.

Comment: This case mimicks many of the cases reported by early pioneers (Lambkin 1908 and Loewenthal 1939). It also mimicks the descriptions offered by Hackett (1946) on yaws. However, as this patient had never left Kampala where yaws is completely erradicated and since he had a definite history of exposure, it is unlikely that he was suffering from yaws.
CASE II:

P.M. a 20 year old Zanaki female (from Tanzania) resident at Mengo, presented at the V.D. clinic in July 1970 complaining of two weeks itchy skin rash, hoarse voice, and increased loss of hair. She was a second wife to a polygamous marriage and denied history of extra-marital sexual intercourse.

On examination she was a young adult African female, with a florid papulo-pustular rash that tended to coalesce and form ulcers. She also had a large right labial sore (4 cms diameter); condylomata lata round the vulva; ulceration of the larynx and buccal mucosa; generalised Lymphadenopathy and hair loss. Spleen was not palpable and systemic examination was unremarkable. She was febrile, toxic and foul smelling (like smegma).

Dark-field examination of materials from one of the pastules and from a genital lesion revealed a large number of Treponema pallida. The serology was also strongly positive for syphilis (PPR 1:128; PPCFT 1:64). The husband and the co-wife were also strongly positive serologically but none of them had active lesions. She was given PAM 14.4 mega units and made a rapid and uneventful recovery. The contacts were also fully treated.
Comment:

This lady illustrates several interesting features. Clinically the lesions were unlike those of classical syphilis in that they were itchy. In addition they were so gross that they could easily be mistaken for impetigo or yaws.

Socially she represents one of the key problems to the social venerology in Africa namely polygamous marriages. These marriages are often loose and, predispose to promiscuity. Bennett, F. J. 1964 reviewing the social determinations of Gonorrhoea in rural areas strongly emphasised the dangerous role of Polygamy in VD.

B: DELAYED HYPERSENSITIVITY RESPONSE

This study was conducted entirely on outpatients and as a result four patients were lost for follow-up. These included two controls and two patients with primary syphilis.

Of the 21 patients who came for follow up, all were significantly sensitive to at least one of the four common allergens. The details of these patients and the results of the skin tests are summarised in Table V. Every induration measuring five mm, and above was taken as positive.
<table>
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<th>Female/ND</th>
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<td>Herpes Zoster</td>
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<tr>
<td>Chancroid</td>
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<td>Genital Ulcer</td>
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SECTION IV

DISCUSSION

Epidemiology

The results herein obtained illustrate several interesting features of syphilis in Uganda. To start with, they show that most of the patients with syphilis in Kampala and Uganda at large, are young (median ages 23 years and 19 years for males and females respectively). Youth is usually very enquiring and easily tempting, especially with regard to sex, so that many of those who fall victim of venereal disease are young.

Other predisposing factors include liberal sexual practices, lack of stigma associated with venereal diseases and high alcohol consumption. In the Western World the rate of venereal disease is likewise highest amongst the young people, but unlike in Uganda the commonest social determinants include contraceptives and drug indulgence (King 1970), both of which are not yet a problem in Uganda.

Another factor worth of note is prostitution. In Uganda and in Kampala particularly there are innumerable numbers of prostitutes, many of whom are infected and rarely get treated. Accordingly a high number of the patients came from those sections of Kampala
such as Bwaise, Makerere-Kivulu, Mengo-Kisenyi, Katwe and Kiwuliriza where prostitution is rife (Fig. V). Bennett (1962) reviewing the social determinants of Venereal diseases in urban areas in East Africa also observed that a large number of prostitutes abound in Kampala and that a majority of them never get treated.

Up to November 1970, the VD clinic catered mainly for males and a few contacts. Accordingly, the number of females in this study was very small. However, this does not mean that females in Kampala do not suffer from syphilis. On the contrary, they do, but for anatomical reasons the early stages in most of them may not be noticed unless they are fulminant. Consequently, of those who reported for treatment a majority were suffering from secondary syphilis and had exuberant lesions. Those females who never develop severe lesions, presumably do not get treated. As a result the number of children with congenital syphilis in Kampala is frighteningly high. In a period of one year (1969) over 20 new cases of early congenital syphilis were treated in Mulago Hospital alone. (Masawe & Lomholt 1970). There must be many more who do not reach the hospital.
Notwithstanding that it is improper to assess the prevalence of a disease in a community directly from hospital data, for lack of more accurate statistics, one can approximately deduce the incidence of early syphilis in Kampala from the attendance figures at the VD clinic. Taking into account that about 1000 - 1200 patients with early syphilis attend the VD clinic yearly and that such patients represent only about a quarter to a fifth of all the cases in Kampala, a city of about 332,000 people, the incidence must be of the order of about 1,300 - 2,000 cases/100,000 population. This compares very well with the figure 1-3% obtained from serological analysis (Masawe & Lomholt 1970).

These cases are distributed all over the city including the surrounding trading centres. However there are certain foci which have very high incidence. These include, as mentioned above, sections where prostitution is rife. They also include those areas where factories are rapidly growing and where Night clubs are situated. Employment facilities in the factories attract labour from rural areas and when those concerned arrive, they leave their families behind. Sooner or later they become frustrated and fall victims of promiscuous life
and venereal diseases.

Looking at the results one might conclude that the Baganda have a higher incidence of syphilis than other tribes in Uganda. However, Kampala is within Buganda, and as such most of the patients attending the VD clinic are likely to be Baganda. If the results are examined from the point of view of ethnic groups, one is immediately struck by the preponderance of syphilis among the Bantus. Bantus in Uganda have more or less similar cultural and social characteristics; their attitudes towards sex are least refraining and many of them are resident in Kampala.

As usual most of the patients attending the VD clinic belong to the low-income group. Of the few patients reviewed, none had a better position than that of artisans, but this does not mean that people of higher income do not contract syphilis. On the contrary they do but instead of attending the clinic for treatment they go to private practitioners in town. On one hand they are able to pay for the treatment and on the other they are ashamed of being treated in public clinics. Almost every private practitioner in town, admits to treating a case or so of early syphilis every day. Syphilis is also common
amongst University students (Arya & Bennett 1967) who, without doubt, represent the upper social class of the population.

**Serology**

Regarding the serological conversions, 60–64% of patients with primary syphilis were seronegative. When correlated with length of illness, a majority of the patients reported in less than 2 weeks from the time of onset of the primary chancre. In syphilis, the standard serological tests become reactive in about one to four weeks after the appearance of the primary chancre or four to eight weeks after the infection (Lassus et al 1967). By analogy most of our patients seek medical help early. What prompts them to seek medical aid early is unknown. However, almost certainly the lesions of syphilis amongst our people become extensive quickly and as such the patients are compelled to seek help. That this is so, is substantiated by the high percentage of seronegative patients in the primary stage.

**Clinical Features**

In connection with the clinical features, the majority of primary chancre in the patients studied were multiple and confluent or single but
extensive and phagaedenic. This same picture was reported by other investigators in the past. Loewenthal (1939) thought that the exuberance of the lesions was due to lack of circumcision. However, even among the circumcised individuals, the same picture obtains.

The secondary lesions were likewise exuberant amongst the patients studied, and of the same characteristics as those reported by workers early in the century. Condylomata lata were particularly common among the female patients.

Classically, syphilis manifests itself in four sequential clinical stages namely, the primary, the secondary, the latent and the tertiary stages. The primary stage is characterised by a painless primary chancre and palpable regional lymphnodes. The chancre arises at the site of contact (usually the genitalia), is small, often single and indurated. The lymphnodes are enlarged, firm, shotty, painless and non-suppurative.

The Secondary stage appears four weeks to six months after the primary chancre and is characterised by conspicuous or inconspicuous skin rash, generalised adenitis, mucous patches and condylomata. Morphologically the rash is either macular, papular, papulosquamous pustular, follicular, ulcerative or a mixture of two or
more of these morphological characteristics. The rash almost never itches or vesiculate. The oral lesions are usually eroding and the lesions around the genitalia or other moist rubbing surfaces are condylomatous. Systemic manifestations such as toxaemia, arthralgia, myalgia occur but not commonly.

Histopathologically the cardinal features of primary and secondary syphilis include endo-vasculitis of small vessels around the chancre or dermal syphilide; dense mononuclear infiltration and local tissue damage with fibroblastic reaction (Lever 1967).

Latent syphilis is always subclinical and symptomless and is detectable only by appropriate serological tests (Treponemal antigen tests). These tests include the Reiter Protein Complement Fixation Test (RPCFT), the Treponemal Pallidum Immobilization test (TPI) and the Fluorescent Treponemal Antibody-Absorption (FTA-Abs) Test. Very little is known about what goes on between the host and the parasite during this stage.

The tertiary stage appears 10-20 years after spirochaetaemia as gummata, cardiovascular syphilis or neurosyphilis. The gummata involve any part of the
body and are usually benign. Cardiovascular syphilis on the other hand localises in large blood vessels and is "malignant". Clinically, the features are either those of aortic insufficiency, aortic aneurysm or coronary ostia stenosis. Neurosyphilis likewise involves mainly the central structures and the paramount clinical characteristics are either those of meningo-vascular involvement, general paresis (GPI) and/or Tabes dorsalis.

Histopathologically, the cardinal features of late syphilis include:

(a) **Cardiovascular Syphilis**— Adventitial arteritis with dense perivascular mono-nuclear cell infiltrates; medial necrosis with degeneration of elastic tissue secondary to endarteritis of the vasa vasorum, and intimal thickening, fibrosis and scarring.

(b) **Neuro-syphilis**

Pan-arteritis of small meningeal vessels with dense mono-nuclear infiltration, intimal proliferation and thrombosis, meningeal thickening, and atrophy of cortical or posterior spinal cells.
Why syphilis in Uganda should diverge so much from the classical picture (assuming that what is reported from the West is classical) remains a mystery. Lambkin (1908) thought the disease was atypical because it had been implanted on a virgin land; Loewenthal (1939) attributed the severity of primary chancre to lack of circumcision and Hudson (1958) postulated that lesions in the tropics and subtropics were severe because the indigenous population walked naked in hot and extremely humid environment, but none of these explanations is very convincing. Seventy years after Lambkin, the lesions are still severe and atypical. In addition, both the circumcised and the uncircumcised subjects manifest the same multiple lesions. Levaditi (1906) postulated that the strains of spirochaetae responsible for syphilis in the tropics were probably different, but Frazier and Hu (1948) studying the racial differences in syphilis could detect virtually no difference between strains of T. pallidum recovered from oriental chinese and those isolated from occidental Americans when these strains were injected into rabbits and incubation periods determined.
Some investigators have postulated that hormonal and metabolic constitutions of people in different parts of the world are probably different and responsible for the differing clinical spectra. Chesney (1923) and Magnuson et al (1951) found that in experimental syphilis the signs were worse in male rabbits than in females. Kemp and Show (1938), Kemp, et al (1939) and Frazier et al (1935) in other experimental models further showed that when oestrogens were injected into male rabbits the severity of lesions were lessened. Whether levels of androgens are higher amongst our people is difficult to say. The author is not aware of any study to this effect.

MacArthur (1923) hypothesised that syphilis was atypical amongst the South African Bantus because the high antibody levels elaborated in these people after repeated infections, modified the disease. As regards the antibody levels, McArthur was perfectly correct. It has been demonstrated that immunoglobulin levels are higher among inhabitants in the Tropics than amongst those outside the Tropics (Turner & Voller 1966, Rowe et al 1968). However,
as regards syphilis and antibody levels no correlation between humoral antibodies and clinical lesions has hitherto been demonstrated. In latent syphilis, high titres of antibodies are demonstrable while clinical lesions are lacking, and in primary syphilis gross lesions become apparent long before humoral antibodies appear. It is unlikely therefore that humoral antibodies have any major role to play in the observed differences.

**Cellular Immunity**

That appears more likely, is the possibility that cellular immunity among the indigenous people and those in the Tropics as a whole is over-active and correspondingly heighten the lesions. In other words the lesions could be regarded as accentuated delayed hypersensitivity reactions.

Cellular immunity in syphilis is little studied but from the existing knowledge it is highly probable that several syphilitic reactions are essentially delayed hypersensitivities. The histopathologic features of syphilis (Lomholt 1967, Lever 1967) consisting of mono-nuclear cell infiltrate peri- and vascular cuffing/endarteritis simulate those of delayed hypersensitivity reactions (Benacerraf & Green 1959), Spector (1967); the mean incubation period
for syphilis of 14-28 days (Wilcox 1964) closely overlaps that for delayed hypersensitivity reactions of 14-21 days (Zweiman 1967); several clinical states (e.g., malnutrition) which impair cellular immunity (Watts E. 1969, Lloyd 1968) also lessen the severity of syphilitic lesions (Turner & Hollander 1957); and finally lesions of secondary syphilis closely parallel those of pox, vaccinia and other exanthomatous viruses which by analogy (Allison 1967, Mackaness 1967, Horsfall and Tann 1955, Gell & Benacerraff 1961, Kemp 1960 and Fenner 1948) manifest delayed hypersensitivity reactions.

Of further interest syphilis manifests several features of autoimmunity. For example, autoantibodies, soluble antigen-antibody complexes and cryoglobulins are demonstrable in a significantly large proportion of patients with syphilis (Fufferelli et al 1968, Mustakallio et al 1967, Barnet et al 1970). Consequently, since cell-mediated immune response have been considered responsible for the production of tissue lesions in experimentally produced autoimmune disease (Asherson G.I. 1968, WHO Tech. Rep. 423, (1969) it is probably correct that the reactions in syphilis
are due to cellular immune responses.

In keeping with the above views, all the patients tested were reactive to at least one or more of the common antigens.

Of course it has been argued (WHO Tech. Rep. 1969) that skin hypersensitivity tests do not strictly assess the degree of cellular immunity, but when the reactions are accelerated (that is they appear very early and vigorously) one can safely say that cellular immunity in that particular individual is overactive. Alternatively, where the tests become reactive in the presence of a factor known to suppress such immunity, one can logically say that the immune system in that particular individual is difficult to suppress and hence hyperactive.

Levine and collaborators (1969) studied by in vitro lymphocyte transformation, cellular immunity in 7 patients with primary syphilis, 12 with secondary, three with latent, one with gumma and 12 healthy controls and showed that patients with secondary syphilis had impaired immunity. None of our patients showed this phenomenon. However the techniques employed in these two studies differ,
but it is known that the two techniques test the same thing and give very comparable results (WHO Tech. Rep. 1969).

That cellular immunity amongst our indigenous patients is probably overactive, is further supported by the studies of Ziegler et al 1969 & Master et al 1970 which showed that all the normal subjects as well as several patients with melanoma or Kaposi's sarcoma tested had easily demonstrable cellular immunity.

Several factors are known to alter cellular immune reactions and hence delayed hypersensitivity. These include: age (maximum around 20 years), good diet, some genetic constitutions, intercurrent infections (Tuberculosis, Brucellocis, Malaria, and Vaccinia) and increased dose of antigens - all of which heighten the response. Others like Leprosy, Measles, Rubella, Debilitating clinical states, thymic aplasia, sarcoidosis, immunosuppressive drugs and malnutrition depress cellular immunity (Lloyd 1968, Benacerraf 1969, WHO Tech. Rep. 1969). The story of Malaria is interesting. The geographical mapping of Malaria and that of endemic treponenatosis (Fig. VIIa & VIIIb) very closely overlap suggesting that both conditions have subtle relationship. This relationship is probably immunologically mediated.
FIG VII a

Malaria Endemic Areas
Figs. VIIa and VIIb present the World-wide Mapping of Malaria and Endemic Treponematoses respectively. There is a definite and a very close overlap.
A considerable body of experimental evidence both in vivo and in vitro suggests that cellular immunity is responsible for cytolysis, certain inflammatory reactions and tissue rejections often encountered in clinical and experimental medicine. In vivo, Gell & Benacerraf (1961) noticed in the course of desensitization of guinea pigs in which a high degree of delayed sensitivity to picryl-guinea-pig-albumin had been established that about 50% of the sensitive animals developed a maculo-papular rash five to six hours after they had received a large dose of intravenous antigen. Allison (1967) also found while investigating the relationship between delayed hypersensitivity and skin rashes in guinea pigs infected with rabbit-pox viruses that as he sequentially skin tested them with attenuated viruses the skin rash and typical delayed hypersensitivity reactions developed simultaneously 4-6 days after the primary infection. He also noticed that when the experiments were repeated with cortisone treated animals, none of them developed either typical hypersensitivity reaction or typical rashes. From many other in vivo studies it has been established that delayed hypersensitivity reactions are responsible for allograft tissue.
rejection which as a matter of fact mimic the reactions in the primary chancre very closely.

In vitro, several studies have similarly demonstrated that lymphocytes (Covaerts 1960, Resenau & Moon 1961, Brunner et al 1958) and Macrophages (Bennett & Bloom 1968) are lytic to target cells. When sensitised lymphocytes come into contact with the target cells bearing sensitizing antigens, they become cytotoxic and liberate, among several chemicals, a macrophage inhibitory factor. The inhibitory factor then arrests macrophages which participate in the lysis of the target cells. The cytotoxicity is exponential and directly proportional to the ratio of immune cells: target cells, and to the degree of immunity in the host (Wilson 1965, Jameison & Wallace 1970). Up to 90% of the target cells could be destroyed in 6–9 hours when the ration of lymphoid cells: Target cells was 100:1 (Brunner et al 1968).

In syphilis it has been observed for years that certain infective agents such as vaccinia (which accentuate cellular immunity) exacerbate the manifestations of early syphilis and minimise those of late stages. During the 1918–1919 influenza epidemic, it was noticed
that some patients with mild syphilis had their lesions abruptly worsened (Pearce 1928). Similarly the same investigator showed that when rabbits were concomitantly infected with Treponema pallidum and vaccinia virus, their syphilitic reactions were profoundly intensified. The lesions were significantly more severe in the test animals than in the unvaccinated controls.

In Uganda and Tropical World at large, many of these infectious agents are ubiquitous. When their effect is combined with the genetic factor, namely Negroes have more active immunological systems than caucasians (Rowe et al 1968) and age factor which presupposes that the immune systems are most active at around 20 years - (the right age for most of our patients) then the reason for the exuberant lesions amongst our patients becomes obvious.

How the aforementioned infective agents heighten the hypersensitivity reactions of syphilis is not at all understood. However it can be suggested that the agents share antigen(s) with the treponemes and probably the host cells so that when
one contracts both of them at the same time or following another, the dose of antigen is duplicated and the body responds more vigorously. Treponemes share cardiolipin and other antigens with the hosts tissue and other micro-organisms (Cannefax 1967).

Alternatively, the clinical manifestations and cellular damage in syphilis might only be a non-specific by-product of any immunological reaction so that the more immune the animal or individual is, the severer the reactions. Non-specificity is a well known feature of delayed hypersensitivity especially in infectious conditions (Howard 1961, Blanden et al 1966, Mackaness 1967).

Concerning late syphilis the features commonly encountered in Uganda at the moment are difficult to explain. The lack of dense cellular infiltrate especially is a cause for concern.

Some investigators have postulated that probably these features represent a burnt out process either as a result of previous attacks of yaws or as a result of wide and indiscriminate use of antibiotics for non-treponemal conditions (Steiner 1969). However, these hypotheses are difficult to
substantiate. If antibiotics were so significant one would expect this feature to be universally manifest both in syphilis as well as in other chronic conditions and both in the tropics as well as outside the tropics. Admittedly cases of a similar histology have been reported from various parts of the world under various names (Rostrepo et al. 1969, Abrahams & Cockshott 1962), but a majority of them come from the tropics.

My thoughts are entirely different. Either our patients have a deficient cellular immune system and are unable to respond to the Treponemes and their antigens, or they elaborate a factor which depletes their bodies of immunocytes and other mono-nuclear cells. Which is which is difficult to tell. However, the former (deficiency in cellular immunity) is rather unlikely in view of what has already been cited.

For survival every physiological activity in the body is very carefully regulated especially if its effects are injurious in the long run. The activities of the cellular immune system are not without ill-effects. Accordingly the body is is probably equipped with a control system which moderates the cellular immune responses, counteracts its ill effects and operates at par with
it. Such a system has herein been named "Factor-M-
(Moderator) System" and its mode of activity is illustrated
in Fig. VII.

An imbalance between these two systems with
the Factor M System overriding is probably responsible
for the poor cellular infiltrate already cited.
Fig. VIII: Shows a "Hypothetical" Mechanism by which Cellular immune system of an organism is controlled (Factor "M" Defence System)
SECTION V

CONCLUSION

In concluding this work, a few points must be emphasised namely:

(a) that syphilis was unknown in this country until it was initially introduced by the Arabs;

(b) that the disease poses tremendous clinical and epidemiological problems that require more scrupulous attention;

(c) that the unusual picture is due to hyperactive cellular immune system which the indigenous population is endowed with, and

(e) that the hyperactivity of the immune system is partly due to genetic factors and partly due to frequent and perpetual infections and

(f) finally that the activities of cellular immune system are probably controlled by another defence system.
SECTION V

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