TREPONEMATOSIS AND AFRICAN SLAVERY*

BY

E. H. HUDSON

Cedar Grove, Wis., U.S.A.

The so-called unitarian (or unicist) concept of treponematoses emphasizes the evolutionary relationship of yaws, pinta, endemic syphilis, and sporadic syphilis, regarding them all as varieties or syndromes of one disease caused by one parasite, *Treponema pallidum* (Hudson, 1946).

The unitarian view accepts the fact that there is no known test by which the parasites of these treponemal infections can be qualitatively differentiated, and concludes that the four clinical syndromes represent a classification based on epidemiology and geography, and not on aetiology. This concept also includes the belief that endemic non-venereal forms of treponematoses were widespread in the past, and that it was improvement in personal and community hygiene, rather than some change in the parasite, which converted non-venereal (endemic) syphilis into venereal (sporadic) syphilis *pari passu* with the evolution of urban civilization (Hudson, 1958a).

The implications of the unitarian view have recently been elaborated in two papers correlating treponematoses in the one case with anthropology (Hudson, 1963a) and in the other with religious pilgrimage including the Crusades (Hudson, 1963b). In relation to anthropology the following ideas are developed:

- (a) treponematoses in the form of yaws originated—as did man—in sub-Saharan Africa at some distant point in Paleolithic time;
- (b) it then spread with human migration to the temperate zones of the world where, in a different set of epidemiological conditions, it became endemic syphilis, flourishing especially in the villages which first appeared in the early Neolithic period;
- (c) a gradual transition then ensued from non-venereal to venereal syphilis when towns and cities came into being in the later Neolithic

period. The superior hygiene of the city gradually eliminated opportunities for the transmission of the childhood infection, and the increasing sophistication of the adult population provided the epidemiological basis for the spread of venereal infection.

Thus the evolutionary history of treponematoses has probably run a parallel course with the evolutionary history of man and human society.

If it is accepted that with changes in environment yaws is converted into endemic syphilis, and endemic in turn into sporadic syphilis, it must be assumed that these phenomena of change cannot be limited to any particular place or time, but must take place anywhere in the world that the appropriate changes in human life and environment occur.

Starting with this premise, the present paper marshals the salient historical and geographical facts about the institution of Negro slavery, as it has been carried on for the past 2 or 3 thousand years. The reasoning is that, if treponematoses was as widespread as seems to have been the case in the regions of Africa south of the Sahara, then it must have accompanied millions of the Negroes who, in the course of history, were shipped over oceans and driven across deserts to serve and to mix their genes with the peoples of the cooler climates of the world.

These black men, women, and children were captured in that very area on both sides of the Equator in which yaws and endemic syphilis are admitted to be most closely related to antiquity and most prevalent in both historical and modern times. Furthermore, Negroes were dispersed from there in such numbers by the slave trade as to make the Negro race second only to the Europeans in their diffusion over the earth's surface, one of the most remarkable forced migrations in history (Crowder, 1962).

Their treponematoses was in the form of yaws and endemic syphilis, and it retained this character when the slaves' new homes were comparable in climate and hygiene to the African habitats from which they

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had been torn. On the other hand, these non-venereal forms of treponematoses could quickly initiate venereal infections among the adult Negroes under the influence of a more temperate climate, the wearing of clothing, and the improved hygiene of a more civilized environment. In such a case, many groups of imported Negroes must have constituted foci for the local propagation of venereal syphilis soon after their arrival, through sexual contacts with the local inhabitants.

Slaves in the Iberian Peninsula and the Caribbean

The first treponematoses to be introduced to the Caribbean from Africa came in 1502 with the first Negro slaves. Its incidence increased after 1512 with the spread of slaveholding associated with the commencement of sugar cane culture (Weatherford, 1924). Contemporary writers of the 16th, 17th, and 18th centuries testified that every slave ship from West, Central, and South-east Africa was normally expected to have its quota of infected slaves when it arrived in South, Central, and North America. Many were from the savanna south of the Sahara, a region characterized by endemic syphilis; others were Negroes from the adjacent region in West and Central Africa (Weatherford, 1924) characterized by yaws.

Under the crowded conditions of the slave ships and the humid heat of the West Indies, any distinction between yaws and endemic syphilis probably would be lost. Before they were offered in the Caribbean slave markets they were "made up"—their skins rubbed with oil and their sores made less conspicuous with "mercurial ointments and repellent drugs" (Mathieson, 1926). Some of those thought to have yaws were palmed off in this way; the others were isolated in yaws stockades. Every plantation had its "yaws house" for those who subsequently developed lesions. The means used to treat yaws patients often proved fatal. The slave trade was a speculative business, for the importer lost one in six of his stock before sale, and the planter one in three in the process of "seasoning" (Mathieson, 1926).

Events of the 16th century were not the beginning of the West African slave trade; they are introduced here because they give the clearest picture of the Negro slaves and their burden of treponematoses. Actually, the capture of slaves on the coast of West Africa was begun by Portuguese ships in 1442, 50 years before Columbus' first voyage, and this event followed a history of many centuries of overland slave traffic by Spain and Portugal (Helps, 1900; Bradford, 1960; Debenham, 1960). Both these

countries, through long contacts with Africa, had been accustomed to dark-skinned people; they both still show strong traces of African blood and culture (Bontemps, 1948).

The Saracenic domination of the Iberian Peninsula had meant the maintenance of a slave culture that for more than a thousand years was continually fed by fresh importations of brown and black men brought north across the desert from the savannas and rain-forests of sub-Saharan Africa (Helps, 1900; Farwell, 1957). For example, when Alfonso VI of León and Castile captured Toledo in 1085, the Moslems, fearful of defeat, called for help from the Almoravides (*El Morabiteen*, those bound together) across the Strait. This fanatical sect had not only converted the tribes of the western Sahara, but had overthrown Ghana (no relation to the modern state), penetrated into Nigeria, and mobilized the Negro people. They had then turned northwards and founded their capital at Marrakesh. Their leader, who wore a veil and lived on barley bread and camel meat, abolished unlawful taxation, wine-drinking, and musical instruments. This was the force that in 1086 arrived by invitation in Spain, bringing along their immense trains of baggage camels, their drums, and their black troops. Their supremacy was short-lived, but they were succeeded by another wave out of Africa, the Almohads (*El Mowahideen*, the unitarians), who were defeated by the Spanish Christian forces only in 1212 (Livermore, 1958).

The Portuguese activity that began on the West Coast in the mid-15th century, therefore, merely moved the slaving enterprise from land to sea and made the operation easier. In fact, the ease with which the first lots were captured encouraged more and bigger forays farther south. Within 4 years forty ships had brought back 927 captives (Beazley, 1914), and soon the annual importation exceeded a thousand (Bandinal, 1842; Helps, 1900). A guild of slave traders was formed in Lagos in 1444 (Weatherford, 1924). So many Negroes were brought to Portugal in the second half of the 15th century, that the malaria they brought with them depopulated portions of the Tagus valley (Linton, 1955). There were so many imported slaves in Seville that Ferdinand and Isabella appointed a celebrated Negro as a sort of mayor of the black community (Helps, 1900). Berber slaves from North Africa were almost white, and slaves from sub-Saharan Africa were usually brown; but as expeditions reached the bulge of Africa the human booty was more commonly jet black and thick-lipped, and more prized on that account. By the early 16th century the number of Negroes in some parts of Portugal outnumbered the local native Portuguese (Davidson, 1959).

The manpower problem in Portugal at that time was acute. Wars with Castile and the Moors, colonization of the Azores and Madeiras, and recurrent plague in Porto and Lisbon had reduced the male population. In contrast to the slaves that were shipped later to the New World plantations, all slaves in Portugal at this time were treated with kindness, taught trades, and allowed to marry. Within a generation they had the status of other labourers and peasants (Bradford, 1960). When Columbus on

his third voyage paused at the Cape Verde Islands he was told that the slave trade was going strong, with much demand from Castile, Aragon, Portugal, Italy, and Sicily (Madariaga, 1940).

By 1518, Portugal alone was carrying 4,000 Negroes annually westward across the Atlantic (Weatherford, 1924); by 1539, 12,000 were sold annually in Portuguese markets (Bandinal, 1842). This country had the monopoly at first, but Spanish ships began to encroach on this lucrative trade

(Livermore, 1958). Most slaves were first brought from Africa to Lagos in Portugal, Seville in Spain, or some other Iberian port for indoctrination and baptism in the true faith before being forwarded to the overseas plantations.

There is abundant testimony that these ocean-borne slaves were infected with yaws. Is it rational to assert that the slaves that had been imported overland from the same African sources in the preceding millenium were not similarly infected? Comparing the half-century 1450–1500 with the half-century 1500–50, would it be rational to suppose that the Negroes that remained in Iberia *before* 1500 were free of treponematosi, whereas those who went on to the New World *after* 1500 were infected? Would anyone suggest that the slave ships after 1500, returning from Africa with their cargoes containing infected slaves, did not introduce any treponematosi at their home ports in Spain and Portugal while they lay over there between voyages, or waited for the trans-shipment and doctrinal preparation of their human freight destined for America?

Treponematosi in Europe

Ever since the time of Sydenham (1624–89) it has been suggested that the importation of these many thousands of infected Negroes into Spain and Portugal must have had some bearing on the incidence of treponematosi in Europe in the first half of the 16th century. The Spanish called it *bubas* (pustules) and the Portuguese *boubas*. These names went with the slaves' disease to the New World and there became synonyms of yaws, itself a native word for the infection that English traders had heard in Africa. Bubas was an old word in Spain, related to a Latin word of Pliny's time, associated by him with a contagious disease that came from the eastern Mediterranean, conveyable by kissing and characterized by lesions around the genitalia (Hudson, 1961). An alternative name in Spain in the 15th and 16th centuries was *empeines*, which also turns up in the New World designating a skin lesion of pinta.

It is significant that Villalobos, the Spaniard of Salamanca, who was one of the first to write about bubas and the very first on Spanish soil to do so (publication date, 1498), described it as a pustular disease of the skin. Though he recognized a penile sore, he did not realize its venereal significance; he regarded bubas as a contagious exanthem rather than a primary disease of the genitalia (Hudson, 1962).

The description of syphilis in Europe in the early years of the 16th century, and the appearance and distribution of the "pustules" in the illustrations of that time are remarkably like treponematosi of the

yaws type. When such infections came with the slaves they would be transmitted non-venereally to the indigenous population in places where the level of personal hygiene was low; but in a clothed society in a temperate climate the pustules on the body would give way to oral mucous patches and genital condylomata, whence a venereal epidemiology would soon arise. This succession of events was probably going on all over Europe during the Middle Ages, but it seems to have been particularly true in the Iberian Peninsula around 1500. It is hard to escape the conclusion that the slave trade of the second half of the 15th century brought a large quantity of treponematosi to this region. Villalobos related the infection neither to France nor to the New World. His testimony supports the assumption that it was generally regarded as indigenous.

All this, however, is starting the story of African slavery near its end. In order to get it in proper perspective this narrative now needs to go back to the history, in turn, of West and Central Africa, Egypt, Ethiopia, Arabia, the East Coast of Africa, and the Far East. Then, returning *via* Madagascar, the story ends with the Mediterranean. It will become obvious that almost all of the Old (pre-Columbian) World had been exposed to treponemal infection by the institution of Negro slavery.

Early Slavery in Africa

The Negroes were undisturbed in Africa until about 20,000 years ago. Living in a climate unattractive to other races, they suffered little by displacements (Taylor, 1927); but later, along their northern borders, their territory was penetrated for thousands of years by Mediterranean, Hamitic, and Semitic peoples. Slavery among the Negroes themselves began in prehistory; not only tribes but even villages attacked and enslaved their neighbours. Mungo Park (1771–1806) estimated that in his time there were three slaves for every free man in Senegambian and Nigerian Africa, where he was travelling when he died (Weatherford, 1924). Thus, when Egyptians, Romans, Arabs, and Portuguese in turn revealed a desire for slaves, they were only adding a commercial stimulus to an established social phenomenon. The first raiders went up the Nile, or across the Sahara, or down the east or west coasts, surprised and burned a village or two, shackled the young and vigorous who could stand the journey, and marched or shipped them back to the home markets. After a time, the slaver simply announced himself to a petty chief and became the buyer on the spot as in a cattle market (Debenham, 1960). The Portuguese arranged with Arab dealers to take care

of matters in the interior and bring in by trickery and force a continual flow of slaves to fill the "factories" on the coast (Bandinal, 1842; Bontemps, 1948).

Climatic Zones of Africa

The part of Africa particularly associated with slavery lies south of the Sahara. Here is a large area, straddling the Equator and comprising more than a million square miles of forest land with a mean annual rainfall of 60 inches or more (Kimble, 1960); generally speaking, this area extends from Gambia south to Angola, and across the continent to the Great Lakes. Much of this region is rain-forest where heat, humidity, and rainfall persist throughout the whole year. This is the homeland of yaws (Hackett, 1957).

To the north, east, and south of this equatorial region lies the savanna, an enormous area where the year is divided into wet and dry seasons, and where precipitation gradually diminishes to 30 inches or less (Kimble, 1960). As the rainfall decreases the forested country gives way to savanna country, an open landscape characterized by low vegetation, thorn bushes, and scrub trees. North of the Equator the savanna runs from Niger to Nile, virtually spanning the 3,000 miles between the Atlantic and Indian Oceans; at some points its north-south width reaches 500 miles (Davidson, 1959). Only the grass-covered steppe separates the savanna from the Sahara.

The Sudan, comprising both savanna and steppe, has always been the vestibule to the heart of Africa, a fertile region traditionally occupied by a cattle-keeping pastoral aristocracy dominating an agricultural peasantry (Kimble, 1960). The line between grazing and tillage has been closely related to rainfall, which gradually increases southward from the desert and steppe through the savanna to the rain-forest (Linton, 1955). The climate of the Sudan is therefore transitional between extremes of drought and humidity.

This region is to-day the seat of an indigenous endemic syphilis (Mathurin, 1953; Baylet, 1954; Davies, 1956) which—there is every reason to believe—has been present since prehistoric times. The transitional nature of the climate is reflected in the clinical characteristics of this form of treponematosi. Those victims of the disease who inhabit the desert and steppe have lesions in the mouth and grouped around the orifices and folds of the body, as in the endemic syphilis of other hot, dry regions. Towards the south near the rain-forest the lesions commonly resemble those of yaws. In the intermediate zone the treponemal infection shares the characteristics of both syndromes, depending on the

local elevation and the changes of wet and dry seasons (Grin, 1961). As to those regions of rain-forest, savanna, and steppe that extend *south* of the Equator, events exactly parallel to the above take place in the symptomatology of treponematosi.

The energetic savanna people of the Sudan developed a remarkable economy starting from the pastoral-agricultural base and evolving into four or more powerful kingdoms in the earlier centuries of our era. These city-states (Ghana, Melle, Kanem-Bornu, Songhay) at the height of their power controlled more than half a million square miles of high and often well-watered grasslands (Davidson, 1959). The Empire of Kanem-Bornu, for example, began in the 8th century A.D. and lasted for a thousand years, an impressive political entity extending north to Fezzan and south into the untapped lands of the Negroes, and controlling for centuries the Sahara routes to the Mediterranean seaboard (Crowder, 1962).

Caravan Routes

These trade routes not only posed the obvious risks of thirst and loss of direction, but in addition the hazards of pillage by the raiding Tuaregs unless prior tribute had been paid. These veiled nomads, operating on the fringe between desert and savanna, between white and black men, kept the Caucasoid blood of their nobles "pure" while mingling their servile class indiscriminately with Negro slaves (Coon, 1954).

The merchants of Timbuctu and Gao on the Niger, of Kano and Katsina in the plain, and of Bornu-Kanem around Lake Chad grew rich as they launched caravans and coffles eastward through the savanna corridor to Darfur, Egypt, Ethiopia, and Arabia; or northward to Morocco, Algeria, and Tunis. They monopolized trade in the leather and fabrics of local manufacture, bought and sold gold from the headwaters of the Senegal, Niger, and Volta rivers, pepper from Equatorial Africa, and salt collected from ancient lake beds in the desert (Kimble, 1960). Most importantly, they dealt in slaves from the black country to the south, captured in their raiding parties which sometimes even included cavalry.

Continuous wars between these savanna kingdoms signify their bitter contention for the right to be the southern terminus for the lucrative trans-Saharan caravan and slave trails. These routes were three in number (Davidson, 1959). Farthest west, one led from the Niger in the vicinity of Timbuctu toward the Atlas Mountains and present-day Morocco. Farthest to the east and most commonly used, was the one that led north from Lake Chad *via* the Hoggar Mountains and the oases of the Fezzan to Tunis,

Tripoli, and Libya (Herrmann, 1954). Between these two was the third and most hazardous trail, from the Niger bend to Algeria.

In Arab times (*i.e.* after *c.* A.D. 700) hundreds of thousands of Negroes were exported annually across the desert to Mediterranean countries (Weatherford, 1924); large numbers perished on the way. Timbuctu in the 14th and 15th centuries carried on a brisk slave trade with Egypt and Asia Minor (Herrmann, 1954). As late as the early 19th century, the Arab merchants of Tripoli and Morocco, interested in preserving their profitable Saharan trade, put pressure on the Fulani Sultan of Northern Nigeria to make him discourage penetration from the southern coast by British explorers and traders (Crowder, 1962).

African Slaves in Dynastic Egypt

Slavery appears early in Egyptian history. Neolithic culture in the Egyptian Sudan was Negroid, and the Nubians inhabited the upper reaches of the Nile (*nub* was the word for gold) (Davidson, 1959). Here, earlier than 5000 B.C. was a Negroid empire that later split into Egypt and Ethiopia (Bontemps, 1948). The last two dynasties of the Old Kingdom in Egypt (which ended in 2300 B.C.) became obsessed with the desire to conquer Nubia and waged constant war with the Negroes there. Slave raids for the purpose of getting fighting men were routine, for Nubian mercenaries made better soldiers than native Egyptians who were disinclined to fight (Linton, 1955). When Nubia was finally conquered during the 18th Dynasty (1580–1320 B.C.), Egyptians penetrated as far as Lake Chad, Uganda, and the Congo (Davidson, 1959).

Although it may be difficult to find exact parallels between Egyptian civilization and that of Central and West Africa, there is a basic similarity. The Egyptian priests, like the African, used masks in their rituals, and the earliest Egyptian pattern of social organization included localized, enduring kin groups like those that are still common in Negro agricultural Africa. The sacred king and the queen-sister are shared by Egyptian and Negro traditions; a spiritual "double", called Ka and Kra respectively, is common to the Egyptian and Ashanti religions (Linton, 1955). Analysis of 800 predynastic skulls (before 3000 B.C.) shows at least one-third to be Negro. Dynastic Egypt emerged from the womb of Africa (Davidson, 1959), and doubtless shared in Africa's treponematosis.

Punt was the name given by the Egyptians to a southern region, rich in desirable articles of commerce, that could be reached either by land or sea. In 3000 B.C. Sneferu brought 7,000 Negro slaves to

Egypt in sixty ships and the grave of an Egyptian sea captain who died in 2300 B.C. records that he made the round trip to Punt eleven times. In 1501 B.C. Queen Hatshepsut, according to her carved inscriptions, sent to Punt an expedition consisting of five ships which returned with valuable woods, resin and frankincense, ebony and ivory, gold, long-tailed apes, greyhounds, leopard skins, and natives of the country with their children. The carvings reveal the natives as Negroes like Hottentots and Bushmen, thick-lipped and steatopygous (Herrmann, 1954). Other carvings indicate that Pygmies, prized in Egyptian courts, were probably taken in the course of overland expeditions to the south (Bontemps, 1948). These facts further testify to the close commercial relations between Egypt and the Central African home of yaws.

To reach Punt the Egyptian ships sailed from Red Sea ports into the Indian Ocean and around the Horn of Africa. How far down the east coast Punt lay is not known, but the mention of gold and silver and especially of antimony suggests present-day Tanganyika, Katanga, and Northern Rhodesia (Sutherland, 1959). Antimony was a prized cosmetic for eye-shadow among the Egyptians as it is to this day among the Arabs (known as *kohl*), and its only source in that area at that time lay 300 miles up the Zambesi River (Herrmann, 1954).

Pre-Christian Slave Traders in Ethiopia, East Africa, and Arabia

The Sudanese kingdom of Kush was a power in the 8th century B.C. The Kushites, who were Hamites with a Negro component, migrated west along the corridor to Lake Chad (Davidson, 1959). At this time Ethiopia and Arabia were practically one country; Ethiopia still remains strongly Semitic as well as Hamitic. Migrating Arabs came from the east across the Red Sea or into the Horn (Linton, 1955), giving the Ethiopians the horse, camel, and grape, receiving in return coffee and Negro slaves. Ethiopia was always a collecting point for Arabia-destined slaves from Central and Western Sudan (Simoons, 1960). Burton in the 19th century said they were shipped across the Red Sea by night in Arab dhows capable of carrying 200 head, to be distributed to Mecca and other parts of Arabia through channels in Yemen (Burton, 1961). This traffic is said now to have ceased (Greenidge, 1958).

South Arabians came across the Red Sea from Yemen in 1000–400 B.C. and founded the Semitic city of Axum which at its peak in the 6th century A.D. was the richest port of Arabia, commercially related to Persia, Ceylon and China. During the

first seven centuries of the Christian era Axum handled a stream of exports from Central Africa including gold, ivory, and slaves. Later, in the 9th and 10th centuries, the kingdom of Ethiopia took a dominant position in the slave traffic (Simoons, 1960). Much of that country to-day is characterized by endemic treponematosi (Guthe, 1949). The latitude is that of yaws but the altitude is such that in the cooler, dryer air the lesions are those of endemic syphilis.

In contrast to the treacherous currents and tempestuous weather of the Atlantic coast, the east coast of Africa is relatively benign. Arab commerce with this coast has been going on for 3,000 years, for the Arabs early learned to count on the regularity of the monsoons. These blow from Africa to India in summer and the reverse in late autumn, so that even small ships can make the round trip safely within the year. Sabaea in southern Arabia and Oman near the entrance of the Persian Gulf were seafaring nations for several centuries of the pre-Christian era, trading between India and Africa. Their dhows could sail directly across the Indian Ocean between Calicut on the Malabar coast and Zanzibar on the African coast, a distance of over 2,000 miles; or they could sail to the Horn of Africa and the entrance to the Red Sea, about 1,500 miles (Ommanney, 1956).

The Arabs planted colonies of their people on the African coast, creating by infiltration an admixture of blood and culture that characterizes it to this day from Somalia to the Mozambique Channel. The inhabitants speak Swahili which, like their blood, has elements of Arab, Hamite, and Negro (Farwell, 1957). Slaves and ivory were always the trading attractions of the east coast, brought from Central and Eastern Africa (Anstruther, 1957) where treponematosi is known to have been endemic. Since Zanzibar (meaning Negro-land: Burton, 1961) was the chief entrepôt and the Arab dhows the exclusive carriers, it followed that this little island was usually related politically to one or other of the Arab countries (Ommanney, 1956).

Negro slaves became so numerous in Arabia at the end of the 7th century A.D., and so discontented with their lot, that they staged a series of revolts that lasted off and on for almost 200 years (Davidson, 1959). The culmination was a slave-war, called the revolt of the Zanj, which broke out in 869 among the Negroes that had been imported from East Africa to work the salt mines of southern Iraq. "For 14 years they drenched Iraq in blood, conducting a real war of manœuvre which at one moment made them the actual masters of the Babylonian provinces which they subjected to a frightful pillage and plunder." The end came in 883 "with the storm-

ing of the rebels' capital . . . on the Tigris . . ." (Gabrieli, 1963).

In 1835, one-third of the population of Oman was Negro. In 1950, it was estimated that there were at that time between 5 and 7 hundred thousand slaves in Saudi Arabia (Greenidge, 1962). The slaves that were brought from Africa across the Red Sea and those that reached Arabia from Zanzibar have done their part to make the region of south-western Asia a second home of treponematosi.

The Far East and Madagascar

Arab ships went on to Ceylon and Sumatra—about 1,500 miles of open sea—and thence to Malaya and China, where their offerings of ivory and Negroes were in demand (Herrmann, 1954). China's maritime contacts with the West were mainly due to the enterprise of Arab seamen (Debenham, 1960). Beginning about A.D. 300, the Arab colony in Canton became so large and strong in the next 400 years that it once attacked and plundered the city (Herrmann, 1954). Since Negroes were especially sought after by wealthy Chinese, the Arabs maintained a stock of blacks in Canton from 870 onward (Davidson, 1959). So much porcelain was brought from China to East Africa in trade that it is said the buried history of Tanganyika from the 10th century can be written from the mass of broken pieces (Davidson, 1959).

When the Portuguese reached East Africa in 1498 they were surprised to find a complex maritime commerce in being, linking Arabia, India, and the Far East with the ports of Kilwa and Sofala, the termini for slave caravans that tapped the region of the Great Lakes and beyond. It is impossible to imagine that such commerce could have gone on for thousands of years without a simultaneous dissemination of treponematosi by sailors and slaves at the far eastern ports touched by the Arab trade.

Some time before the Christian era certain Malayo-Polynesians from Java and Sumatra, riding the south-east trade winds, traversed 2,500 miles of the Indian Ocean, that most benevolent of the Seven Seas, to colonize Madagascar, bringing with them rice and many Indonesian culture traits (Linton, 1955; Hance, 1958). Their last contingent came not later than A.D. 500, but traders constantly passed back and forth and came up the east coast of Africa as far as the Horn from the 2nd century onward. Hundreds of thousands of Madagascar's present population trace back to those Malaysians, and their tongue, Malagache, is closely related to the Malayo-Polynesian languages (Linton, 1955). A large part of Madagascar's population, however, is Bantu-Swahili

from the adjacent coast (Hance, 1958). Here then, in the relation between Africa, Madagascar and Indonesia, was another significant opportunity for the dissemination of treponematoses.

The Mediterranean: Greece and Rome

The story of the diffusion of treponemal infection by way of African slaves concludes with the countries of the Mediterranean. To the Greeks and Romans (Grant, 1960), who commonly knew Negroes as slaves, black men were "Ethiopians", so-called in the belief that their dark colour was due to sunburn*. To them, Ethiopia was a geographically ill-defined territory in Equatorial Africa mentioned by Herodotus, who also related how the Libyan Garamantes, south of the Fezzan, in their horse-drawn chariots, used to chase and capture Negro slaves. Homer told the story of the Pygmies and the storks, and both Aristotle and Pliny referred to the Pygmies. Aesop, author of the Fables, was probably so named because he was a Negro slave (Bontemps, 1948). From the fall of Carthage (146 B.C.) to the fall of Rome (A.D. 476) the Romans explored the Sahara, the Sudan, Lake Chad, and the basin of the Niger (Bontemps, 1948).

When North Africa became Moslem (c. A.D. 700) the Arab-Berber cities of Tunis, Algeria, and Morocco engaged in brisk commerce with Sicilian Norsemen and the mercantile cities of Spain, Provence, and Italy, in spite of recurring intervals of war (Herrmann, 1954). African exports to Europe included gold, pepper, ivory, ebony, and black men; during the centuries of the Crusades the use of Negro slaves spread and became a fashion in Europe (Major, 1877). Moorish armies were constantly replenished with sub-Saharan recruits (Bontemps, 1948). The admixture of Negro blood is a significant feature of the modern Berbers, Kabyles, and Moroccans (Coon, 1954).

Numerical Estimates: 100,000 Million Africans

Thus, for over 2,000 years, sub-Saharan Africa furnished slaves to North Africa, Europe, Asia, and—later—the Americas; for Negro slavery is older than the pyramids of Egypt or the ziggurats of Sumeria (Debenham, 1960). In concluding this survey of Negro dispersion, the following scattered numerical estimates are offered, with the *caveat*, however, that some figures are less authentic than others, and none entirely escapes the hazards of a conjecture.

The first Negro slaves reached Brazil in 1538; from 1575 to 1591, 52,000 slaves were sent from Angola alone to Brazil and the Spanish Indies. The number continued to rise so that, by 1617, 28,000 slaves were being shipped annually from Angola and the Congo. In the 16th century, 900,000 slaves were shipped to the New World from all parts of Guinea; the figure for the 17th century was 2,750,000. As to the 18th century, Liverpool ships alone sold a total of 303,737 slaves in the West Indies during the 11 years, 1783–93 (Mannix and Cowley, 1962).

As late as the 19th century, 4 million were taken across the Atlantic, many from Nigeria as a result of the civil wars in that country. As late as 1847, even after slaving had been outlawed by every Western nation, 85,000 slaves from West Africa were delivered to sugar plantations in Brazil and Cuba (Crowder, 1962).

In general, so great were the hazards of the slave traffic that estimates of the proportion between those originally taken captive and those who eventually reached the Americas range between ten to one and five to one (Weatherford, 1954). Certain portions of the savanna and forest country of Africa have never recovered from the wholesale depopulation (Harris, 1933; Kimble, 1960).

Crowder records an estimate that a total of 24 million slaves were exported from West Africa and Angola, of whom 15 million survived the journey; Greenidge (1958) estimated that 12 million African slaves arrived in the Americas. In view of some other estimates, these can be regarded as conservative.

The slave ships at least carried ship's logs and cargo manifests; the American plantations and slave markets kept records of purchase and sale. It is possible, therefore, for historians to get a good idea of the numbers involved; but what is one to make of the uncounted coffles in the past 2 or 3 thousand years that dragged across the Sahara, were pushed along the savanna into south-west Asia, or were packed into the dhows along the East Coast? Who can estimate how many millions they numbered? Only Weatherford (1924) has attempted a serious estimate of the number of Negro slaves taken out of Africa to other parts of the world in historical times. He believes the total exceeds 100 million souls.

Subsequent Course of Treponematoses

Special studies have been made of the diseases which these millions of people disseminated to the world outside Africa, numerous viruses and bacteria, strains of malaria, and a congeries of intestinal parasites. As to treponematoses, there is no dispute about the fact that in the form of yaws (and endemic

* Lat. *Æthiops*. Gr. Αἰθίοψ from αἴθω-ΕΙΩ to burn, and ὄψ face (O.E.D. 1960).

syphilis) it was one of the most common diseases of the Negro slaves bound for the Americas. It is also possible, therefore, to assert confidently that it was also one of the commonest diseases of those Negroes who, in the course of 2 or 3 thousand years before the discovery of the New World, were driven from the same African region to Iberia, North Africa, south-west Asia, and the East. What became of all this exported treponematosi?

Some of it, as in Brazil and Jamaica, remained more or less unchanged as yaws. Some of it, as in Ethiopia and Arabia, contributed to the endemic syphilis of native villages and nomadic tribes (Guthe, 1949; Ghoroury, 1954; Hudson, 1958b). The treponematosi that came north since prehistory to the slave markets of Barca (Libya), Kairouan (Tunis), Algiers, and Morocco, accounts at least partly for the great incidence and unusual characteristics of the "Arab syphilis" described by Lacapère (1923). It has also been called "exotic syphilis" (Baylet, 1954). The yaws imported into Spain and Portugal between 1450 and 1550 doubtless changed to venereal syphilis in the cooler, dryer climate among the relatively clean and clothed people of the Peninsula.

The same process went on in the southern states of the American Union. The first slaves were brought to the English colonies in 1619, the year before the *Mayflower* arrived. In 1714, their slave population was 59,000; in 1754, 298,000; and in 1790, 697,897, almost all below the Mason-Dixon Line. Virginia imported 52,504 Negroes between 1710 and 1769, of whom 86 per cent. came directly from Africa. During 45 years in the middle of the same century, South Carolina imported 67,769, of whom 96 per cent. came straight from Africa (Mannix and Cowley, 1962).

Early in the 19th century yaws was said to occur in Mississippi and Louisiana in a modified form "commonly mistaken for syphilis" (Blanton, 1931). It was said to be a contagious disease communicable by contact "among those who greatly neglect cleanliness". Children as well as adults were subject to it, and in certain cases it was acquired by members of the white race, among whom it was said to resemble pseudosyphilis, attacking the nose, throat, and larynx like syphilis "without, however, having appeared on the genital organs at all". Drugs believed at the time to be of value against syphilis, such as deuto-chloride of mercury and guaiacum with dulcamara, were recommended for treatment (De Bow, 1852).

Thus the change of climate, the economic improvement of the Negro, and the rising level of public health in the Southern States first converted the yaws of the newly-arrived slaves into the endemic

syphilis of the plantations, and this was followed by a transitional stage shared by non-venereal and venereal syphilis. At the present time endemic syphilis as well as yaws has disappeared from the South.

Summary

The 100 million Africans, who in the course of history have been taken to other countries as slaves, came from those regions of the continent that are notorious for treponemal infections. Testimony is clear that many of these slaves in historical times had treponematosi. Equally firm is the assumption that the slaves captured in previous periods were also thus infected.

The endemic treponematosi thus disseminated remained as yaws in those countries that presented human society and climatic conditions in terms comparable to those of Central Africa. It was changed into endemic syphilis in countries where human beings inhabited cooler and dryer areas but still neglected personal cleanliness. Finally, when it was introduced by the slaves among clothed and relatively clean people with the sexual *mores* of civilized life, it was converted into venereal syphilis.

Incidentally, the 44 sailors and 10 West Indians who are said to have brought syphilis to Europe in 1493, when regarded from this wide historical perspective, are clearly perceived to be of the utmost irrelevance, an *a posteriori* misapprehension of medical history and one of its hoariest risibles.

Evidence here presented shows that the currents of Negro dispersion in the history of the world have been of such a geographical sweep and numerical magnitude that, once treponematosi is assumed historically in sub-Saharan Africa, it follows that Negro slaves could not have failed to disseminate the disease over the globe.

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Les tréponématoses et l'esclavage africain

RÉSUMÉ

Les cent millions d'africains qui ont été amenés à l'étranger comme esclaves sont venus des régions où les tréponématoses sont indigènes. On constate non seulement qu'un grand nombre de ces esclaves des temps historiques étaient infectés, mais aussi que ceux pris auparavant étaient aussi atteints.

Les tréponématoses endémiques ainsi répandues survécurent sous la forme de pian aux pays où la civilisation et le climat furent à peu près les mêmes qu'en Afrique équatoriale. Dans les régions plus tempérées où les habitants étaient encore sauvages et malpropres les tréponématoses sont devenues la syphilis endémique. Enfin, parmi les gens qui s'habillaient et se tenaient propres et dont la vie sexuelle conformait aux coutumes civilisés, elles sont devenues la syphilis vénérienne.

Les 44 matelots et les 10 indiens occidentaux qu'on dit responsables d'avoir apporté la syphilis en Europe en 1493 n'ont aucune importance lorsqu'on les regarde dans la perspective historique; ils ne représentent qu'une vieille plaisanterie de l'histoire médicale.

L'auteur montre que la distribution des nègres dans l'histoire mondiale fut si vaste et leur nombres si grandes que, si l'on accepte l'hypothèse de l'existence des tréponématoses au Sud du Sahara, on doit admettre que les esclaves nègres n'auront pu que disséminer ces maladies dans le monde entier.