The Leprosy and Global Situation

As per the Global situation of the leprosy disease, it must be stated at the outset that there are no accurate statistics available. It is also difficult to compile global estimates when the quality of data varies considerably from and within regions. Enumeration of cases in some regions is less complete than in others and registered cases represent only a proportion of total estimated cases. The WHO’s current global situation is between 10-12 million estimated cases. 10 million is an estimate that may be considered conservative by many, who are more likely to place the figure nearer to 20 million.

There is a major difference between registered and estimated cases. The WHO believes that only about 50% of the total estimated cases are ever registered. Registered figures in themselves have to be carefully considered. Patients rendered inactive may continue to be retained on Registers for a variety of reasons.

The figures of registered cases are therefore only a part of the total scenario. Equally important is the prevalence rate, which demonstrates the intensity of the disease in the total population. A prevalence rate of 1 case per 1000 persons is considered to be a serious public health problem. It is estimated by the WHO that approximately 1.6 billion people live in areas where prevalence is over 1 case per 1000. Such areas constitute serious public health problems, and the populations in these areas are considered to be at risk.

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1 Noordeen S.K. and L. Lopez Bravo “The World Leprosy Situation”.
III(a). GEOGRAPHICAL DISTRIBUTION (MAP : 1)

The distribution of leprosy is not uniform. There is wide variation also in its clinical manifestations in different countries. Major differences are apparent at all levels viz., continental, national, regional, village and even at home level.

The distribution of leprosy by WHO regions can be seen in Table-I.

**TABLE – I**

<table>
<thead>
<tr>
<th>W.H.O. Region</th>
<th>Estimated No. of cases (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa (1975)</td>
<td>3.5</td>
</tr>
<tr>
<td>America (1975)</td>
<td>0.4</td>
</tr>
<tr>
<td>South-East Asia (1981)</td>
<td>5.35</td>
</tr>
<tr>
<td>Europe (1975)</td>
<td>0.025</td>
</tr>
<tr>
<td>Eastern Mediterranean (1981)</td>
<td>0.25</td>
</tr>
<tr>
<td>Western pacific (1975)</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>11.525</td>
</tr>
</tbody>
</table>

**African Region**

The African continent has an estimated case load of 3.5 million patients. This indicates an overall prevalence rate of 8 per 1000 in a population of 45,00,00,000. The prevalence rates in Africa are among the highest in the world, though in terms of absolute numbers the figures are lower than in South East Asia, due to the sparse population density. In endemic areas, the prevalence rates vary widely, ranging from between 28 to 74 per 1000. The distribution of Leprosy in Africa is characterized by high prevalence rates combined with a low proportion of lepromatus cases which often ranges between 2% to 5%. The disease is mainly prevalent in Western, Central and Eastern Africa respectively with 7.4, 4.7 and 2.8 per 1000 population and with very low
prevalence rates in northern and Southern Africa with 0.6 per thousand population as per the statistics of 1975.

**South East Asian Region:**

The South East Asia has an estimated 5.3 million patients. This tropical and sub-tropical belt, which extends from sub-Saharan Africa to South East Asia is considered to be the ancestral home of leprosy, where the disease can be traced back to 2,500 years. It accounts for nearly 80% of the world prevalence pool. India with approximately 4 million patients has more than 75% of the total case load in South East Asia. The other countries in this region where leprosy is an important public health problem include Bangladesh with registered patients of 1,50,000, Burma (7,00,000) Indonesia (2,50,000) Thailand (1,40,000), Nepal (1,00,000), Bhutan (10,000), Maldives (2,000) and Sri Lanka (14,000).

**Western Pacific Region:**

The Western Pacific Region has approximately 2 million patients. Endemic countries in this region include China, Vietnam, Philippines, Korea hoas, South Pacific Islands etc. Leprosy has been existent in China for more than 2000 years, while it was introduced into the South Pacific Islands only during the last 200 years, mainly by Chinese immigrants. In some instances this has led to epidemics lasting several decades. Leprosy was introduced to the Australian main land recently i.e., in the middle of the 19th century, and it still continues to persist in aborigines in the Northern region of this content.
American Region:

Leprosy was introduced into South and Central America about 400 years ago, after the arrival of settlers from Spain, Portugal, Holland and France. Slaves imported from Africa at a later period were also responsible for the spread of leprosy in this sub-continent. The most important focus today is in the South American Amazon region, a recent one, since it was populated only in the last quarter of the 19th century. The estimated case load in this sub-continent is approximately 400,000. Brazil with 242,273 patients and a prevalence rate of 2.2 per 1000 accounts for more than 60% of the total number of cases in Latin America and the English Caribbean.

Leprosy was introduced into North America in the 17th and 18th Century by settlers from endemic countries and by slaves from Africa. The disease however, was never able to spread to appreciable extent in the new world. A few endemic foci still continue to exist in Louisiana, Florida, Texas, California and Hawaii. There are Approximately 4000 registered patients in U.S.A., the majority of them being migrants.

Eastern Mediterranean Region:

The Eastern Mediterranean region has an estimated 250,000 patients. Leprosy has probably existed in the Mediterranean basin for more than 2000 years, and still continues to persist though at a low and declining prevalence. It still continues to be a public health problem of some significance in Egypt, Afghanistan Somalia, Sudan and Yemen. In other countries of the region leprosy foci exist but do not constitute a serious public health problem.
European Region:

In Northern Europe, leprosy was widespread a 1000 years ago as far north as the Artic circle. From the 13th century it declined progressively towards extinction. In South Europe it still however continues to persist in some of the less affluent countries of this region, at a very low level of endemicity e.g. Spain, Portugal, Greece, Italy and the Balkan states. The estimated case load is only 25,000 patients. The decline of leprosy in Europe has been attributed to the Genetic selection of the population, health consciousness of the people, socio-economic conditions, the regid segregation measures etc.

III(b). HISTORY OF LEPROSY

Whether and where leprosy existed in ancient times is difficult to determine. In this connection it may be noted that discussing the meaning and significance of leprosy, it might be well to look into the question concerning the period at which leprosy, as known today, was first authentically described.

The Early Evidences from Archaeological Excavations

The evidences of recent excavations in the Egyptian Oasis of Dakhle have disclosed four leprous skulls of the ruling class buried in the second century BC. No sign of leprosy has been recorded in all the skeletons that are unearthed from 6000 BC onwards at Egypt or in skeletons that are recovered at Lachish dated to 700 – 600 BC.
In upper Egypt, the earliest skeletal remains showing indubitable signs of leprosy are recovered from two mummies, found in a burial ground in El-Bigha to a datable context of 6th Century A.D. The hands, the feet, the bones of extremities and the skull of these mummies showed clear evidence of mutilating leprosy2. Thus, the skeletal evidences from the excavations for leprosy at Egypt are not older than 300-200 BC.

But it is not the case with India, when Robinson and his colleagues reported leprosy evidence in a skeleton recovered from an excavation conducted at Balathal of Rajastan3. The skeleton is identified to belong to Chalcolithic culture and datable to a context of 2000 B.C.4 The excavators identified the skeleton as a middle aged adult male which demonstrates pathological changes in the rhinomaxillary region, degenerative joint disease, infectious involvement of the tibia and injury to the peripheral skeleton. The excavators are of the opinion that the presence and patterning of lesions as a diagnos of leprosy5. The solitary skeletal evidence from India requires more data for consolidation and confirmation of date of leprosy.

LITERARY EVIDENCES

Near East

It has been claimed that leprosy was in existence in Babylonian times; but Oppenheim⁶ quotes the word ‘tzarrath’ which has been translated as leprosy as ‘covered with dust’ or ‘scaly’. The Akkadian word ‘epqu’ which was translated as leprosy in the Chicago Assyrian Dictionary also means scaly; as does the word Saharsubbu; and even the statement that leprosy was described in the Ebers Papyri. The date of the Ebers Paye was in the Eighteenth Dynasty or about 1300-1000 BC. Rogers⁷ refers to an Egyptian record of 1350 BC of leprosy among Negro slaves from the Sudan and Dafur, but if his source is the Ebers Papyri one can legitimately doubt the validity of this reference. Hippocrates the father of modern medicine was born in 467 BC. From a study of his translation on certain ancient medical works, some scholars expressed doubts whether he really recognized leprosy. Lucretius, the great philosopher (91-55 BC), in his De Natura Rerum makes reference to a possible source of the disease when he states:

‘High up the Nile midst Egypt’s Central plain
springs the dread leprosy and there alone’

In this connection, Lowe\(^8\) states that; ‘unless more recent work has produced new evidence, it appears that no definite proof that leprosy was common or even known in ancient Egypt. It would, therefore, appear very difficult to substantiate the existence of leprosy in early times in the Near and Middle East.

The land between the Euphrates and Tigris is traditionally the cradle of the human race and archaeological discoveries have indicated the tremendous wealth of socio-economic and religious aspects of Mesopotamian civilization buried under the dust of the cities such as Assyria, Media, Babylonia and Persia. These cities are the ancient homes of civilization and it is reasonable to assume that at the time of the Patraiaarchs, Caravan routes existed to India and China. Therefore, because of the influence of these ancient countries on the Promised Land, it would be of great interest to know whether there was any evidence of the existence of leprosy in West Asia from the time of Moses to the time of Lord Jesus Christ.

**South East**

It is interesting to note that there does not seem to be any accurate account of leprosy before about 600 be either in India or in China. Leprosy is mentioned in the Adharva Vedic writings\(^9\) of India as Kusta in the Vedas and Rogers and Muir\(^10\) place it

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\(^10\) Rogers, L. and Muir, E. Leprosy, 3rd Edn., John Wright & Sons Ltd., Bristol, 1946.
to a datable context of 1400 BC. Both these writers and Lowe\textsuperscript{11} are not really certain that Kustha meant leprosy as it appear to day. Darmedra\textsuperscript{12} states that “in Sushruta Samhita (600 BC) one finds a reasonably good account of the clinical features and treatment of the disease”. The same authority states that ‘in this ancient book references to leprosy are made under Vat Rakta or Vat Shonita and Kushtha’. Lowe\textsuperscript{13} mentions that some writers maintain that ‘the Laws of Manu contain definite instructions about the prophylaxis of leprosy’. The date of these Laws has been given as between 1300 BC and 500 BC. He further continues to say: ‘Possible references to leprosy are made in four places. The Sanskrit word Shitri almost certainly meant leucoderma, and Kushtha meant skin diseases in general prominent among which was possibly or probably leprosy.

**Far East**

So far as China is concerned, the authenticated references to leprosy appeared about 600 BC. It is claimed that a disciple of Confucius (Circa 551-478 BC) named Pai-Nice suffered from a disease resembling lepromatous leprosy which was known at that time as lai, li and Da Feng\textsuperscript{14}. Ma Haide gives Da Feng as the early name in China. The most authentic account of leprosy is found in the book entitled Nei Ching

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\textsuperscript{12} Dharmendra, N.S. (1960) Notes on Leprosy, Published by Ministry of Health, Government of India, New Delhi.


by one Huang Ti. The date of these writings is given between 230 and 1200 BC. Therefore, it can be assumed that leprosy is an ancient disease in China, and certainly existed before 600 BC, and possibly the history of this disease extends to 1000 BC or more\textsuperscript{15}. Upto the present, there have been found no material evidence or manuscripts which can definitely be dated before 600 BC or which have not been amended by the work of later date.

**Leprosy in old Testament**

It is interesting to note that there is no authentic evidence of the existence of leprosy in Egypt at the time of the bondage of the children of Israel. Nevertheless, even assuming that it did, there is no evidence that the diseases, described in the Levitical record included true leprosy\textsuperscript{16}. If classical leprosy had occurred among the tribes of Israel, there surely would have been a more accurate description of it in the Bible. Because of the absence of any such disease in West Asia it seems reasonable to assume that, in those early days Lot and Abrham (Gn.13:11-14) have chosen respectively the Jordon plains and unpromising lands away from the cities between themselves.

Further during the time of the Egyptian Captivity the children of Israel were segregated in the land of Goshen and there was no mention of the existence of leprosy in the Bible between either the slave people of Israel and the proud Egyptians.


The first mention of leprosy in old Testament is found in Exodus 4:6, where the Lord commanded Moses to put his hand into his bosom, and when he took it out, “behold, his hand was leprous as snow”. Frequently in the description of leprosy in the old Testament, the disease is referred to as a blemish “as white as snow”. Other references are found in Numbers 12:8-10 with reference to Miriam and Aaron’s episode. The verses 9 and 10 states that “the anger of the Lord was kindled against them, and Miriam became leprous, white as snow”. In neither of these two references to leprosy, could it possibly have been the disease as we know it today, for the lesions of leprosy are never white. A further reference to ‘leprosy’ is found in 2 Kings 5:27, with regard to Naman, where it is mentioned that “he went out from his presence as leper as white as snow”. In this connection it is interesting to note that leucoderma in India during ancient period is referred to as ‘white leprosy’, and those who suffer from it are fearful due to disfigurement. Probably the white leprosy referred to in the Old Testament might be the same as leucoderma of Ancient India as there exist proximity and close contacts between India and Israel during the period under reference.

Turning to the description of leprosy in Leviticus 13, it is interesting to note that there is not even one single sign by which one could attribute to leprosy as we know it today. In the first place, it should be noted that all the references to leprosy in Leviticus 13 are preceded by a definite or indefinite article. In Leviticus 13:2, “like the plague of leprosy”. The phraseology occurs in verses 3, 5, 6 and in verses 8, “it is a leprosy”, in verse 11 ‘it is an old leprosy”, and in verse 12 “and if a leprosy breakout’.

17 Ibid.
In other words this description suggests that ‘the plague of leprosy’ does not cover one single disease, but blemishes caused by any one or a whole group of diseases which cause a person disfigurement and identified as “ceremonially unclean” before the Lord. Further, one reads that a person who is suspected of having ‘a leprosy’ is frequently separated from the camp for a period of seven days. Leviticus 13:6 reads, “And the priest shall look on him again the seventh day: and, behold, if the plague be somewhat dark, and the plague spread not in the skin, the priest shall pronounce him clean, it is but a scab”. But in verses 7 and 8 the description obviously refers to a deep-seated ulcer, which is much more than a mild break in the skin and may be of the nature of a phagedenic ulcer, which in the period described, would spread and not heal would therefore be considered to be ‘a leprosy’. There is an interesting reference in verse 13 to the plague having ‘all turned white’. This would suggest that albinism was not classified as ‘a leprosy’, but the whiteness of psoriasis was probably included because it refers to the fact of ‘raw flesh appearing’.

There are two details in the Levitical record which cannot apply to leprosy – its ‘whiteness’ and the afflection of the scalp. In the first place leprosy lesions are never white. In the second place, leprosy of the scalp very rarely occurs, and does not occur apart from advanced lepromatous leprosy. In the old Testament the only possible description that could fit leprosy is the reference to Uzzaiah, where in

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18 The King James version of the Holy Bible Leviticus 13, 14 the word “leprosy” is mentioned as it is at several places while in the new International version of Holy Bible, the leprosy is mentioned, “as several skin diseases”. The foot note of N.I.V. provides the explanation that “Traditionally leprosy; the Hebrew word ‘tsarath’ was used for various diseases affecting the skin – not necessarily leprosy”.

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2 Chronicles 26:19, it states: “the leprosy even rose up in his forehead before the priests”. This could be a form of true leprosy because, in Africa particularly, the forehead is a predilection site for an initial lesion of leprosy. However, it could be a patch of leucoderma for, in the old Testament, leprosy is always mentioned as “white”.

Hence, it may be presumed that the Levitical descriptions of ‘leprosy’ may be related to one or other of the various skin diseases, but not to classical modern leprosy as we see it today. Further, nowhere in the Levitical record there is any description that leprosy is associated with anaesthesia, which is also a common feature in the modern leprosy. The laws of the cleansing of the ‘leper’ are so meticulously laid down that one is bound to conclude that during the days of Old Testament provision was made for cleansing of the patient who had the plague of leprosy’ and that healing of the disease was a common phenomenon.

Simons\(^{19}\) is of the opinion that ‘Old Testament tsara’ath was not present-day leprosy’ and that ‘the word was a collective noun for numerous skin diseases’ Muir\(^{20}\) also expressed that ‘The highly contagious diseases are described in the Jewish Law, which has nothing to do with leprosy. Therefore, it is interesting to note that Tas and Israeli, the Biblical scholars stress ‘that at the time of Septuagint the word lepra meant nothing but a symptom: scaled skin. The Hebrew word Tsara’ath was first found in the Latin vulgate translation where the Greek word ‘lepros’ meaning scaly was used.


Further, the word leprosy was used in the Old Testment English translation to identify its mysteriousness, its mutilating power and its incurability as a symbolic of all that was dreadful to human beings. Hence, the modern disease of leprosy bears no resemblance to that described in the Old Testament and in any case only a small fraction of leprosy cases among the total who are afflicted can be described as loath some to look upon. It must therefore be concluded that historically, medically, exegetically and etymologically there is no justification for applying the Old Testament conception of leprosy to the disease as it is known today by that name. The Jews therefore may not be regarded as the originators of the leprosy concept.

**The New Testament and Leprosy**

But in this connection, it may be noted that the association of a chronic skin disease with Mosaic ideas of ceremonial uncleanness, sin and punishment was widely current during the time of Jesus Christ. Those so suffering were related to the uninhabited border country (Luke 17:11); they regarded themselves and by society as “unclean” (Mark 1:42, Luke 17:14). There is another reference in Gospels to leprosy and that the statement that Jesus visited the house of Simon, the leper (Mathew 26:6, Mark 14:3).

The word Lepra is the one used by the synoptic writers Mathew, Mark and Luke in their Gospels as the equivalent of the everyday Colloquial Armaic. In the Palestine of Jesus times, the word probably included the ritualistic over tones of the

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original Hebrew and its association with sin, divine displeasure and divine power and punishment. The accepted medical term for true leprosy at that time were Elephantiasis, Graceorum lepra Arabum, but the Greek equivalent of neither of these appears in New Testament.

Turning from the sacred writings to the secular; the one confirms the other. History also provides information about royal lepers such as Bruce of Scotland, Louis of France, and Henry IV of England. The pathetic story of the leper is a fitting theme alike for poem and romance. Ben Hur brings the poor sufferers to proper notice in the most startling manner. R.L. Steevenson gives a vivid word picture of the leper of the Middle Ages as “he steals through the forest in the early morning, clad in hooded gown and wooden clappers”. The gifted pen of Kipling that portrays so many scenes in India gives a graphic description of the displeased leper. From earliest ages to the present day the poor victim, from the very nature of his disease, is probably the greatest sufferer of humanity.

True Leprosy in the west

The earliest written records of a disease closely resembling – and probably identical to modern leprosy in the lands of the West are from Greece, and date from about the turn of the third century BC\textsuperscript{22}. It is more than likely that the soldiers of Alexander the Great, returning from the Indian Campaign about 327-326 BC, unwittingly brought back with them Mycobacterium lepraе together with the booty of

\textsuperscript{22} Andersen JG 1969 Studies in the mediaeval diagnosis of leprosy in Denmark. Danish Medical Bulletin (Supplement) 16:1-144.
silks and spices from the fabulous Orient. Andersen has collected data from various Greek sources that made the suggestion very plausible. The observant and knowledgeable Greek physicians were at this time mentioned it as a ‘new disease’. In fact had they seen it before, it is tolerably certain that they would have recognized it. ‘The original records have been lost’, writes Andersen23, ‘but Storation, a disciple of the Alexandrian physician Eristratos (C.300-250 BC) is quoted by Rufus of Ephesus (AD.98-117) as giving an accurate discription of low resistant leprosy’. This new disease was called Elephantiasis. Later, the word Graceorum was added, to distinguish it from elephantiasis Arabum which we know today as bancroftian filariasis. To confuse the issue still further, Lepra Arabum was the equivalent of Elephantiasis Graceorum, popular descriptive appellations were leontiasis and salyriasis. Aristotle (384-322 BC) mentions this later24.

There has been some speculation that Greek merchants following the long Caravan routes overland to the East may have brought leprosy back with them but no firm evidence exists. Once leprosy had established itself in Greece, however, because of the maritime connections of Greek merchants and sailors, it spread slowly to the lands of the Mediterranean littoral. When Rome replaced Greece as the major military power in the region, the smouldering leprosy endemic in Italy was augmented by the

23 Ibid.
returning troops of Pompey who had been fighting in the Egyptian campaign (62 BC), according to Pliny the Elder (AD 23-79).\textsuperscript{25}

\textbf{The Crusades}

The influence of the returning crusaders who had caught leprosy in the endemic countries of the Ottoman Empire in which leprosy was prevalent, seems to have introduced leprosy in Southern Europe. A serious theological threat was posed by the fact that Christian warriors engaged in crusades had attracted Episcopal blessing, somehow contracted the leprosy disease which was widely regarded as divine punishment for their sins. Their return from 1096 onwards from the Ottoman Empire was coincided with a wave of Christian charity which has created alms houses and hospitals for those afflicted by leprosy. Royalty and high-born ladies vied with each other for the privilege of kissing the ulcerate feet of ‘christ’s poor’ and showing them special compassion.

The example of St. Francis of Assisi in his attitude to sufferers from leprosy generated an aware of Christian concern throughout the western world, inspiring both high and low to care for the neglected and shunned victims of the disease, and thus helped to transform conventional attitudes towards them.

\textsuperscript{25} Ibid.
III(e). LEPROSY IN EUROPE

The leprosy endemic in western Europe reached its peak in the thirteenth and fourteenth centuries. The total numbers of leprosy victims and prevalence rates are, of course, quite unknown, estimates varied widely; from very high, making leprosy the commonest, and most feared, disease after bubonic plague; to about three or four leprosy victims per thousand. This situation brought among people a derivative sense that leprosy could be a calamity, a plague or visitation. The medieval church too acted as the sole arbiter for diagnosis and care of the leprosy victims and established a large number of Hospitals and Lazerites. Devoted nuns and monks organized these institutions. A curious ambivalence prevailed, a mixture of compassion and condemnation, of Christian charity and loveless severity.26

Meanwhile, leprosy continued to spread north west wards in Europe, making considerable inroads in Scandinavia, Finland and Iceland. It edged north to Scotland while declining South of the border. The statistics from Norway are particularly impressive and complete. Here, the endemic reached its height in the middle of the 18th century, being especially severe along the west coast which had previously many maritime and commercial contacts with England. The social conscience of Norway was probably responsible at least partly for admitting a large proportion of patients as in-patients in four newly built segregation hospitals in 1856. These hospitals in course of time have accommodated nearly 740 patients. Further steps were taken to discourage

procreation and elimination measures of leprosy disease. With the changing socio-
-economic and cultural conditions, the stage was set for a progressive reduction in new
infections. In less than 125 years, the total prevalence of leprosy disease fell from thirty
per thousand in some districts to almost nil, and from 239 patients registered in the year
1857 to none in the mid-1920s.27

The church, too encouraged the cult of associating leprosy with divine
punishment. In the art, that is portrayed in the medieval churches too, leprosy is
frequently represented by hideous and repulsive features. St. Lazarus became the
patron saint of leprosy sufferers, though it is not explained how he was allowed to beg
at the gate of the rich man if he was suffering from a ceremonially unclean condition
(Luke 16.20). The Patriarch Job also appears in medieval art as suffering from leprosy,
though there is no suggestion in the Book of Job that his ‘sore boils’ were due to
leprosy (Job 2-7).28

In Europe, to judge from the number of hospitals set aside for leprosy
sufferers, it can be presumed that the disease must have been widespread. Despite
various Draconian measures, such as burying or burning victims of leprosy alive or
allowing them to starve to death, the disease continued to spread.29 Though not
common in whole of Europe, in Britain at several places the leper mass was conducted
to the leprosy patient who in parish church was forced to listen to the solemn cadences

27 Irgens, L.M., Leprosy in Norway: an interplay of research and Public health work.
of burial service read over him to prevent him to enter the church, mill-house, bake
house and his own house to regard himself as ‘one dead’\textsuperscript{30}.

**Legal Enactments**

The earliest legal enactment in which leprosy is specifically mentioned in
Britain is the code of Laws promulgated in Wales during the reign of Hoel upto
A.D.950. Some what later, during the reign of Edgar in England, a law was passed
making leprosy a valid cause for divorce. During the reign of Henry I, probably around
(1000 A.D., a government order by name De Leproso Amaundo was promulgated by
which the movements of those afflicted with leprosy were regulated. But later when
leprosy was still much feared by the people, the Edward III issued in 1346 a
proclamation to the Mayor and Sheriffs of London and expelled leprosy patients from
the city\textsuperscript{31}. Further, several rules and regulations governing admission, conduct dress
and the like were brought into force in the hospitals. Thus the hospitals were
considered a kind of prison, monastery and almshouse combined. The inmates of the
hospitals were forced to make signal of their presence when outside the hospital, by
sounding a bell or chapper; they were also recognized by their special habit, which
varied from country to country. Much controversy has raged about the significance of
the squint windows in medieval churches\textsuperscript{32}. In some countries such as Belgium,
Norway they were built into churches frequented by leprosy sufferers; in others, they

\textsuperscript{31} Ibid.
\textsuperscript{32} Ibid.
may have afforded people who were excluded from participation in the Mass by reason of ‘leprosi animi’. In France also the leprosy was endemic in 13\textsuperscript{th} and 14\textsuperscript{th} centuries and thereby the leprosy patients were kept for treatment in as many as 2000 Lazarites when the disease is in a peak condition.

The reasons for the prevalence of leprosy in Europe in 13 to 15\textsuperscript{th} centuries and its decrease in 17\textsuperscript{th} and 18\textsuperscript{th} centuries is still obscure. The serious famine of 1325-26 followed by the Black Plague must have taken a disproportionate toll of the ill-fed and verminous inmates of the hospices, at a time when general standards of nutrition and hygiene were rising, with a reduction in domestic overcrowding. Some workers have suggested that an increase in the incidence of pulmonary tuberculosis may have played some part in the waning of the leprosy endemic. The real cause, or causes, remain unknown.

It is known that leprosy existed in Britain by the fourth century AD, and the prevalence of the disease increased during succeeding centuries. During the Middle Ages numerous lazar hospitals were founded throughout Britain. A systematic archaeological excavation of the mediaeval Hospital of St. James and St. Mary Magdalene, at Chichester, Sussex, took place between 1986 and 1987. This hospital, one of five in mediaeval Chichester, was founded before 1118 for eight leprous brethren, and the last reference to leprous inmates at this hospital was in 1418. The excavation releaved 330 graves and associated human skeletons, and these are available for study at the university of Bradford. More than 80 skeletons exhibited osseous
pathological changes of leprosy, and these were predominantly from the earlier phase of the cemetery use, the number of leprous skeletons declined progressively during the later phases. The cemetery went out of use during the 17th Century by which time leprosy was no longer exhibited amongst the skeletons.

The last indigenous case of leprosy in Britain was recorded in 1798 when John Berus, a Shetland islander, was admitted to Edinburgh Royal Infirmary. In Western and Northern Europe, leprosy is now an imported disease, but in Southern Europe the disease has persisted to the present day as a minor health problem and is proving difficult to eradicate. Descriptions of leprosy in Siberia and in Scandinavia in the previous century disprove the commonly held view that the disease needs a warm climate in which to flourish.

III(d). LEPROSY IN THE NEW WORLD

It seems certain that there is no artifact or record showing undoubted evidence of leprosy in America dating from pre-Columbian times. There exist, however, some pottery representations, which suggest leishmaniasis rather than leprosy, on ancient water jars found in Peru, Bolivia and Ecuador showing destruction of the nose and lips associated with foot deformities.

The introduction of leprosy into the New world can be traced, first, to the journeys of the Spanish and Portuguese conquistadors into Central and South America

and, second, to the importation of African slaves into these regions and into the Southeran states of what were to become the USA and the Island of the Caribbean\textsuperscript{34}. In countries like Colombia, pockets of leprosy today indicate the places where Spanish soldiers infected some of the local inhabitants with \textit{M. Leprae} years ago. Subsequently, the smouldering and patchy leprosy foci were supplemented by the arrival of further accessions of infection.

**Leprosy in U.S.A.**

In north America, the leprosy is known to exist since 17\textsuperscript{th} and 18\textsuperscript{th} centuries at New Orleans, San Francisco, Charleston, New Brunshrick, and in Scandinavian settlements in the North-Western States\textsuperscript{35}. Its prevalence is so general as to threaten the existence of the nations in the region with one or other causes, but has diminished rapidly in the next century of its existence. Leprosy appears to be confined almost exclusively to the native population in the Sandwich Islands, a few foreigners only being affected.

Within the domain of the United States, leprosy has not at any point of time made active progress. The rapid immigration of persons from Europe, however, introduced into the country a greater or less number of persons in the incubative or doubtful stage of leprosy. On Eastern Coast, such cases are among the Scandinavian


\textsuperscript{35} Ibid.
immigrants, especially those from Norway, where the people have settled chiefly in the North-Western state of Minnesota.\textsuperscript{36}

On the Western Coast, the chief source of the disease seems to be China. A leper hospital has been established at San Francisco, and fifty two cases have been admitted in ten years, all of whom with a single exception were Chinese, and no case has been reported of a native citizen of California acquiring leprosy. Other foci of the disease have been observed at Charleston S.C. and also Louisiana. In the former city, Dr. Geddings has observed sixteen cases in the past thirty-five years, and published a report of the same in the Transactions of the International Medical Congress held at Philadelphia in 1876. Occasional cases have also been reported in the Gulf States during the past and present centuries.

**Leprosy in Canada**

Leprosy has existed 17\textsuperscript{th} and 18\textsuperscript{th} centuries of Gloucester and the North Eastern province of New Brunswick in Canada for many years.\textsuperscript{37} In new Brunswick there have been lepers of French, Scotch, English and Irish descent, and lepers of mixed origin. The disease, in new Brunswick, has occurred among the ordinary working classes of varied means.\textsuperscript{38}

The places where the malady has occurred are rural, with one exception all these places are upon the sea-coast or in close proximity to it. The country is

\textsuperscript{36} Ibid.

\textsuperscript{37} Reports on Leprosy, Enquiring made by Hawaiian Government Canada, New Brunswick, Ottawa, June, 1985, p. 135.

\textsuperscript{38} Ibid, p. 139..
undulating, generally dry, well-drained, well-provided with good water and not at all malarial\textsuperscript{39}.

Persons affected with leprosy are segregated in new Brunswick, and do not communicate freely with the rest of the community when the existence of the disease fully ascertained, and their entry in the Lazaretto has been secured, there has been, however, a few accidental exceptions to this rule, such as the occasional visits of relatives and friends, which are allowed under certain restrictions.

Since the establishment of a Lazaretto, in 1844\textsuperscript{40}, leprosy has been more or less, kept in check, in New Brunswick. In coarse of time the growth was slow but steady for a good many years. This is entirely due to strict outer precautionary measures and to effective isolation. The absolute number of lepers is reduced, and the diminution in ration of the population is still greater.

Mexico

Leprosy has been known in Mexico from very remote times, and still exists in a limited manner in the present day among the poor who dwell in the damp and inhygienic places\textsuperscript{41}. In the North of Mexico where there are cold places where the disease scarcely exists at all, and on the contrary, in the South it is much more common where the temperature is much higher. Therefore, it is believed that the increase of the temperature coupled with the moisture of the atmosphere are favourable conditions for

\textsuperscript{39} Ibid, p. 140.
\textsuperscript{40} Ibid.
\textsuperscript{41} Leprosy in India, Summary reports, Honolulu, 1886, P. 181.
the development of leprosy. The malady has existed in Mexico from a period anterior to the conquest by Fernando Cortes, who established an asylum and hospital known as Juriz Hospital especially for lepers. During course of time, the number of lepers has decreased, because the public necessities are amply met by the hospital treatment.

The second leprosy census in Mexico in 1937-38 has revealed the increase of 540 additional cases to already registered cases of 2357 lepers. “A Society for the protection of lepers” was established to protect the healthy children of leprosy patients in the Federal District.

**Colombia**

Leprosy is one of Colombia’s greatest problems, there being 12,000 estimated cases by 1939. 12 leprosy dispensaries have been established in different parts of the Country and of these four are meant for healthy children of leprosy patients. Results of treatments in the leprosium is encouraging since 64% show improvement and 24% became arrested.

**Brazil**

In Brazil also the leprosy was one of the greatest problems. A revised census revealed 35,000 lepers in June, 1938, distributed as north, 2.05 per 1000; central

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43 Ibid.
44 “Leprosy in South America, Resume of discussions at the Tenth Pan American Sanitary Conference”, Bogota, Colombia Sept. 4-14, 1938, Bulletin de la oficina Sanitaria Pana maricana 18 1939, P. 420-421.
45 Ibid.
Northeast, 0.2; Center, 1.13; and South 0.49. The contagion is spread especially among
the poorer classes. The Federal Government is maintaining 28 leprosias and 22 under
construction by 1939. Dispensaries also have been established in the states of Sao
Paulo and Espirito Santo to combat the leprosy menace\textsuperscript{46}.

\textbf{Argentina}

In Argentina the leprosy is not a big problem except a few who arrived from
Neighbouring countries. The government took effective steps from the beginning to
contain the disease\textsuperscript{47}.

\textbf{Ceylon}

True leprosy is known in Ceylon and has been recognized since the time of
the Dutch occupation of the island\textsuperscript{48}. The earliest record of the disease being connected
with the asylum founded and transferred to the British Government by a Dutch lady
who was herself a leper. It was known to the Singhalese from a remote period as a skin
disease under the name of “Gaja Charma”\textsuperscript{49}.

It is considered a constitutional disease “Sui genesis” and occurs more
frequently on the Western and Southern Sea-Coast of the Island and in Colombo, and
on the banks of rivers and littoral lakes, in low, more or less damp and malarial
localities. The disease is usually seen among the poorer natives, whose dwellings are

\textsuperscript{46} Ibid.
\textsuperscript{47} Ibid.
\textsuperscript{48} Leprosy in India op.cit., p. 161.
\textsuperscript{49} Ibid, p. 162.
usually small, thatched huts, ill-ventilated and crowded, with the immediate neighborhood filthy and strewn with mouldy and rotten vegetation and excremental deposits; their clothing deficient; their diet poor from insufficiency of nitrogenous elements\textsuperscript{50}.

The disease is not considered contagious in Ceylon\textsuperscript{51}, and lepers are not generally shunned by their relatives or friends for fear of infection. There is no restriction imposed or segregation enforced by legislative enactment or otherwise in respect of lepers. They are allowed to mix freely with the people and are frequently met within crowded localities in town as mendicants. They are only brought into the asylum when they become physically disabled.

The asylum consists of twelve wards having accommodation for 159 patients in separate blocks for males and females. Immigration from India of Malabar coolies infected with the disease seems to have been contributed to the increase of leperory in the Island\textsuperscript{52}. Leprosy is very unfrequent in the hilly districts of the Central as it is observed in the other provinces of the Island.

**Burma**

The system of leper colonies that has been established in the Kengtung Shan state of Burma by the American Baptist Mission had its inception in 1929, when in

\textsuperscript{50} Ibid, p. 164.
\textsuperscript{51} Ibid, p. 165.
\textsuperscript{52} Ibid, p. 166.
1930 a total of 23 and in 1934, 80 were established\textsuperscript{53}. Of the annual contributions received the American Mission to Lepers has made the largest, beginning in 1931. A small continuing grant has also been made since that year by the local state. Beginning in 1935 increasing grants have been made by the Commissioner of the Federated Shan states, and since 1936 contributes have also been made by the Burma branch of the British Empire Leprosy Relief Association. The total cases in treatment in Burma by 1938 are 4686 and of these asylums and homes treated 1,557 in leprosy colonies 1,171; jailes, 84 patients treated in clines are 1,874\textsuperscript{54}.

**Guatemala**

In Guatemala, leprosy exists where the climate is hot and very variable. The leprosy mostly exists among the people of the lower class, who live on the cheapest kind of accommodation, food and give no attention to cleanliness. The disease has increased in Central America, because the lepers were not segregated, and members of families known to have leprosy were allowed to marry\textsuperscript{55}.

**Netherlands and Colonies**

Leprosy occurs not only in the Netherlands, but also in the East and West Indian Netherlands possessions. In the East and West Indies leprosy is endemic, but whilst the disease is of Java. At one time when leprosy was held to be infections

\textsuperscript{53} *Leprosy News and Notes*, Resume of Discussions at the Tenth Pan American Sanitary Conference, Bogota, Colombia, Sept. 4-14, 1938 from the Bolitin de lama Officina Sanitaria Panamericana 18, 1939, pp. 420-421.

\textsuperscript{54} Ibid.

\textsuperscript{55} Leprosy Reports op.cit, P.P. 173-175.
persons affected with the disease, both in the Netherlands and the colonies, were isolated either in special institutions or even on certain islands dedicated for that purpose. Leprosy is found equally amongst Europeans, Chinese, Arabs and native Indians, it is more prevalent on the seaboards and also in the mountain ranges.\(^{56}\)

**Norway**

In Norway, the leprosy exists since several centuries.\(^{57}\) It appears amongst the poorer classes, along the sea coast and its immediate neighborhood. When lepers are so poor, that they want public support, they are obliged to seek it in public asylums, and are not supported in their homes or in the parishes as other poor. In the public asylums where all lepers seek admittance are received free. In these asylums marriage of course is prohibited, and the two sexes are kept apart. In 1880, 617 leprosy patients got admittance in public asylums. The disease diminished due to the higher civilization, better sanitary habits, and the dietary practices.

**Siam**

Leprosy prevails very slightly in Siam, more so amongst the Chinese than Siamese population. It has not yet been the subject of special legislation and the Government of Siam did not enforce segregation of lepers, but there exist certain temples where the priests specially devote themselves to attending to paupers and lepers by supplying them with food and allowing them to camp on the premises of the temple. No royal or private hospitals or asylums for lepers exist in Siam. The Siamese as well

\(^{56}\) Ibid, P.P. 186-187.

\(^{57}\) Ibid, P.P. 1920.
as the Chinese assert that the disease is hereditary but not catching, and are therefore not afraid of being near a leper\textsuperscript{58}.

**Spain**

The leprosy is rare in Barcelona and in Spain\textsuperscript{59}. To judge the rarity of this disease only one hospital known as St Lazarus is designed for lepers. The hospital contains two wards exclusively; one for men and the other for women entirely independent, having besides several accessory departments such as refectory, kitchen, dwelling for employees, wardrobes, offices etc. A great number of medicines have been tried to combat this disease, but in almost all cases without result. The patients are allowed to come and go from the Hospital without an opportunity being afforded for the completion treatment.

**Leprosy in Japan**

In Japan, Leprosy is considered as an incurable and highly inheritable disease, so those who have leprosy, or its tendency; among their families or relatives, are strongly refused to marry with other healthy families. In Japan the leprosy is not confounded with any other disease, and hence there is no special hospital supplied by government for lepers, but there is one private leper hospital in Tokyo\textsuperscript{60}. There is no special place to isolate the lepers, as Molokai in this country; but the lepers are confined

\textsuperscript{58} Ibid, P. 194.
\textsuperscript{60} Ibid, p. 211.
to their own homes and are cut off from any social intercourse with others, being strongly refused by all society.

III(e). AUSTRALIA AND ITS SURROUNDING AREAS

In Australia, the leprosy is present among some of the early Indonesian and Chinese arrivals and slowly spread among the aboriginals and distinct cultural and linguistic groups of ‘walkabouts’\textsuperscript{61} among whom there is no contact with each other for decades. In Australia some infected Chinese brought leprosy to the towns in which they settled. This also happened in New Zealand. More recently, Caucasians from East and Central Europe, as well as from the Mediterranean islands, have been responsible for small and limited foci in the large towns. In addition, a few infections have been contracted in Papua New Guinea\textsuperscript{62} among Australians who have worked there for a time.

Movements of populations in South Pacific accounts for changes in the leprosy pattern in countries like New Zealand, where most of the present patients come from the ‘the Islands’ (i.e. Fiji, Cook, Gilbert and Ellis, Samoa, etc) to augment the small and disappearing problem among the indigenous Maoris.

Indonesia

It was estimated that in the beginning of 20\textsuperscript{th} Century there were 100,000 leprosy sufferers in Islands of the Netherlands, East Indies, which after its independence

\textsuperscript{62} Ibid, P.P. 7-8.
in 1950’s came to be known as Indonesia. The Salvation Army was the first missionary organization which established four leprosy colonies in the country\(^63\).

**First Colony**

On 15 January, 1909, at a former health resort high in the mountains of Plantungin, in Central Java, the first Salvation Army, ‘Leper Colony’ was established with staff-captain and Mrs. Schefferhe Dutch and she British as the first managers\(^64\). His arrival with his wife and two children has become a boon to the leprosy sufferers of the area as both wife and husband has shared their needs, burdens, sufferings and sorrows.

Scheffer was assisted by two nurses and a small staff of lay workers in the leprosy home in which 150 to 200 patients were accommodated in their care in neat well built wards in various stages of the scourge. An experienced government doctor in leprosy visited the colony each week where the treatment was Palliative only. Adult patients were engaged in gardening, needle work, fret work, cooking and reading from a small library. Children were sent to the colony school which was taught by a teacher blinded from leprosy. Regardless of race whether they were cooks, teachers, journalists, Senior Civil servants or policemen, all the nationalists were accommodated in the leprosy colony at Pelantungan\(^65\).

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\(^64\) Ibid, P. 40.

\(^65\) Ibid.
The Salvation Army Bard stead at Pelantungan was consisted of leprosy patients only. The bandmaster was blind whose both eyes were destroyed by the savage disease which had also mutilated his face. The first cornet player, though tuneful could hardly balance on the stumps that served for feet and several times at the end of the performance, used to fall back on another bandsman to be carried to his quarters. The drummer kept up a steady entrancing rhythm suitable for the occasion by holding the drum stick between the stumps of the two remaining fingers of the hand\textsuperscript{66}. When the Salvation Army moved into Palantungan, Chaulmoogra oil, taken by mouth or by injection, was the mainstay of leprosy treatment\textsuperscript{67} until such time the sulpha drugs were discovered and used for its cure.

Later, an outstanding officer, Ensign Lien Giok Njo rendered notable services among leprosy patients at Pelantungan. Her father was a Chinese and her mother was a Javanese. After her conversion to Christianity she responded to an appeal by the Salvation Army and did memorable service to the patients although she was an illiterate and could neither read nor write. But she worked hard to make good this handicap, and offered herself for officership. Able to speak five languages fluently she proved invaluable among the multilingual patient community at Pelantungan and many conversions to Christianity were the result of her simple, faithful witness\textsuperscript{68}.

\textbf{Second Colony}

\textsuperscript{66} Ibid.
\textsuperscript{67} Ibid, P. 42.
\textsuperscript{68} Ibid, P. 43.
In 1914, at the request of a local committee of trades people, the Salvation Army accepted the management of a second leprosy colony at Pulausi Tjanang, built on reclaimed Swampland on the east coast of Sumatra. Two Australian Salvationist officers, staff-captain and Mrs. Robert Burney, took charge. The colony was financed by the Government where new wards, dining hall and medicine room were erected. At Pulau Si Tjang Salvation Army cared for as many as 300 patients at a time. In 1926, when the Salvation Army General, Bramwell Booth visited the colony, he found an active Salvation Army corps of Salvationist patients in the colony.

Third Colony

The third leprosy settlement by Salvation Army was established at Kundur in South Sumatra of Indonesia in the year 1917 and again, at the invitation of a local committee. The Salvation Army took over management and appointed major and Mrs. Ulying, of Holland, as the first officers. Eventually this colony provided care or refuge for between 250 and 300 leper patients.

Fourth Colony

Early in 1918 at Semaranga, East Java, the Salvation Army assumed responsibility for a fourth colony. Adjutant and Mrs. Tilbury of Britain were appointed as managers to the colony which accommodated 200 patients. During the Ist World War, when allied naval forces needed this area for their operations all the leper patients were removed to a new site near Malang 150 miles inland. But when Japanese

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69 Ibid, P. 42.
70 Ibid.
71 Ibid.
were over running to the country, the colony was closed and the Salvation Army turned out, forcing the patients to fend for themselves. The colony was never re-opened later.

At all these four centers in Indonesian in which the Salvation Army has rendered invaluable service with fully trained missionary as well as locally trained national nurses gave devoted service to the leprosy patient. But at no time, the Army was able to appoint a Salvationist doctor to oversight the treatment of leprosy patients. The Government medical officers visited the colonies regularly and gave the required medical treatments to the patients including the necessary, surgical attention to ulcers and also performed amputations to the worst limb.

The National Salvation Army officers served faithfully in the leprosy colonies and brought the gospel of love and forgiveness to those people who had little hope in this world. Although many of the patients were Muslims, Hindus and Buddhists, most of them professed conversion and some, at their own request got enrolled as Salvation Army Soldiers\textsuperscript{72}.

**Conclusion**

The spread of leprosy in Countries with in the medico-geographic tropics where it continues to be a problem of Public health importance. In the absence of reliable statistics, it is impossible to do more than guess at the dimensions of the problem at any time. In spite of the considerable efforts of governments and voluntary agencies over recent years and greatly increased knowledge of the disease itself and of the complex bodies defenses against infection, the presence of leprosy in the world as whole shown little sign diminishing. Leprosy indigenous or imported, is present in

\textsuperscript{72} Ibid, P. 42.
practically every country, but it failed to re established itself in western Europe where it
has rife round about thirteenth century. It is not possible to prove variations in the
historic past, however, the waxing and waning of transmission of disease attributable
some times to environmental factors and often to no identifiable change are well
attested.