

THE ENGLISH BIBLE : ITS CONTRIBUTION
TO THE
ART AND SCIENCE OF MEDICINE

by

P. M. Shepherd, O.B.E., M.B., Ch.B. (Glasgow 1924)

1 Magdalen Bark,
Craigie,
Perth.

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C O N T E N T S

<u>SECTION</u>	<u>PAGE</u>
INTRODUCTION -----	3
MEDICINE : GENERAL -----	11
SYSTEMATIC -----	22
SURGERY -----	35
MIDWIFERY -----	47
THE SPECIALTIES -----	60
Ophthalmology -----	61
Ear, Throat and Nose -----	63
Insanity -----	66
Diseases of Children -----	70
Diseases of the Skin -----	74
MEDICAL JURISPRUDENCE -----	77
PUBLIC HEALTH -----	96
MATERIA MEDICA AND THERAPEUTICS -----	115
PATHOLOGY -----	130
ANATOMY -----	140
PHYSIOLOGY -----	149
THE BASIC SCIENCES -----	165
Botany -----	166
Zoology -----	184
Physics -----	207
Chemistry -----	221
POSTSCRIPT -----	234
BIBLIOGRAPHY -----	236
INDEX -----	238

THE STATE

The State is a legal entity which is created by the people of a territory and which is organized to exercise the powers of government within that territory. It is a legal person which can own property, sue and be sued, and enter into contracts. The State is the primary source of law and order within its territory.

I N T R O D U C T I O N

The purpose of this study is to examine the role of the State in the development of a nation. It will discuss the historical evolution of the State and its functions in modern society. The study will also analyze the relationship between the State and the individual citizen, and the impact of the State on the economy and social structure. This is a descriptive study of the State and its functions.

THE ENGLISH BIBLE : ITS CONTRIBUTION
TO THE
ART AND SCIENCE OF MEDICINE

INTRODUCTION

The Bible has not received due appreciation in one domain - that of its references to the Art and Science of Medicine. Naturally, men have not regarded it as a scientific book and it makes no claim to be such, but there is much in it which surprises and rewards the scientific student on a diligent perusal of its pages.

For some reason also the Bible has been dismissed in somewhat cavalier fashion by certain writers of Medical History. In one History of Medicine the author states, "The ancient Jews, like other Semitic peoples, were not pathfinders in medicine...In only one branch, public hygiene, were early Jews pre-eminent; along this line they enjoy the reputation of being creators."

Another medical historian tells how he made a compilation of the medical references in the ancient classics, but adds that the Bible was a disappointment because of the paucity of its medical allusions.

A third writer states, "There are very few biblical references to the facts of anatomy and physiology." One wonders how he missed St. Paul's fairly numerous remarks embracing these very subjects, e.g.,

"The whole body fitly joined together and compacted by that which every joint supplieth, according to effectual working in the measure of every part, maketh increase of the body." Ephesians 4:16.

Or "The head, from which all the body by joints and bands having nourishment ministered and knit together, increaseth." Colossians 2:19.

The companionship of the physician Luke for over twenty years left an indelible impression on St. Paul's receptive mind, as one would expect.

Against the foregoing statements of certain writers may be placed that of a recent author who remarks, "In some respects the knowledge of disease of the Israelites was truly remarkable. Moses and his assistants were good clinicians so far as observation was concerned."

Bible and Primitive Medical Methods contrasted

To one who has first-hand knowledge of the crude, futile and often cruel medical methods prevalent amongst primitive peoples, it comes as a striking contrast that there is no trace of such methods in Bible literature. It would be a simple matter to harrow feelings by narrating the expedients resorted to by practitioners of sorts among Negro and Bantu peoples. One lifts the curtain only a little: The writer has counted 134 knife cuts on the legs of a small girl. Those cuts represented the attempts of a native doctor to banish the gnawing pain in the bones which accompanies syphilitic disease. In South Africa a European doctor went to see a native doctor at work. A young woman came forward complaining of severe headache. The native medico told her to kneel. He

then took a dirty knife and made two cuts cross-wise down to the bone in the forehead. The cure for pain in the head? Nothing simpler - let it out!

Even in nations which can boast a more or less civilised past we find rude treatments. Too often they take the form of filth therapy.

One turns from the throwing of bones, the wearing of charms and amulets, the welter of superstition, the administration of vile concoctions and one is gladdened to find that there are none such in Bible pages; rather the principles enunciated are, in many instances, the principles of modern medical methods in the Western World, and in other instances modern medicine is definitely foreshadowed: anti-sepsis, incineration, quarantine, strict public health measures, the danger of disease finding a suitable nidus for its growth in blood, insect and animal transmission of sicknesses, compensation and redress for injury, the services of ambulance and hospitalisation, the accessories of nursing and defraying of costs, and many other modern principles and practices - all are found in the Book which we have read for other purposes than medical education.

It is significant that we find in the Bible that the sick are enjoined on occasions to wash. It is altogether foreign to the thought of primitive sick peoples to wash their bodies while they are ill. The writer has often had to send patients to bathe before it was possible to attempt a diagnosis of their complaints.

Again, the natives of West and South Africa have a definite rule in midwifery that the umbilical cord is not to be cut till

the after-birth has come away. The child may be left lying on the mud floor of the hut for hours, if there is delay in the extrusion of the placenta. The uncut umbilical cord is mentioned once in the Bible - Book of Ezekiel 16:4 - but there it is mentioned as an emphatic illustration of gross neglect.

Clinical Signs and Symptoms

The clinical descriptions in the Bible in many cases make a modern diagnosis easy. James Collier, formerly Physician to the National Hospital, Queen's Square, London, in writing the chapter on Epilepsy in "A Short History of some Common Diseases" stated -

"Full conversance with the clinical features of epilepsy is shown in many ancient writings, none of which describe epilepsy so completely or in so few words as that in the ninth chapter of St. Mark's Gospel, which, with two additions from St. Matthews and St. Luke's versions of the same story, form so full a summary of events in epilepsy as forbid omission in any history of the subject."

In following descriptions given in Bible pages of diseases, arrival at the diagnosis is at times easier than following the rationale of the treatment employed. It will be admitted that this is in keeping with medical progress generally. Diagnosis is almost invariably in advance of treatment; the latter may be empirical for a long time.

As was to be expected, the signs and symptoms of tropical and sub-tropical diseases are prominent in biblical accounts of ailments; but many of the common conditions of modern times are also encountered. This is in keeping with what is found in tropical and sub-tropical countries to-day. The

doctor who has his practice in such regions is struck by the number of patients who consult him on account of rheumatism, tuberculosis, gastritis and such like afflictions. We have no cases in the Bible which suggest cancer or appendicitis. It is rare to find cases of such maladies among Africans to-day if they have kept to their primitive ways, particularly in regard to food.

The diseases enumerated in Holy Writ cover the various systems of the human body - alimentary, circulatory, skeletal, nervous, renal, glandular and reproductive. There are not the fine distinctions of kindred types which present-day medical science has elaborated, but there are interesting accounts of well-known and lesser-known troubles which arrest the attention of those trained in the medical art.

The Value of the Study

It may be asked what benefit such a study as this can afford? Apart from the fact that ancient literature which has survived the ravages of the centuries has usually done so because of intrinsic merit, the assertion can be made that the respect which the Bible has acquired in many fields will not be lessened by a study of its pages from a medical standpoint, and, in addition, such a study, while found to be intensely interesting, may be of real practical value. To illustrate: Sir William Macewen once asked Colonel Liston, the authority on Plague, to address his class in Glasgow University. Colonel Liston described the early researches in regard to Plague in India, and spoke of almost two years spent before the part

played by the rat and rat flea was discovered. He pointed out how this period of time, and many lives, might have been saved if the indication given in the First Book of Samuel as to the agent of plague transmission had been taken up. Thus it was only at the beginning of the present century that the connection between emerods - buboes - and rodents was realised, and yet that fact is noted far back in the Old Testament record.

That there is a vast continent separating the cultured European from a lowly member of a savage race will be readily admitted. The difference, however, is not greater than that between a witch doctor, with his hideous paraphernalia and agonised victims, and the humane priestly medical of the Old Testament. In Bible accounts there is added to the priestly-medical of the Mosaic dispensation that courtly exponent of the Greek Medical School - the beloved physician Luke. And beyond comparison even with these, there is the superb attitude and perfect manner - bedside manner, if one wishes the term - shown in the story of the raising of the daughter of Jairus, of Him who wherever He went was besieged by the diseased, and of whom we are told that when He went forth He "saw a great multitude, and was moved with compassion toward them, and He healed their sick." Matt. 14:14.

The Course of the Present Study

In the following pages the Bible is largely left to speak for itself. Medical and Biblical study and the experience of a quarter of a century in service as a missionary doctor

among primitive tribes in Africa - first in Calabar and later in Bechuanaland Protectorate - are drawn upon to clarify certain points.

The Sections are listed according to the subjects of the Medical Curriculum, namely, MEDICINE : SURGERY : MIDWIFERY : THE SPECIALTIES - Ophthalmology; Ear, Throat and Nose; Insanity; Diseases of Children; and Skin Diseases : MEDICAL JURISPRUDENCE : PUBLIC HEALTH : MATERIA MEDICA AND THERAPEUTICS : PATHOLOGY : ANATOMY : AND PHYSIOLOGY. In addition, there are chapters on the BASIC SCIENCES - Botany; Zoology; Physics; and Chemistry.

M E D I C I N E

"Jesus went about all the cities and villages, teaching in their synagogues, and preaching the Gospel of the kingdom, and healing every sickness and every disease, among the people."
 Matt. 9:35.

"And there came a leper to him, beseeching him, and kneeling down to him, and saying unto him, If thou wilt, thou canst make me clean. And Jesus, moved with compassion, put forth his hand, and touched him, and saith unto him, I will; be thou clean. And as soon as he had spoken, immediately the leprosy departed from him, and he was cleansed. And he straitly charged him, and forthwith sent him away; And saith unto him, See thou say nothing to any man: but go thy way, show thyself to the priest, and offer for thy cleansing those things which Moses commanded, for a testimony unto them. But he went out, and began to publish it much, and to blaze abroad the matter, insomuch that Jesus could no more openly enter into the city, but was without in desert places: and they came to him from every quarter."
 Mark 1:40-45.

M E D I C I N ESECTION 1GENERALSpecific Diseases : Mostly Infectious or Contagious

It was to be expected that prominence be given in Bible pages to diseases which devastated the country of Palestine and adjoining lands, and which decimated the populations.

One has only to read Pepys' Diary to see how the arrival of Plague in Britain caused panic among the inhabitants of this country. Panic was none the less among the Philistines, who were the hereditary enemies of Israel. It is not surprising that there was alarm among the Philistines when Plague was spreading from city to city in their land. Quite evidently they knew the signs and symptoms and also the vectors of the disease. The Bible narrative - abbreviated - is as follows:

"The hand of the Lord was against the city with a very great destruction; and he smote the men of the city, both small and great, and they had emerods (buboes) in their secret parts... And the men that died not were smitten with the emerods; and the cry of the city went up to heaven... Then said they, 'What shall be the trespass offering?... They (the priests and diviners) answered, Five golden emerods, and five golden mice... Wherefore ye shall make images of your emerods, and images of your mice which mar the land.'" 1st Samuel 5th and 6th chapters.

While the Israelites were in their desert wanderings there were four outbreaks of Plague. See Book of Numbers 11:33; 14:37; 16:46; 25:9. The first may have been contracted from the quails; the fourth could possibly be traced to a breach of the Law in mixing with the Moabites. It has been averred that the destruction of the army of Sennacherib was also due to this cause. 2 Kings 19:35.

Leprosy is often referred to in the Bible. It is apparent that it was much feared, as it still is in countries where it is endemic. While other conditions were included under the term 'leprosy' there can be no doubt about the prevalence of leprosy in Bible times and lands. Segregation in the case of the suspected leper was most rigidly enforced. (See Section on Public Health). That leprosy was considered one of the direst of afflictions is seen in the anxious exclamation of Aaron when he saw signs of the dreaded disease in his sister Miriam -

"Aaron looked upon Miriam, and, behold, she was leprous. And Aaron said unto Moses, Alas! my lord, I beseech thee, lay not the sin upon us... Let her not be as one dead, of whom the flesh is half consumed when he cometh out of his mother's womb."
Numbers 12:10 - 12.

The estimation of the condition is also seen in the bitter words of the supposed Leper Psalm -

"My soul is full of troubles: and my life draweth nigh unto the grave. I am counted with them that go down into the pit: I am as a man that hath no strength. Free among the dead, like the slain that lie in the grave, whom thou rememberest no more: and they are cut off from thy hand. Thou hast laid me in the lowest pit, in darkness, in the deeps... Thou hast put mine acquaintance far from me; thou hast made me an abomination unto them: I am shut up and I cannot come forth." Psalm 88:3-8.

No type of patient seems to have more readily excited the compassion of Jesus than the leper -

"And as he entered into a certain village, there met him ten men that were lepers, which stood afar off: And they lifted up their voices, and said, Jesus, Master, have mercy on us. And when he saw them, he said unto them, Go show yourselves unto

the priests. And it came to pass, that, as they went, they were cleansed. And one of them, when he saw that he was healed, turned back, and with a loud voice glorified God, And fell down on his face at his feet, giving him thanks: and he was a Samaritan. And Jesus answering said, Were there not ten cleansed? but where are the nine? There are not found that returned to give glory to God, save this stranger. And he said unto him, Arise, go thy way: thy faith hath made thee whole."

Luke 17:12-19.

The benefits of cleanliness in dealing with leprosy are clearly indicated in the Levitical Law, and the association of the cure with bathing in the case of Naaman - 2 Kings 5 - is not without significance.

Job's Disease : Yaws or Fromboesia

It has been suggested that Job's affliction was leprosy or elephantiasis, but modern research rather indicates that it was Yaws. This affliction is widely prevalent in many tropical countries; in certain areas few children escape. It was a common experience of the writer while in Calabar to treat scores of such patients every morning for months on end. Job's action in taking a potsherd and scraping the 'sore boils' is of interest in view of the fact that, in areas to which European medicine has not penetrated, the native treatment for this disease is to hold the child down and subject him or her to the excruciating agony of having the sores scraped with a rough stone.

Oriental Sore or Tropical Ulcer

There are a number of references in the Bible to ulcerative conditions. There are those who suggest that Job's disease went on to Oriental Sore or Tropical Ulcer, and they affirm

their contention by the signs and symptoms given in Job's own words -

"Satan... smote Job with sore boils from the sole of his foot unto his crown. And he took him a potsherd to scrape himself withal. Job 2:7 & 8.
 My roarings are poured out like waters. 3:24.
 The arrows of the Almighty are within me..the terrors of God do set themselves in array against me. 6:4.
 Wearisome nights are appointed to me. When I lie down, I say, When shall I arise, and the night be gone? and I am full of tossings to and fro unto the dawning of the day. My flesh is clothed with worms and clods of dust; my skin is broken and become loathsome. (My skin closeth up and breaketh out afresh - R.V.) 7:3 - 5.
 Thou hast filled me with wrinkles, which is a witness against me: and my leanness rising up in me beareth witness to my face. His archers compass me round about: he cleaveth my reins asunder, and doth not spare; he poureth out my gall upon the ground. 16:8 & 13.
 My breath is strange. 19:7. By the great force of my disease is my garment changed (disfigured - R.V.): it bindeth me about as the collar of my coat. My skin is black upon me (falleth from me - R.V.), and my bones are burned with heat." 30:18 & 30.

Boils and Carbuncles

One can hardly excuse the cowardice of King Hezekiah in turning his face to the wall and weeping sorely at the thought of death coming to him. But the depression and the great discomfort which accompany a carbuncle must be admitted. The application of a 'lump of figs' to the carbuncle and the subsequent recovery of the patient is worthy of notice. See 2 Kings 20:1-7. The writer on medical matters in "Hastings Dictionary of the Bible" suggests that Hezekiah's 'boil' may have been the bubo of Plague.

Dysentery - Chronic and Acute

Chronic dysentery has been judged the disease producing the miserable condition of Jehoram as narrated in the 21st

chapter of the Second Book of Chronicles. Evidently prolapus-
ani was present in the later stages of the disease, and one
does not wonder that the curtain is rung down with the state-
ment "he died with sore diseases."

Acute Dysentery afflicted the father of Publius, whom Paul
cured after the shipwreck at Melita (Malta). His condition
is described as that "of a fever and of a bloody flux", but
the Revised Bible states that he lay "sick of a fever and
dysentery." Acts 28:8.

Anterior Poliomyelitis is believed to be represented at least
twice in the New Testament. 1. The man with the withered hand
whom Jesus cured. The first three Evangelists all relate this
cure, but Luke, true to the noting of detail which his profess-
ion engenders, alone states that it was the man's right hand
which was affected. Luke 6 : 6 - 10.

2. The patient lying at the Pool of Bethesda who had the
condition thirty-eight years. John 5 : 2 - 15.

Spinal Meningitis has been read into the description of his
servant's illness, as given by the Centurion of Capernaum: "Lord,
my servant lieth at home sick of the palsy, grievously tormented."
Matt. 8 : 5 - 13.

Tetanus has also been suggested as this patient's sickness.

Small-pox of the confluent type has been cited as covering the
sad condition portrayed in the 38th Psalm - 2 - 11 - with its
final words, "My lovers and friends stand aloof from my sore."
Perhaps this Psalm calls for more than a cryptic quotation of
its ending, for the words leading up to that ending are:

"Thy hand presseth me sore. There is no soundness in my flesh...neither is there any rest in my bones ... My wounds stink and are corrupt...I am troubled; I am bowed down greatly...For my loins are filled with a loathsome disease; and there is no soundness in my flesh. I am feeble and sore broken; I have roared by reason of the disquietness...My heart panteth, my strength faileth me: as for the light of mine eyes, it is also gone from me." Psalm 38 : 2 - 10.

Malarial Fever evidently was responsible for the sickness of Peter's wife's mother, as recorded in the first chapter of the Gospel according to St. Mark, and which fever Jesus so thoroughly cured that the fever left her immediately and she was able to rise at once and minister to her guests.

Thomson in his "Land and the Book" - page 356 - provides evidence for the belief that around Capernaum, where Peter's mother-in-law lived, were marshes which probably were the breeding grounds of the malarial carrying mosquito.

The Psalmist gives a vivid picture of a debilitating condition which might be brought on by malarial fever: "He weakened my strength in the way; he shortened my days. I said, O my God, take me not away in the midst of my days." Psa.102:23&24.

Venereal Diseases. It has been questioned if the writers in biblical times knew of venereal disease, but that they noted a connection between vice and disease is indicated by the words:

"Fools, because of their transgression and because of their iniquities, are afflicted. Their soul abhorreth all manner of meat; and they draw near unto the gates of death."
Psalm 107:17 & 18.

And the words of Zophar in the Book of Job could hardly be stronger or more pointed:

"His (the wicked man's) bones are full of the sin of

his youth, which shall lie down with him in the dust. Though wickedness be sweet in his mouth, though he hide it under his tongue... Yet his meat in his bowels is turned, it is the gall of asps within him."

Job 20:11 - 14.

Solomon also related licentiousness with an ultimate pathological state:

"Remove thy way far from her (the strange woman), and come not nigh unto the door of her house; Lest thou give... thy years unto the cruel... And thou mourn at last, when thy flesh and thy body are consumed."

Proverbs 5:8 - 11.

Snowman in his "Short History of Talmudic Medicine" throws light on the closing words of the lurid description of the enticements of the woman of easy virtue, and what they lead to in the case of "a young man void of understanding", as portrayed in the seventh chapter of the Book of Proverbs. Snowman explains that "in biblical times the liver was symbolised as an erotic organ", hence Solomon adding: "He goeth after her straightway, as an ox goeth to the slaughter, or as a fool to the correction of the stocks; Till a dart strike through his liver." Proverbs 7: 23 & 24.

Gonorrhoea may be read into the Levitical Law where it speaks of uncleanness of issue, with or without breaking down of tissue. It has been postulated that the slaying of all the non-virgins, as narrated in Numbers 31:1-19, was an attempt to root out venereal taint. The prophylaxis of gonorrhoea also receives attention in the Law, and the grounds for divorce in case of a partner having the disease are also discussed. See Issues in Leviticus chapter 15, and Divorce in Deuteronomy chapter 24.

Plagues of Egypt

The Plagues of Egypt form an interesting study.

Four of the ten 'Plagues' were probably definite diseases: the remaining six affected health indirectly.

Plagues directly affecting health

3. Lice or sandflies
4. Flies or mosquitoes
6. Boils and blains
10. Death of firstborn

Plagues indirectly affecting health

1. Blood in rivers
2. Frogs
5. Murrain of beasts
7. Hail
8. Locusts
9. Darkness

Plagues directly affecting health

The third plague, stated to have been lice, is thought by some authorities to have been sandflies. That this sickness is no small matter will be accepted by those who have experienced the intense headache and prostration of sandfly or three day fever. The fourth plague was probably mosquitoes. Perhaps no insect vector has been the cause of so much misery to the human race as the mosquito, carrying, as certain species do, malarial fever, yellow fever and elephantiasis. The sixth plague - boils and blains - may have been an ordinary pustular condition, or it may have been venereal in nature and a condemnation of the lewd practices of the Egyptian priests. The rash of small-pox has also been suggested. The tenth plague - death of the firstborn. Pulmonary Plague, which is invariably fatal, has been noted as the possible cause of this devastation.

Others have seen a connection between plagues nine and ten, since the plague of darkness may well have been a severe form of wind, known as the hamsin. The mortality of the country was greatest at the time of the hamsin, for the temperature was lower than that of the rest of the year. Also this wind carried a fine dust which gave rise to respiratory troubles.

Plagues indirectly affecting health

The first plague - Blood in the River Nile - has been associated with an enormous increase of red crustaceans, which is known to occur regularly. The second plague - Frogs are very common in tropical countries and they are usually very much larger than those known in temperate lands. The fifth plague - Murrain of Beasts - may have been anthrax. The seventh plague - Hail - was probably of devastating onset. One has heard of people and animals battered to death on the South African veld with the violence of large hail stones. The eighth plague - Invasion of locusts - ate up all the vegetation the hail had left, and thus famine conditions in the land were intensified. The ninth plague - darkness - may be partly explained by the notes added previously to plague ten.

Professor D. M. Blair has an interesting note on the sequence of the Plagues of Egypt, a note which may well satisfy the medical reader rather than the theories already expounded in these pages. Therefore I think it only right to add that note:

"It has been pointed out that a certain medical sequence

runs through a number of the plagues. The first was the turning of the water into blood, an organic fluid which in that sub-tropical land quickly became putrescent and stark. Decomposing organic matter is a favourable breeding-ground for many kinds of undesirable life, and there followed hordes of frogs which developed in the putrid waters. The frogs died and were gathered together into decomposing heaps, and the whole land stark. The putrid earth became alive with lice, and these may have been the larval forms of the swarms of flies which followed. Flies, we know, are potent carriers of infection, and may well have been the vehicles concerned in the spread of the septic infections among animals and man in the plagues which next succeeded."

MEDICINE : SYSTEMATIC

Diseases are often tabulated according to the various systems of the human body. We find, as already stated, the diseases enumerated in the Bible cover these various systems - Alimentary, Circulatory, Nervous, Renal, Skeletal, Glandular and Reproductive. We shall consider examples found under these varying heads.

Alimentary Diseases. There are not a great many references to diseases affecting the alimentary system. Dysentery has been mentioned. St. Paul's remark about Timothy's gastric condition is well known, and the prescription Paul gave has proved acceptable to many with a like condition, and popular with others with quite other complaints: "Drink no longer water, but use a little wine for thy stomach's sake and thine often infirmities." 1 Timothy 5:23. It has been hinted, somewhat ingeniously, that Timothy's gastric condition produced a lack of energy, which called forth Paul's exhortations as they are

found in 1st Timothy 4:13 - 16. The African is often accused of laziness when any inertia he shows may be traceable to anaemia from worm infection or malaria, or both.

The writer of the Book of Proverbs warns that vomiting may result from over-indulgence in honey: "Hast thou found honey? eat so much as is sufficient for thee, lest thou be filled therewith, and vomit it." Proverbs 25:16.

Jeremiah has a reference which suggests flatulent distension of the stomach and bowels: "My bowels, my bowels! I am pained very at my heart; my heart maketh a noise in me." Jeremiah 4:19.

References to loss of appetite are contained in the words: "His life abhorreth bread, and his soul dainty meat." Job 33:20. "Their soul abhorreth all manner of meat; and they draw near unto the gates of death." Psalm 107:18.

Famine. In his Lamentations Jeremiah gives a vivid picture of debility following upon famine conditions:

"The tongue of the sucking child cleaveth to the roof of the mouth for thirst: the young children ask bread, and no man breaketh it to them. They that did feed delicately are desolate in the streets: they that were brought up in scarlet embrace dunghills."
Lamentations 4:4 & 5.

"They that be slain with the sword are better than they that be slain with hunger: for these pine away, stricken through for want of the fruits of the earth."
Lamentations 4 : 9.

Alcoholism. Jeremiah spoke in his usual direct manner when he said, "Drink ye, and be drunken, and spue, and fall, and rise no more." Jeremiah 25 : 27.

Isaiah also did not mince matters when he condemned the drunkards of Ephraim, and the priests and the prophets for

their addiction to alcohol:

"They also have erred through wine, and through strong drink are out of the way; the priest and the prophet have erred through strong drink, they are swallowed up of wine, they are out of the way through strong drink; they err in vision, they stumble in judgment. For all tables are full of vomit and filthiness, so that there is no place clean." Isaiah 28:7 & 8.

Isaiah also adds: "A drunken man staggereth in his vomit."
Isaiah 19 : 14.

The writer of the Book of Proverbs gives a fairly full account of the signs of alcoholism, and he also comments on its soporific effect:

"Who hath woe? who hath sorrow? who hath contentions? who hath babbling? who hath wounds without cause? who hath redness of eyes? They that tarry long at the wine; they that go to seek mixed wine. Look not thou upon the wine when it is red, when it giveth his colour in the cup, when it moveth itself aright; At the last it biteth like a serpent, and stingeth like an adder... Yea, thou shalt be as he that lieth down in the midst of the sea, or as he that lieth upon the top of a mast. They have stricken me, shalt thou say, and I was not sick; they have beaten me, and I felt it not: when shall I awake? I will seek it yet again."
Proverbs 23 : 29 - 35.

Circulatory Diseases figure in a number of instances in Bible pages. Nabal, from his habits, can be readily pictured as subject to high blood pressure and brittle arteries, and one is not surprised at his apoplectic seizure after an outburst of passionate anger. He seems to have been comatose for ten days before he died:

"Nabal's heart was merry within him, for he was very drunken; wherefore she (Abigail - his wife) told him nothing, less or more, until the morning light. But it came to pass in the morning, when the wine was gone out of Nabal, and his wife had told him these things, that his heart died within him, and he became

as a stone. And it came to pass about ten days after, that the Lord smote Nabal, that he died."

1 Samuel 25:36-38.

Apoplexy may also explain the death of Ananias and Sapphira. Acts 5 : 5 - 9.

Syncope. An instance of syncope may be seen in the fainting of Jacob when told that his son Joseph was still alive: "And they (Joseph's brothers) told him, saying, Joseph is yet alive, and he is governor over all the land of Egypt. And Jacob's heart fainted, for he believed them not." Genesis 45 : 26.

In like manner may be explained the tragic end of Eli the priest: "It came to pass, when he (the messenger) made mention of the Ark of God, that Eli fell from off the seat backward by the side of the gate, and his neck break, and he died; for he was an old man, and heavy." 1 Samuel 4 : 18. As will be seen in the Section on Midwifery, the dire news of the capture of the Ark caused Eli's daughter-in-law to give birth to her child, whom she called I-cha-bod - "Thy glory has departed" - before she died.

A volume issued some years ago has an interesting paragraph on the cause of the Death of Jesus:

"Some eighty years ago an English medical man, Stroud, in a treatise 'On the Physical Cause of the Death of Jesus,' drew attention to the fact that there is such a thing as heart rupture through intense physical or mental anguish. He contended that on such occasions the heart bursts and the blood contained in it flows into the surrounding sac in which it separates into two substances, one being clotted and of the colour of blood, and the other a pure, colourless substance resembling water. And if the sac thus filled should be pierced by a sharp instrument there would flow out both substances, which, to the ordinary spectator, would appear as blood and water. This theory, which

was supported by eminent medical men, was applied to the death of Jesus to explain the cause of his quick and sudden passing. To the soldiers it came as a surprise to find Jesus dead when, since the early decease of the prisoners was desired in view of the approaching Feast-day, they arrived with the customary mallet to break the victims' legs. Many prisoners remained on the cross alive for days, but Jesus passed away within six hours. Before He died, however, He cried aloud again and again as if His strength were by no means exhausted, but suddenly with a cry He 'yielded up the ghost.' And when the soldier pierced His side with a spear 'forthwith came there out blood and water.'"

"The Humanism of Jesus" - R.H.". Shepherd.

This diagnosis has been questioned by Professor Rendle Short.

One difficulty which the writer of this Thesis finds is in the fact that in ancient paintings of the Crucifixion of Jesus the spear wound, which the Roman soldier made by thrusting his weapon into the side of Jesus, is almost invariably depicted on the right side of Jesus.

Nervous Diseases. The cases of nervous disease in the Bible arrest attention. Neurasthenia might be read into the words: "A trembling heart, and failing of eyes, and sorrow of mind: And thy life shall hang in doubt before thee; and thou shalt fear day and night, and shalt have no assurance of thy life." Deuteronomy 28 : 65 & 66.

Angina pectoris has also been cited as covered by the above description.

Temporary Aphasia took place in the experiences of Ezekiel - Ezekiel 3:26 - and Zecharias - Luke 1:5-23 & 57-66. The condition of Zecharias is almost a 'book picture' of aphasia, though curiously while the Aphasia lasted he seems not to have suffered from agraphia.

The Prophet Zechariah threatens the 'idol' shepherd with hemiplegia: "Woe to the idol (worthless - R.V.) shepherd that leaveth the flock!...His arm shall be clean dried up, and his right eye shall be utterly darkened." Zechariah 11 : 17.

Brachial monoplegia fell upon King Jeroboam when he commanded the arrest of the man who protested against the king's action in offering incense at the false altar: "His hand, which he put forth against him, dried up, so that he could not pull it in again to him." 1 Kings 13:4. Paraplegia has been diagnosed as the affliction of the man who was borne of the four undaunted companions who did not stop at stripping the roof so that Jesus might be reached. Mark 2:3-11. The added word of Jesus to this man, "Thy sins be forgiven thee" might be construed to imply guilt, and this brings to mind the disease locomotor ataxia. Also the question is prompted, Is there a connection between the biblical phrase "visiting the iniquities of the fathers upon the children" and the fact that of the dire physical scourges of the world, e.g., cancer, leprosy, malaria, yaws, sleeping sickness, tuberculosis, syphilis, only in the last - which is generally contracted by moral default - is the disease found, with its germs visible in the tissues of the newly born child?

Paraplegia from myelitis has been given as the sickness of Eneas whom Peter found had kept his bed for eight years. Acts 9:33.

Trance or Catalepsy. There are a number of descriptions of a state of trance in Bible pages. Paul, in words which have been much commented on and from which many deductions have been made

tells of his visions "whether in the body, or out of the body, I cannot tell: God knoweth." 2 Cor. 12:1-6. In the case of the Apostle Peter the word 'trance' is employed twice over: "I was in the city of Joppa praying: and in a trance I saw a vision." Acts 11:5 also Acts 10:10.

In the Book of Numbers we are told of Balaam "The man whose eyes are open hath said: He hath said, which heard the words of God, which saw the vision of the Almighty, falling into a trance, but having his eyes open." Numbers 24 : 3 & 4.

Temporary Amaurosis is noted in the section on Ophthalmology. Other nervous conditions are dealt within the section on Insanity.

Sunstroke. There can be little doubt that the Shunammite's boy found the sun too strong for him when he followed his father's reapers in the harvest field, and which caused him to cry "My head, my head!" 2 Kings 4 : 19. It should be added that fulminating cerebro-spinal meningitis has also been given as the diagnosis of this boy's condition.

Malingering. Sir John Collie, in an admirable essay on this subject, has observed: "Malingering is as old as Jacob and Jacob flourished 2000 B.C. Jacob's favourite wife, Rachel, malingered when she tried to secrete the idols which she stole from her father Laban." The exact words of Scripture are: "Now Rachel had taken the images, and put them in the camel's furniture (saddle - Moffat's Translation), and sat upon them. And Laban searched all the tent, but found them not. And she said to her father, Let it not displease my lord that I cannot

rise up before thee; for the custom of women is upon me. And he searched, but found not the images." Genesis 31:34 & 35.

Renal Disease. A reference in the seventh verse of the sixteenth Psalm to the reins instructing in the night season has been held to bear out the condition of disturbed rest which frequently accompanies kidney trouble.

Skeletal Diseases. The Bible references to diseases involving the bones are mostly in regard to conditions which debarred a man from entering the priesthood, even though he was of the House or Tribe of Levi, from which tribe the priests were recruited. Such conditions were described as 'flat nose' (saddle nose or cleft palate), 'broken footed' (talipes or club foot), 'broken handed' (droop wrist), and 'Crookback'. See Leviticus chapter 21.

We are also told of the disease which appeared in the feet of Mephibosheth, which was a sequel to his nurse letting him fall. 2 Samuel 4 : 4.

Jesus cured a woman of kyphosis who "was bowed together, and could in no wise lift herself up." Luke 13 : 11. These skeletal conditions belong more to the Sections of Surgery and Pathology, in which they will again be dealt with.

Glandular Disease. How far pituitary disturbance was responsible for the gigantism of Og King of Bashan, whose bed was nine cubits in length - $13\frac{1}{2}$ feet - and four cubits in breadth - 6 feet - is a question open to debate. Goliath also might be brought into the discussion. Deut. 3:11 & 1 Sam.17:38-51.

Senility. The Bible's picture of old age, as given in the last chapter of the Book of Ecclesiastes, is unsurpassed, if at all equalled, in the whole of the world's literature. This extract deserves to be better known and understood than it seems to be in our day:

The keepers of the house tremble	= trembling arms of age
The strong men bow themselves	= legs feeble
Grinders cease because few	= teeth gone
Darkened windows	= failing sight
Doors shut in the streets when sound of grinding is low	= fallen-in mouth
Rise at the voice of the bird	= Sleeplessness
Daughters of music brought low	= vocal chords affected
Afraid of that which is high	= breathlessness
Fears shall be in the way	= timidity
Almond tree shall flourish	= white or grey head
Grasshopper a burden	= irritability
Silver cord loosed	= spinal cord lacks tone
Golden bowl broken	= brain impaired
Pitcher broken at fountain	= heart failing
Wheel broken at cistern	= prostatic enlargement
	Ecclesiastes 12 : 3 - 6.

Another vivid portrayal of senility or old age is seen in poor old Barzillai, who was conscious of going down the other side of life's hill rapidly, when he replied to King David's kind invitation to come and stay with him as a guest:

"I am this day four score years old: and can I

discern between good and evil? can thy servant taste what I eat or what I drink? can I hear any more the voice of singing men and singing women? wherefore then should thy servant be yet a burden unto my lord the king? ...Let thy servant, I pray thee, turn back again, that I may die in mine own city, and be buried by the grave of my father and of my mother." 2 Samuel 19 : 33 - 37.

Poisons. It is not surprising to hear that the Israelites encountered snakes in their desert travels, as, for example, in Numbers 21:6. And it is true to type to read, as in Paul's case, of a snake being encountered when he gathered a bundle of sticks. That it must have been a deadly species is evident from the expectancy of the spectators that Paul would swell rapidly and die quickly. People in countries where snakes are common generally have a good knowledge of the various kinds and of the poisonous and non-poisonous types:

"When Paul had gathered a bundle of sticks, and laid them on the fire, there came a viper out of the heat, and fastened on his hand. And when the barbarians saw the venomous beast hang on his hand, they said among themselves, No doubt this man is a murderer, whom, though he hath escaped the sea, yet vengeance suffereth not to live. And he shook off the beast into the fire, and felt no harm. Howbeit they looked when he should have swollen, or fallen down suddenly: but after they had looked a great while, and saw no harm come to him, they changed their minds, and said that he was a god." Acts 28 : 3 - 6.

A vivid story of poisoning and recovery by the application of an antidote is given in the Section of Materia Medica and Therapeutics. Also there we note Christ's promise to His disciples: "They shall take up serpents; and if they drink any deadly thing, it shall not hurt them." Mark 16 : 18.

Types of Patients cured by Jesus

The Bible records that Jesus cured 'divers diseases'. There is indeed variety in the types of patients He dealt with, and this variety the Gospels reveal without further comment. Examples of the range of His cures are found in

Lameness	Matt. 15:31
Senile kyphosis	Luke 13:11-13
Laceration of ear	Luke 22:50 & 51
Fever	Matt. 8:14 & 15
Leprosy	Matt. 8: 2 & 3
Anterior poliomyelitis	John 5: 2-14
Spinal meningitis	Matt. 8: 5-13
Epilepsy	Mark 9:17-27
Paraplegia	Matt. 9: 2-7
Mania	Luke 8:26-36
Deafness & impediment in speech	Mark 7:31-37
Blindness	Matt. 9:27-31
Drop sy	Luke 14: 2-4
Metrorrhagia	Luke 8:43-48
Raising of Dead - Three cases	Mark 5:35-43 Luke 7:11-15 John 11:1-44

The above are only examples of the types of patients which Jesus cured. Many of the cures mentioned are repeated in the four Gospel narratives and many instances given of the same afflictions which yielded to Christ's healing touch. In this connection the comments of a recent writer are to be noted:

"The amazing character of Jesus' miraculous work should not blind us to the fact that He performed no miracle when one was unneeded, and that He was content to use where practicable the ordinary means of relief known to His time. When He demanded of the demoniac 'What is thy name?' it may well be that He was simply following the common practice of pronouncing a maniac's name to produce a lucid interval, a practice no doubt known to His contemporaries, and which is followed still. Again, when He made clay and anointed the eyes of the blind, He may simply have observed a custom of His time for protecting from the glare of the sun eyes that had lately recovered the power of seeing: in His day cataract was sometimes removed by a thorn and the eyes immediately anointed with a mixture of clay. It is noteworthy also that in the Parable of the Good Samaritan - an utterance of incalculable influence in the establishment of hospitals - modern antiseptic methods are largely anticipated: Jesus says that the Samaritan poured oil and wine into the wounds he dressed."

Patients with undiagnosed diseases

In the following cases sickness is referred to but unspecified, and there seem no clues by which one might be led to venture diagnoses. It may be that in time modern excavators will unearth evidence, as they have done in other fields of research, which will throw light on the conditions now veiled. For example, recently it has been pointed out that Epaphroditus, in his journey to Rome to visit Paul, had to go through a region where malarial fever was prevalent:

Abijah	-	1 Kings 14:1	Berhadad	-	2 Kings 8:7
Elisha	-	2 Kings 13:14	Joash	-	2 Chron. 24:25
Lazarus	-	John 11:1	Dorcas	-	Acts 9:37
Epaphroditus	-	Phil. 2:27	Trophimus	-	2 Tim. 4:20

See also section on Diseases of Children for other cases of unspecified disease.

St. Luke's Contribution to Medical Knowledge

In attempting to write a Thesis on The Bible's Contribution to the Art and Science of Medicine, Professor D.M. Blair's drawing attention to St. Luke's writings - particularly as they are brought out in Hobart's monumental work "The Medical Language of St. Luke"- calls for admission. Prof. Blair wrote:

"The full flavour of medical authorship can only be savoured in the original, but even in our Authorised Version characteristic points emerge. There is the vivid precision of detail, little points which do not matter except to the trained medical observer - the age of the patient; the duration of the disease; whether it was congenital; which side was affected, right or left; the specific acts of healing; the immediateness of the cure - alone of all the Evangelists, Luke stresses this point, striking to the medical eye accustomed to observe the slow progress of disease towards recovery or death. In recording miraculous cures, Luke uses a technical word denoting complete restoration to health, while the other Gospels employ a term of common usage, which, however, in the mouth of a physician would have a restricted significance of getting over the attack, possibly with permanent after effects.

It may be well to explain why such special regard can be paid to a physician of nearly two thousand years ago. Had Luke lived nearly one thousand years ago, it would be a very different thing: no weight could have been put on the medical testimony of a physician of those times which were the Dark Ages in medicine as in much else. But Luke was a product of the Greek medical school that flourished from the time of Hippocrates in the fourth century before Christ to the days of Galen in the second century of the Christian era, and is recognised as having been imbued with a true scientific spirit. Diagnosis, in this school, meant logical deduction from careful observation; the doctor was trained to write careful case-histories of his patients - a modern diagnosis can often be made from the Hippocratic case reports which have come to us. Treatment was simple, and on quite modern hygienic lines: clean water, fresh air and sunshine, were important."

St. Luke was the worthy representative of a worthy School.

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S U R G E R Y

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"The Lord God caused a deep sleep to fall upon Adam, and he slept: and he took one of his ribs, and closed up the flesh instead thereof." Genesis 2:21.

"Jesus answering said, A certain man went down from Jerusalem to Jericho, and fell among thieves, which stripped him of his raiment, and wounded him, and departed, leaving him half dead...A certain Samaritan, as he journeyed, came where he was: and when he saw him, he had compassion on him, and went to him, and bound up his wounds, pouring in oil and wine, and set him on his own beast, and brought him to an inn, and took care of him. And on the morrow, when he departed, he took out two pence, and gave them to the host, and said unto him, take care of him: and whatsoever thou spendest more, when I come again, I will repay thee."

Luke 10 : 30 - 35.

"Son of man, I have broken the arm of Pharaoh king of Egypt; and, lo, it shall not be bound up to be healed, to put a roller to bind it, to make it strong to hold the sword...I am against Pharaoh king of Egypt, and will break his arms, the strong, and that which was broken; and I will cause the sword to fall out of his hand...and he shall groan,...with the groanings of a deadly wounded man."

Ezekiel 30 : 21 - 24.

S U R G E R Y

The surgical references in the Bible are more diagnostic than operative in character.

It is a striking fact that we have the germ of the idea of surgery under anaesthesia in the second chapter of the Book of Genesis. The early surgical procedure there recorded recalls the modern operation "sub-periosteal resection of a rib." The statement "and closed up the flesh instead thereof" might be held to justify the conclusion that there was suturing.

Sir James Y. Simpson quoted the words of Genesis 2 : 21 - See Foreword to this Section - to justify the use of chloroform to alleviate the pains of childbirth when he found himself denounced from certain pulpits for aiding and abetting women in an attempt to evade the judgment "In sorrow thou shalt bring forth children." Genesis 3 : 16.

In contrast to the Hebrew acceptance of this statement regarding a 'deep sleep' the reaction of primitive people in the African Bush to anaesthesia is of interest. At first the assurance that a European doctor will put a man to sleep and perform the operation that is required, while the patient feels nothing, is received with scepticism. Even when a patient bears witness after an operation that he felt no pain from the knife, the ordinary native mind cannot conceive a sleeping man not waking when the sharp edge of a knife is applied to him. Such primitive people rather incline to the

idea that the white doctor has the power to kill a man, then operate on him, and bring him back to life when the surgery is done!

Wounds. As we know, apart from the discovery of anaesthetics the epoch-making events in modern surgery were the advents of anti-septic and aseptic methods. Anti-sepsis is anticipated in the statement that the Good Samaritan poured oil and wine into the wounds of the victim of assault. In the Master's unsurpassable story we have also the accessories of ambulance - "set him on his own beast"; hospitalisation - "brought him to an inn"; nursing - "take care of him"; defraying of costs - "he took out two pence and gave them to the host, and said ...whatsoever thou spendest more, when I come again, I will repay thee." Luke 10 : 30 - 35.

H. V. Morton in his book "In the Steps of the Master", telling of his journey down the Jerusalem to Jericho Road says:

"On the crest of the ridge stood the Inn of the Good Samaritan...The building is the usual Turkish khan ...The foundations of the khan, and the ancient rock cisterns below in which water is stored, prove that an inn has been on this site from Roman times and possibly even earlier. There can be no doubt that this is the inn our Lord was thinking of when He told the Parable of the Good Samaritan, because there has never been any other inn between Jerusalem and Jericho." (page 92).

Healing of Wounds. Sir William Macewen always emphasised to his class of students that a healing wound is purple in colour. One wonders if his meaning can be read into the words of the writer of the Book of Proverbs: "The blueness

of a wound cleanseth away evil." Proverbs 20 : 30.

Among primitive peoples we do not find a readiness to wash wounds. Probably because of the fear of fatal haemorrhage the common practice is to apply styptics, usually in the form of dirty, though often effective, concoctions. We read, however, when Paul and Silas were flogged and cast into prison, the jailor "washed their stripes." Acts 16:33.

In Old Testament times there must have been those who were more or less expert in treating wounds, for we read: "King Joram went back to be healed in Jezreel of the wounds which the Syrians had given him at Ramah, when he fought against Hazeal king of Syria." 2 Kings 8 : 29.

Reference has already been made to the wound Peter inflicted by drawing his sword and cutting off the ear of the servant of the high priest. The healing of the ear of Malchus is the only instance among our Lord's miracles of the restoration of an amputated part.

Fractures and other Injuries

Abimelech's temerity in besieging the Tower of Thebez earned for him a fracture of the skull. He was no coward. It is evident from the description that he had no cerebral compression, otherwise Abimelech would not have shown such clarity of speech, nor been able to command his own death with such quick and determined purpose:

"A certain woman cast a piece of a millstone (upper millstone - R.V.) upon Abimelech's head, and all to break his skull. Then he called hastily unto the young man his armourbearer, and said unto him, Draw

thy sword, and slay me, that men say not of me, A woman slew him. And his young man thrust him through, and he died."

Goliath and Sisera also suffered from fractures of the skull, but in their cases death resulted from these fractures:

"And it came to pass, when the Philistine arose, and came and drew nigh to meet David, that David hasted, and ran toward the army to meet the Philistine. And David put his hand in his bag, and took thence a stone, and slang it, and smote the Philistine in his forehead, that the stone sunk into his forehead; and he fell upon his face to the earth."

1 Samuel 17:48 & 49.

"Then Jael, Heber's wife, took a nail of the tent (tent-pin - R.V.), and took an hammer in her hand, and went softly unto him (Sisera), and smote the nail into his temples, and fastened it into the ground; for he was fast asleep and weary; so that he died (so he swooned and died - R.V.) Judges 4:21.

The above three cases are well worth reading in full for their human details.

Paul evidently suffered from concussion as a result of the mauling he received at Lystra: "And there came thither certain Jews from Antioch and Iconium, who persuaded the people, and, having stoned Paul, drew him out of the city, supposing he had been dead. Howbeit, as the disciples stood round about him, he rose up, and came into the city: and the next day departed with Barnabas to Derbe." Acts 14:19&20.

Falls from Windows.

Scripture tells of two men who fell from windows. In the first instance death resulted. Ahaziah "fell down through a lattice in his upper chamber that is in Samaria." 2 Kings 1:2.

Eutychus was more fortunate in the results of his fall:

"And upon the first day of the week, when the disciples came together to break bread, Paul preached unto them, ready to depart on the morrow; and continued his speech until midnight. And there were many lights in the upper chamber, where they were gathered together. And there sat in a window a certain young man named Eutychus, being fallen into a deep sleep: and as Paul was long preaching, he sunk down with sleep, and fell down from the third loft, and was taken up dead. And Paul went down, and fell on him, and embracing him said, Trouble not yourselves; for his life is in him. When therefore he was come up again, and had broken bread, and eaten, and talked a long while, even till break of day, so he departed. And they brought the young man alive, and were not a little comforted."
Acts 20: 7 - 12.

Professor D. M. Blair commented on the above incident most appositely when he wrote:

"Being fallen into a deep sleep...he sunk down with sleep - the double statement, in which Luke makes use of a characteristic Greek medical term for falling asleep, used nowhere else in the New Testament, expresses the deepening unconsciousness which resulted finally in complete muscular relaxation so that Eutychus collapsed out of the window. But why the apparently irrelevant mention of the 'many lights'? It is not irrelevant, but simply the trained medical recorder giving the etiology of what he is about to describe. The lights were oil lamps, smelly and smoky, and one can well imagine the polluted atmosphere of that crowded chamber as the night wore on. The overheated air would pass out of the open window in a constant stream, and the poisonous fumes in time brought Eutychus to a state of coma...Just this little point of the 'many lights' - the swift technical indication that ordinary sleep had passed into helpless stupor - the falling down of the flaccid body - what an unmistakable stamp of truth the story bears!"

Mention has already been made of Eli's death from fracture of the cervical part of the spinal column following syncope; also the case of Mephibosheth, the bones of whose feet were injured by his nurse letting him fall. See pages 25 and 29. Shock from fracture. Since victims of crucifixion were known, in certain cases, to live for days upon the cross, the Roman

soldiers at times found it desirable to hasten death by adding further shock from fracture of the legs, and so end their vigil. Christ's companions in death suffered in this way. John 19 : 31 - 34.

Fracture, shock, death - form a sequence of events to be feared, especially in countries where patients with fractures are brought to hospital on springless waggons over the roughest of tracks. One was specially apprehensive when it was noted that the patient was elderly. Aviation as a rapid and comfortable means of transport is proving a boon in such cases.

Bandaging. The bandage, known as a roller, so common in our surgical work arrestingly appears, albeit figuratively, in connection with a fractured arm in the Book of Ezekiel, as quoted in the Foreword to this Section of Surgery.

Abdominal Injuries. One cannot fail to be interested when coming upon the statement relative to the function of the omentum as the 'policeman of the abdomen' as it is found in the Book of Judges. A surgeon of eminence has pointed out that in the case of Eglon, king of Moab, the omentum gathered itself round the thrust-in dagger: "Ehud came unto him (Eglon); and he was sitting in a summer parlour, which he had for himself alone. And Ehud said, I have a message from God unto thee. And he arose out of his seat. And Ehud put forth his left hand, and took a dagger from his right thigh, and thrust it into his belly: And the haft also went in after the blade: and the fat closed upon the blade, so that he could not draw

the dagger out of his belly: and the dirt came out."
Judges 3 : 20 - 22.

Perforation of the Bowel

It has been suggested by one authority that this condition, which calls for immediate surgical attention, was probably responsible for the death of King Herod - his alimentary tract being perforated by worms. Acts 12 : 20 - 23. It has been a matter of surprise to the writer of this Thesis that there are not more deaths in tropical and sub-tropical lands from perforation - and also from obstruction - by worms.

Circumcision. The commonest form of operative surgery in the the Bible was circumcision. Many primitive peoples employ this rite, and from excavations there have been many proofs that a sharp or sharpened stone was the instrument employed in early days. This throws light on the use of a stone (flint - R.V.) by Zipporah, the wife of Moses. Her strong language to her husband was an emphatic reminder to him of his duty as a Hebrew in the matter of the circumcision of his offspring: "Then Zipporah took a sharp stone, and cut off the foreskin of her son, and cast it at his feet, and said, Surely a bloody husband art thou to me...because of the circumcision." Exodus 4 : 24 - 26.

To be uncircumcised, or to be associated with one uncircumcised was a reproach to the Jew, e.g., "The sons of Jacob answered Shechem and Hamor..." "We cannot do this thing, to give our sister to one that is uncircumcised; for that is a reproach unto us." Genesis 34:14.

To-day, in countries where circumcision is performed not only on males but also on females, women perform the operation on their own sex. The description of the operation of circumcision being performed in a wholesale manner as stated in Genesis 17:23 and 34:24 has its equivalent in present times when scores of youths of certain African tribes are collected into 'circumcision camps' to have the operation done upon them all as part of the 'initiation rites' - which means initiation into the full privileges of manhood. The medical examination of men who have been circumcised in this way made one note that, from the surgical point of view, the operation had been thoroughly done. The operators must have been expert at the manipulative part of their job, though the want of anaesthesia, anti-sepsis and asepsis must have been handicaps. Castration in eastern courts was employed for various reasons to prevent a number of males from reaching normal manhood. That the operation was in vogue in Christ's day is proved by His statement, "There are some eunuchs, which were made eunuchs of men." Matt. 19:12. The Ethiopian whom Philip met and instructed was a eunuch who had prestige in a court circle. Acts 8:26 - 29.

Various Surgical Conditions

Dislocation or Sprain. A multiplicity of explanations has been given for the condition which came upon Jacob as he approached Penuel. One such explanation is found in the diagnosis of sprain in two of the important muscles of the thigh - the psoas and adductor longus. The well-known condition in modern times of displaced intervertebral disc,

pressing on the sciatic nerve, has been put forward as a possible reason for Jacob's lameness. Perhaps the statement of the Revised Version of the Bible leaves as clear a picture as can be obtained: "And Jacob was left alone; and there wrestled a man with him until the breaking of the day. And when he saw that he prevailed not against him, he touched the hollow of his thigh; and the hollow of Jacob's thigh was strained as he wrestled with him....Therefore the children of Israel eat not of the sinew of the hip which is upon the hollow of the thigh, unto this day: because he touched the hollow of Jacob's thigh in the sinew of the hip."

Genesis 32: 23 - 32.

Varicose Ulcers. Sir A. MacAlister expressed the view that we have a case of varicose ulcers in the picture of "A certain beggar named Lazarus, which was laid at his (the rich man Dives) gate, full of sores...moreover the dogs came and licked his sores." Luke 16:20 & 21. Hobart, in his excellent work, "The Medical Language of St. Luke", already referred to, has an interesting note which runs: "There is one particular mentioned...which comes aptly from a physician - that the dogs licked the sores of Lazarus. It is thus put by St. Cyril - 'The only attention, and, so to speak, medical dressing, which the sores received was from dogs who came and licked them.' "

Amputations. It would be interesting to know what the surgical results were like after the amputation of the thumbs and great toes of the seventy kings - 'chiefs'

probably - who were subjected to this disfigurement by Adoni-bezek. The perpetrator of those mutilations admitted the rough justice when the same punishment was meted out to him in turn: "Adoni-bezek fled: and they pursued after him, and caught him, and cut off his thumbs and his great toes. And Adoni-bezek said, Threescore and ten kings, having their thumbs and their great toes cut off, gathered their meat under my table; as I have done, so God requited me. And they brought him to Jerusalem, and there he died." Judges 1 : 6 & 7.

When one reads that punishment for indecency on the part of a woman was, "Then thou shalt cut off her hand, thine eye shall not pity her" - Deuter. 25:11 & 12 - one wonders where the line of operation was marked out.

Senile Kyphosis is illustrated by the "woman...bowed together, and could in no wise lift herself up." Luke 13:11-13. The cure by Christ created a sensation. It is not surprising that in connection with other surgical cures we read: "The multitude wondered, when they saw...the maimed to be whole, the lame to walk." Matthew 15:31.

Boring hole in ear. A very minor surgical operation, including the mention of the name of a surgical instrument - the awl or aul - is found in the boring of a servant's ear who declined to take his liberty in the year of jubilee, but preferred to become a perpetual servant. One notes that a doorpost, instead of a table, steadied the head or ear while the awl was applied. Exod. 21:2&6; Deut.15:16&17.

M I D W I F E R Y

"Lo, children are an heritage of the Lord: and the fruit of the womb is his reward. As arrows are in the hand of a mighty man; so are children of the youth. Happy is the man that hath his quiver full of them: they shall not be ashamed, but they shall speak with the enemies in the gate."

Psalm 127:3 - 5.

"A woman when she is in travail hath sorrow, because her hour is come; but as soon as she is delivered of the child, she remembereth no more the anguish, for the joy that a man is born into the world." John 16:21.

"And there was a certain man of Zorah, of the family of the Danites, whose name was Manah; and his wife was barren, and bare not. And the angel of the Lord appeared unto the woman, and said unto her, Behold now, thou art barren, and bearest not: but thou shalt conceive, and bear a son. Now therefore beware, I pray thee, and drink not wine nor strong drink, and eat not any unclean thing: For, lo, thou shalt conceive, and bear a son; and no razor shall come on his head: for the child shall be a Nazarite unto God from the womb." Judges 13:2-5.

M I D W I F E R Y

Like the majority of oriental and primitive peoples the Hebrews had simple concepts regarding the processes of reproduction and the maintenance of the race.

Sterility was dreaded by the Jewish woman, as it is dreaded to-day by women in the lands of primitive peoples. Rachel's appeal to Jacob, "Give me children, or else I die" - Genesis 30:1 - is understood when it is declared that "Children are an heritage of the Lord: and the fruit of the womb is his reward." Psalm 127:3. It is also appreciated when Elizabeth is declared candidly to have rejoiced because God had looked on her to take away her reproach among men. Luke 1:25. What that reproach means amongst a primitive race only they who bear it know. In the eyes of an African it is unthinkable to kill a cow which is still capable of bearing a calf. A man's wealth lies in his cattle and his children. Oxen are for labour; cows to increase the herd. So an African husband, in bitter disappointment at finding his wife sterile, may taunt her with the words, "Go to the field and plough; you, too, are only an ox!"

In the foregoing ideas we find the explanation of Hagar's insolent conduct to her master's childless wife - even though that wife was the 'first' or 'great wife'. "When she (Hagar) saw that she had conceived, her mistress was despised in her eyes." Genesis 16:4. In this attitude

to life we also find the reason of Elkanah's difficulties in his polygamous household. "Her adversary (rival - R.V.) - Elkanah's second wife Peninnah - also provoked her (Hannah) sore, to make her fret, because the Lord had shut up her womb." 1 Samuel 1 : 6. Perhaps such a situation cannot be described better than in the words of Scripture itself:

"Then said Elkanah her husband to her, Hannah, why weepest thou? and why eatest thou not? and why is thy heart grieved? am not I better to thee than ten sons? So Hannah rose up after they had eaten in Shiloh, and after they had drunk. Now Eli the priest sat upon a seat by a post of the temple of the Lord. And she was in bitterness of soul, and prayed unto the Lord, and wept sore. And she vowed a vow, and said, O Lord of hosts, if thou wilt indeed look on the affliction of thine handmaid, and remember me, and not forget thine handmaid, but wilt give unto thine handmaid a man-child, then I will give him unto the Lord all the days of his life, and there shall no razor come upon his head. And it came to pass, as she continued praying before the Lord, that Eli marked her mouth. Now Hannah she spake in her heart; only her lips moved, but her voice was not heard; therefore Eli thought she had been drunken. And Eli said unto her, How long wilt thou be drunken? put away thy wine from thee. And Hannah answered and said, No, my lord; I am a woman of sorrowful spirit: I have drunk neither wine nor strong drink, but have poured out my soul before the Lord. Count not thine handmaid for a daughter of Belial: for out of the abundance of my complaint and grief have I spoken hitherto. The Eli answered and said, Go in peace: and the God of Israel grant thee thy petition that thou hast asked of him. And she said, Let thine handmaid find grace in thy sight. So the woman went her way, and did eat, and her countenance was no more sad." 1 Samuel 1:8 - 18.

Sarah, the wife of Abraham; Samson's mother; Hannah; the 'great woman of Shunem; the mother of John Baptist - all seem to have been primipara and unipara late in life. Miscarrying wombs and dry breasts were also viewed with special abhorrence: "Give them, O Lord: what wilt thou give?"

give them a miscarrying womb and dry breasts." Hosea 9:14.

Yet one recoils at the bitter complaints of Job and Jeremiah about their births:

"After this opened Job his mouth, and cursed his day. And Job spake, and said, Let the day perish wherein I was born, and the night in which it was said, There is a man child conceived... Because it shut not up the doors of my mother's womb, nor hid sorrow from mine eyes. Why died I not from the womb? why did I not give up the ghost when I came out of the belly? why did the knees prevent me? or why the breasts that I should suck?... as an untimely birth I had not been, as infants which never saw light." Job 3:1 - 17.

One thinks of Dean Swift retiring to his room every birthday, after he was in the grip of Meniere's disease, retiring to read the third chapter of Job with bitterness, applying it to his own lot.

Jeremiah is not one whit behind Job in declaiming against his having been born:

"Cursed be the day wherein I was born: let not the day wherein my mother bare me be blessed. Cursed be the man who brought tidings to my father, saying, a man-child is born unto thee, making him very glad. And let that man be as the cities which the Lord overthrew, and repented not: and let him hear the cry in the morning, and the shouting at noon-tide; Because he slew me not from the womb; or that my mother might have been my grave, and her womb be always great with me. Wherefore came I forth out of the womb to see labour and sorrow, and that my days should be consumed with shame."

Jeremiah 20:14 - 18.

Ante-natal Care. In the Foreword to this Section we see that the advice to Samson's mother - Manah's wife - took very much the same form as given to-day in regard to abstinence from alcohol while pregnant. Her child was to be a Nazarite from birth. John the Baptist was to be an abstainer

from the time he was born, for his father was told: "Fear not, Zacharias: for thy prayer is heard; and thy wife Elizabeth shall bear thee a son, and thou shalt call his name John...He shall be great in the sight of the Lord, and shall drink neither wine nor strong drink; and shall be filled with the Holy Ghost, even from his mother's womb." Luke 1:13-15.

Fertility of the Jews. It is contended by some modern writers that the greater fertility of the Jews even to this day is contributed to by the strict adherence to the Mosaic Laws regarding the period a woman is set apart for 'uncleanness'. See Section on Public Health and Leviticus 12:1-5.

Foetal Movements. Movements in the womb were recognised subjectively and spoken of by Rebekah, the wife of Isaac, when, "The children struggled together within her; and she said, If it be so, why am I thus? Genesis 25:22. And Elizabeth, the mother of John the Baptist, spoke to Mary, the mother of Jesus, of foetal movements within her. Luke 1:44.

For Embryology see Section on Anatomy.

Childbirth

In regard to Christ's remark that Solomon in all his glory was not arrayed like the lilies of the field, Thomas Carlyle noted that such an observation was a look into the deepest deep. Surely in like category were the Master's words about a woman remembering no more the anguish of childbirth once the child was born. See quotation in Foreword of this Section.

The Maternity Cases given in the Bible are arresting, and, in addition to normal births, the number of abnormal ones is relatively high and varied. Altogether, knowledge in the art of aids in childbirth seems to have been much in advance of what we find amongst primitive peoples to-day.

Premature Labour is exemplified by the case of the daughter-in-law of Eli the priest giving birth as a result of the shock of evil tidings:

"And his daughter-in-law, Phinehas' wife, was with child, near to be delivered: and when she heard the tidings that the ark of God was taken, and that her father-in-law and her husband were dead, she bowed herself and travailed; for her pains came upon her. And about the time of her death the women that stood by said unto her, Fear not; for thou hast born a son. But she answered not, neither did she regard it. And she named the child I-cha-bod, saying, The glory is departed from Israel." 1 Samuel 4: 19 - 21.

Precipitate Labour seems to have been fairly common during the sojourn of the Israelites in Egypt. In this connection it is interesting to note that the contention that advancement in civilisation makes women less able to bear children is upheld by the comment of the midwives when the Egyptian king remonstrated with them for not reducing the overplus of live births, particularly of male children, among the Israelites: "The Hebrew women are not as the Egyptian woman; for they are lively, and are delivered ere the midwives come." Exodus 1 : 19.

It has been hinted that the rapid births were expedited by the thought of a visit from the same two midwives -

Shiphrah and Puah!

Probably members of the general public in reading George Eliot's "Adam Bede" have wondered - as I did when I read it before I was a medical student - if the writer did not portray the impossible when she told of Hetty Sorrel walking away immediately after giving birth to her unwanted child. That scene was recalled to the writer of this Thesis one morning when, amidst a tropical downpour which had lasted for hours, an African woman entered the dispensary. She had walked along narrow bush-paths for eight miles through the deluge of rain. Early that morning she had given birth to a child, but the after-birth had not come away, so she set off to the Mission Hospital, where, she believed, things would be put right. The child was dead but it was still attached to her body simply because, as already mentioned, Africans do not believe in severing the umbilical cord until the placenta has come away. Despite her experience that woman survived.

Difficult Labour. We have an example of this in Rachel giving birth to Benjamin. Exhaustion, from a previous delicate state, and haemorrhage were probably the causes of the death which her husband Jacob never ceased to mourn:

"And they journeyed from Bethel; and there was but a little way to come to Ephrath: and Rachel travailed, and she had hard labour. And it came to pass, when she was in hard labour, that the midwife said unto her, Fear not; thou shalt have this son also. And it came to pass as her soul was departing, for she died, that she called his name Ben-oni (= son of my sorrow): but his father called him Benjamin (= son of the right hand)." Genesis 35: 16 - 18.

Twins. Two outstanding cases of twin-birth are recorded in the Bible. Rebekah gave birth to Esau and Jacob, and Tamar bore Pharez and Zarah:

"And Isaac entreated the Lord for his wife, because she was barren; and the Lord was entreated of him, and Rebekah his wife conceived. And the children struggled together within her; and she said, If it be so, why am I thus? And she went to enquire of the Lord. And the Lord said unto her, Two nations are in thy womb, and two manner of people shall be separated from thy bowels; and the one people shall be stronger than the other people; and the elder shall serve the younger. And when her days to be delivered were fulfilled, behold, there were twins in her womb. And the first came out red, all over like a hairy garment; and they called him Esau. And after that came his brother out, and his hand took hold on Esau's heel; and his name was called Jacob: And Isaac was three-score years old when she bare them." Genesis 25:21-26.

Apparently Esau had persistent lanugo. Though he may not have been so extreme a case as the Russian 'dog-man', it seems evident that he had the condition in a marked degree.

The story of Tamar's bearing Pharez and Zarah claims close attention, for we find portrayal of abnormal position, abnormal presentation, and spontaneous evolution. Added to these there was seemingly a perineal tear because of the unexpected delivery of Pharez:

"And it came to pass, in the time of her travail, that, behold, twins were in her womb. And it came to pass, when she travailed, that the one put out his hand; and the midwife took and bound upon his hand a scarlet thread, saying, This came out first. And it came to pass, as he drew back his hand, that, behold, his brother came out: and she said, How hast thou broken forth? this breach be upon thee: therefore his name was called Pharez (= a breach). And afterward came out his brother, that had the scarlet thread upon his hand: and his name was called Zarah (= East or Brightness). Genesis 38:27-30.

It is evident from the foregoing narrative that Tamar had an abnormally roomy pelvis.

Uterine Inertia is figuratively referred to in the Book of Kings and the Prophecy of Isaiah: "Thus saith Hezekiah, this day is a day of trouble, and of rebuke, and blasphemy: for the children are come to the birth, and there is not strength to bring forth." 2 Kings 19:3 and Isaiah 37:3. It is to be noted that both passages are in exactly the same words.

Child Welfare. The use of salt, as cited in Ezekiel, was supposed to harden the skin and strengthen the child:

"As for thy nativity, in the day thou wast born thy navel was not cut, neither wast thou washed in water to supple thee; thou wast not salted at all, nor swaddled at all. None eye pitied thee, to have compassion upon thee; but thou wast cast out in the open field, to the loathing of thy person, in the day that thou wast born. And when I passed by thee, and saw thee polluted in thine own blood, I said unto thee when thou wast in thy blood, Live; yea, I said unto thee when thou wast in thy blood, Live.. Then washed I thee with water; yea, I thoroughly washed away thy blood from thee, and anointed thee with oil."
Ezekiel 16 : 4 - 9.

Apart from the above picture of attention to the newborn child, the Scripture references to child welfare are mostly in regard to lactation and weaning. The following is typical of a number: "Hadad found great favour in the sight of Pharaoh, so that he gave him to wife the sister of his own wife, the sister of Tahpenes the queen. And the sister of Tahpenes bare him Gerubath his son, whom

Tahpenes weaned in Pharaoh's house." 1 Kings 11 : 19 & 20.

One has not heard among other peoples of a feast of weaning such as Abraham gave for Isaac: "And the child grew, and was weaned: and Abraham made a great feast the same day that Isaac was weaned." Genesis 21 : 8.

In Luke's Gospel - 21:23 and 23:26-30 - Christ foretells the plight of those nursing and carrying children when calamity should overtake Jerusalem. His words were fulfilled when Rome's encircling hordes caused famine. Josephus relates that a Jewish woman ate her own child in the siege, so desperate were the people made by starvation. The inhabitants resented every fresh birth.

Overlying. King Solomon's handling of the dispute between two women who both claimed the one child has always evoked admiration. A doctor has his interest stimulated since the medico-legal aspect comes into the case, as the death of the second child in the drama was stated to be from overlying:

"Then came there two women that were harlots unto the king, and stood before him. And the one woman said, O my lord, I and this woman dwell in one house; and I was delivered of a child with her in the house. And it came to pass the third day after that I was delivered, that this woman was delivered also: and we were together; there was no stranger with us in the house, save we two in the house. And this woman's child died in the night; because she overlaid it."

1 Kings 3 : 16 - 19.

For the continuation and result of the altercation between the two women, see Section of Medical Jurisprudence.

Gynaecology. One of the most touching scenes in the New Testament is the staunching of the blood of the woman who suffered from metrorrhagia. Despite the fact that Luke was himself a physician, in his Gospel story he is almost as frank as Mark, who, describing the woman's plight, writes:

"And a certain woman, which had an issue of blood twelve years, And had suffered many things of many physicians, and had spent all that she had, and was nothing bettered, but rather grew worse. When she heard of Jesus, came in the press behind, and touched his garment. For she said, If I may touch but his clothes, I shall be whole. And straightway the fountain of her blood was dried up; and she felt in her body that she was healed of that plague. And Jesus, immediately knowing in himself that virtue had gone out of him, turned him about in the press, and said, "Who touched my clothes? And his disciples said unto him, Thou seest the multitude thronging thee, and sayest thou, "Who touched me? And he looked round about to see her that had done this thing. But the woman, fearing and trembling, knowing what was done in her, came and fell down before him, and told him all the truth. And he said unto her, Daughter, thy faith hath made thee whole; go in peace, and be whole of thy plague."

Mark 5 : 25 -34 and Luke 8 : 43 - 48.

Metritis and uterine fibroids have been given as the diagnosis.

The Virgin Birth. The Birth of Jesus, about which theologians and others have debated so much, is admittedly an altogether extraordinary and supernatural happening. The medical writer Luke - the only Gentile who penned parts of the New Testament - gives a wealth of detail which confirms his own belief in the miraculous happening. It is probable that he received the details from Mary the mother of

our Lord. See Luke chapters 1 and 2.

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THE SPECIALTIES

Ophthalmology

Ear, Throat and Nose

Insanity

Diseases of Children

Skin Diseases

THE SPECIALTIES - Ophthalmology; Ear, Throat and Nose; Insanity; Diseases of Children; and Skin Diseases are represented in Scripture.

Ophthalmology. Consideration for the blind is commanded in the Levitical Law: "Thou shalt not...put a stumbling-block before the blind." Leviticus 19:14. "Cursed be he that maketh the blind to wander out of the way." Deut. 27:18. Isaac and Eli are both stated to have had eyes which 'waxed dim' by reason of age: "And it came to pass, that when Isaac was old, and his eyes were dim, so that he could not see, he called Esau his eldest son." Genesis 27 : 1. "And it came to pass at that time, when Eli was laid down in his place, and his eyes began to wax dim, that he could not see." 1 Samuel 3 : 2.

Ahijah's condition was also that he "could not see; for his eyes were set by reason of age." 1 Kings 14 : 4.

Ahijah was a prophet who had the temerity to speak plain words to those in power.

Jacob's wife Leah is generally thought to have been beautiful because she has been described as 'tender eyed'. In contradiction to this it has been asserted that she probably suffered from blepharitis: "Leah was tender-eyed; but Rachel was beautiful and well favoured." Genesis 29:17.

The prevalence of blindness in Bible records is in keeping with the widespread eye troubles in tropical and sub-tropical countries to-day.

The blind seem to have moved profoundly the compassion of Jesus. In one instance the cure specially arrest attention. Jesus adopted two stages in the treatment, asking the man the result after the first application. Jesus seemed to concentrate particularly in the case - and incidentally gave a contradiction to the thought that He sought to convince men of His claims by displays of power - for before commencing the cure He first led the man out of the town:

"And He cometh to Bethsaida; and they bring a blind man unto him, and besought him to touch him. And he took the blind man by the hand, and led him out of the town; and when he spit on his eyes, and put his hands upon him, he asked him if he saw ought. And he looked up, and said, I see men as trees, walking. After that he put his hands again upon his eyes, and made him look up: and he was restored, and saw every man clearly. And he sent him away to his house, saying, Neither go into the town, nor tell it to any in the town." Mark 8 : 22 - 26.

There are at least eight recorded instances of Jesus healing the blind, and more than one of these instances involved a plurality of persons. The mental alertness of the blind man mentioned in the ninth chapter of John's Gospel, adds interest to a fascinating story.

One has a suspicion that Jesus was making somewhat merry over the respective sizes of the foreign bodies in two men's eyes:

"Why beholdest thou the mote that is in thy brother's eye, but considerest not the beam that is in thine own eye? Or how wilt thou say to thy brother, Let me pull out the mote out of thine eye; and, behold, a beam is in thine own eye? Thou hypocrite, first cast out the beam out of thine own eye; and then shalt thou see clearly to cast out the mote out of thy brother's eye." Matt. 7 : 3 - 5.

There are two cases given in Scripture of temporary amaurosis. 1. That of Elymas on whom fell a mist and darkness so that he did not see the sun for a season, and who went about seeking someone to lead him by the hand.
Acts 13:11.

2. The Apostle Paul when he was struck down on the Damascus Road by a blinding light, and was thereafter three days without sight, until "there fell from his eyes as it had been scales." Acts 9 : 1 - 18.

It may be appropriate to note that there are those who contend that Paul suffered from epilepsy. Probably Dr. Parker, the noted preacher of the City Temple, London, enjoyed himself when he dealt with the supposed epileptic condition of Paul, and, in face of the change in Paul's life, sought an epidemic or pandemic of a like affliction in the words, "Fly abroad! thou mighty epilepsy!"

Professor Rendle Short suggested that St. Paul's 'thorn in the flesh' - 2 Corinthians 12:7 - may have been trachoma. This sore eye condition may account for Paul's frequent employment of amanuensis in the writing of his Epistles.

Ear, Throat and Nose. The expert in this field will not find many allusions to his specialty in the Bible.

Patience with the deaf is enjoined in the Levitical Law: "Thou shalt not curse the deaf...but shalt fear thy God."
Leviticus 19:14.

Reference has already been made to the picture of old

age in the last chapter of Ecclesiastes (page 30). The 'daughters of music' cannot be mistaken, but there are those who hold that the 'silver cord' points to the mechanism of hearing, and not to the spinal cord.

Moses trying to avoid the acceptance of the Egyptian Commission, and excusing himself on the grounds of his slowness of speech, gives us an interesting dialogue:

"And Moses said unto the Lord, O my Lord, I am not eloquent, neither heretofore, nor since thou hast spoken unto thy servant; but I am slow of speech, and of a slow tongue. And the Lord said unto him, Who hath made man's mouth? or who maketh the dumb, or deaf...? have not I the Lord? Now therefore go, and I will be with thy mouth, and teach thee what thou shalt say." Exodus 4:10-12.

The incident of Christ restoring the ear of Malchus, the high priest's servant, which had been cut off by Peter, reminds us that the replacing of the pinna of an ear, if the pinna has not been severed from its base, is more possible than might be expected: as the treatment of rugby and other accidents in our day has demonstrated. Luke, with John, notes that the ear struck was the right ear, but Luke is the only one who records the healing administered by Christ, though all the Evangelists tell of Peter's action and its result: "And one of them smote a servant of the high priest, and cut off his right ear. And Jesus answered and said, Suffer ye thus far. And he touched the ear, and healed him." Luke 22 : 50 & 51.

As in Ophthalmology so in Otology Bible references centre round the healing work of Christ. Just as the blind

brought out the Master's compassion and help, so the deaf brought His power into play. "Great multitudes came unto him, having with them those that were...dumb...and cast them down at Jesus feet; and he healed them." Matt. 15:30. It was a matter of astonishment to the Galilean crowd that He made "both the deaf to hear, and the dumb to speak." Mark 7 : 37.

"And again, departing from the coasts of Tyre and Sidon, he came unto the Sea of Galilee, through the midst of the coasts of Decapolis. And they bring unto him one that was deaf, and had an impediment in his speech; and they beseech him to put his hand upon him. And he took him aside from the multitude, and putting his fingers into his ears, and he spit, and touched his tongue; And, looking up to heaven, he sighed, and saith unto him, Ephphatha, that is, Be opened. And straightway his ears were opened, and the string of his tongue was loosed, and he spake plain. And he charged them that they should tell no man; but the more he charged them, so much the more a great deal they published it: and were beyond measure astonished, saying, he hath done all things well." Mark 7:31 - 37.

Helen Keller, the blind, deaf and dumb genius, has said that had she her life to live over again, she would intensify her labours for the amelioration of the lot of the deaf and dumb, as they probably require more helpful sympathy and understanding than others.

We have in the Bible figurative references, involving blessing and denunciation, to the deaf and dumb by such as the Prophet Isaiah. Isaiah 35:5 & 6. The same prophet speaks also of a fierce people of deeper speech than can be perceived, and a stammering tongue that cannot be understood. Isaiah 33 : 19.

Insanity. It is evident that in ancient times not only the poor but also the insane were always with them. There are a number of cases of alien disease recorded in the Old and New Testaments.

King Saul is a typical case of recurring paroxysmal mania. In his connected history we find depression succeeding exaltation, and jealousy leading to several attempts at homicide. These fits of depression increase until, finally, Saul commits suicide. The paragraphs are worthy of citation:

"When they came thither to the hill, behold a company of prophets met him;..and he (Saul) prophesied among them. 1 Samuel 10:10. And Samuel came to Saul; and Saul said unto him, Blessed be thou of the Lord: I have performed the commandment of the Lord. 1 Sam.15:13. Saul's servants said unto him, Behold now, an evil spirit from God troubleth thee. Let our Lord now command thy servants, which are before thee, to seek out a man, who is a cunning player on an harp: and it shall come to pass, when the evil spirit from God is upon thee, that he shall play with his hand, and thou shalt be well. And Saul said unto his servants, Provide me now a man that can play well, and bring him to me...And it came to pass, when the evil spirit from God was upon Saul, that David took an harp, and played with his hand: so Saul was refreshed, and was well, and the evil spirit departed from him.

1 Samuel 16:15-17, 23.

It came to pass on the morrow, that the evil spirit from God came upon Saul...and David played with his hand, as at other times: and there was a javelin in Saul's hand. And Saul cast the javelin; for he said, I will smite David even to the wall with it. And David avoided out of his presence twice.

1 Samuel 18: 10 & 11.

Jonathan answered Saul his father, and said unto him, Wherefore shall he (David) be slain? what hath he done? And Saul cast a javelin at him to smite him: whereby Jonathan knew that it was determined of his father to slay David. 1 Samuel 20:32 & 33.

He (Saul) stripped off his clothes also, and prophesied before Samuel in like manner. 1 Sam. 19:24.

Saul fell straightway all along on the earth, and

was sore afraid...and there was no strength in him.

1 Samuel 28 : 20.

Then said Saul unto his armourbearer, Draw thy sword, and thrust me through therewith...But his armourbearer would not; for he was sore afraid. Therefore Saul took a sword, and fell upon it."

1 Samuel 31 : 4.

Nebuchadnezzar was another king who suffered from Mania.

No longer fit for human society he was driven out. His body became so unkempt that his hair was matted till it resembled eagles' feathers, and his nails were like birds' claws. But later, he lifted up his eyes and his understanding returned.

Daniel 4 : 33 & 34.

Paranoia is an alternative diagnosis of Nebuchadnezzar's sickness.

King David's feigned insanity before the king of Gath, when he sought refuge at that monarch's court because of Saul's pursuit, is perhaps the most ludicrous incident in the whole range of Scripture. One wonders that David's sense of humour did not become too much for him to carry the thing off! And did Achish, King of Gath, see through the game and chuckle when he appealed to his courtiers?:

"David arose, and fled that day for fear of Saul, and went to Achish the king of Gath. And the servants of Achish said unto him, Is this not David the king of the land? did they not sing one to another of him in the dances, saying, Saul hath slain his thousands, and David his ten thousands? And David laid up these words in his heart, and was sore afraid of Achish king of Gath. And he changed his behaviour before them, and feigned himself mad in their hands, and scrabbed on the doors of the gate, and let his spittle fall down upon his beard. Then said Achish unto his servants, Lo, ye see the man is mad? wherefore have ye brought him to me? Have I need of mad men, that ye have brought this fellow to play the mad man in my presence? shall this fellow come into my house?"

1 Samuel 21 : 10 - 15.

Doubtless David sought to procure immunity from injury by feigning madness, for even to-day many primitive tribes refrain from interfering with the insane unless the afflicted person is dangerously violent.

Jesus and the Treatment of the Insane.

That Jesus was familiar with mental diseases is seen in more than one detailed account recorded by the Evangelists. True, as has been remarked, "with the imperfect development of medical science in those days, differences in disease passed unnoticed, so that general names - e.g. unclean spirit - would be used for the classification of forms which modern science would distinguish."

Mania seems to have been the most outstanding mental illness in Jesus day, doubtless because the presence of men and women so afflicted was most felt by the public at large.

Jesus meeting the insane in various places, e.g., in the synagogue, open spaces, and among the tombs, is in keeping with what is found in many quarters of the world to-day.

Vivid indeed is Luke's picture of the typical maniac who dwelt in the tombs, and "whom no man could bind, no, not with chains." The Physician-Evangelist in his description of this patient coined another phrase which has passed into current speech, when he told of the cured condition being proved by the man "sitting at the feet of Jesus, clothed, and in his right mind."

"And they arrived at the country of the Gaderenes, which is over against Galilee. And when he went

forth to land, there met him out of the city a certain man, which had devils long time, and ware no clothes, neither abode in any house, but in the tombs... (For oftentimes it had caught him; and he was kept bound with chains and in fetters; and he brake the bands, and was driven of the devil into the wilderness.) And Jesus asked him, saying, "What is thy name? And he said, Legion: because many devils were entered into him. And they besought him that he would not command them to go out into the deep. And there was there an herd of many swine feeding on the mountain: and they besought him that he would suffer them to enter into them. And he suffered them. Then went the devils out of the man, and entered into the swine: and the herd ran violently down a steep place into the lake, and were choked. When they that fed them saw what was done, they fled, and went and told it in the city and in the country. Then went they out to see what was done; and came to Jesus, and found the man out of whom the devils were departed, sitting at the feet of Jesus, clothed, and in his right mind." Luke 8:26-39.

See also Matt. 8:28-34 and Mark 5:1-18.

Luke also makes things live before our eyes when, in the Acts of the Apostles, he tells of the maniac who scared the 'quacks' who pretended to possess powers of divine healing: "The man in whom the evil spirit was leaped on them, and overcame them, and prevailed against them, so that they fled out of the house naked and wounded." Acts 19: 13 - 17. But probably Luke had far more pleasure in relating another instance of the Master's power to deliver the maniac:

"And in the synagogue there was a man which had a spirit of an unclean devil, and cried out with a loud voice, saying, Let us alone; what have we to do with thee, thou Jesus of Nazareth? art thou come to destroy us? I know thee who thou art; the Holy One of God. And Jesus rebuked him, saying, Hold thy peace, and come out of him. And when the devil had thrown him in the midst, he came out of him, and hurt him not. And they were all amazed, and spake among themselves, saying, What a word is this! for with authority and power he commandeth the unclean spirits, and they come out.

And the fame of him went out into every place of the country round about." Luke 4 : 33 - 37.

Other cases of mental illnesses are to be found in Luke 8 : 2; Mark 1 : 23 - 28; and Acts 8 : 7.

In the Parable of the unclean spirit leaving a man and returning to him after seeking rest and finding none, the primary meaning seems plain - that the heart must ^{not} only be cleansed of evil but it also must be filled with good. May it not be, however, that Jesus also in this gave another example of His powers of penetration in hinting at the unenviable position of the cured lunatic - dogged by people's recollection of his previous state?:

"When the unclean spirit is gone out of a man, he walketh through dry places, seeking rest; and finding none, he saith, I will return unto my house whence I came out. And when he cometh he findeth it swept and garnished. Then goeth he, and taketh to him seven other spirits more wicked than himself; and they enter in, and dwell there: and the last state of that man is worse than the first." Luke 11 : 24 - 26.

Diseases of Children

That the Bible was ahead of its day is seen in its attitude to children:

"Since Ruskin drew the world's attention to the fact, many writers have emphasised that children are ignored in the classics of ancient Greece and Rome but flit in the New Testament with vivacity and freedom. When Xanthippe, at the final interview, brings her child (and his) to Socrates, we expect Plato to lift the curtain on an affecting scene, but he merely gives a glimpse, and to our disappointment it discloses the boy enfolded, not in the father's, but in the mother's arms."

In view of the Bible's attitude, we do not find it strange that there are a number of cases recorded of sicknesses of children. In a few lines we have a vivid picture of Mephibosheth's accident when still a child: "Jonathar, Saul's son, had a son that was lame of his feet. He was five years old when the tidings came of Saul and Jonathan out of Jezreel, and his nurse took him up, and fled; and it came to pass, as she made haste to flee, that he fell, and became lame. And his name was Mephibosheth." 2 Sam. 4:4. Doubts have been cast on this child's condition being an accident and nothing more. Tuberculosis of the bones has been suggested, which only showed itself after a knock. This at any rate seems feasible, particularly from the fact that a later reference is indicative of a chronic suppurative condition in Mephibosheth's old injuries, unless the passage merely refers to washing of the feet: "And Mephibosheth the son of Saul came down to meet the king (David), and had neither dressed his feet, nor trimmed his beard, nor washed his clothes, from the day the king departed until the day he came again in peace." 2 Samuel 19:24. King David had a tenderness for the physically unfit, for we find him inviting Mephibosheth to be his permanent guest, as he also invited old Barzillai. 2 Sam. 9th chap. & 2 Sam. 19:33-35.

A diagnosis of epilepsy is easy in the case of the boy whose father appealed so strongly to Jesus to do something for the lad:

"Master, I have brought unto thee my son, for he is a lunatick and sore vexed, which hath a dumb spirit. And wheresoever he taketh him, he teareth him, and bruising him hardly departeth from him: and he foameth, and gnasheth with his teeth, and pineth away: ...And they brought him unto him: and when he saw him, the spirit straightway tare him; and he fell on the ground, and wallowed foaming. And he asked his father, How long is it ago since this came unto him? And he said, Of a child. And oftentimes it has cast him into the fire, and into the waters, to destroy him...Jesus rebuked the foul spirit, saying unto him, Thou dumb and deaf spirit, I charge thee, come out of him, and enter no more into him. And the spirit cried, and rent him sore, and came out of him: and he was as one dead; inasmuch that many many said, He is dead. But Jesus took him by the hand and lifted him up; and he arose." Mark 9 : 17 - 27.

The parts underlined above indicate additions from the Gospels of Matthew and Luke.

Possibly the condition of the daughter of the Syrophenician woman was also epilepsy. See Mark 7 : 24 - 30.

One fails to find any clue to the sickness of Bathsheba's child. However, the circumstances of the child's death give proof of King David's superior poise of mind before the death and in his acceptance of the blow when it had fallen: and on that account the passage is worthy of quotation. His attitude is not that of the ordinary primitive man, who often tries one's patience with his inert fatalism in face of serious illness and his worked-up wailing after the death has occurred:

"David therefore besought God for the child; and David fasted, and went in, and lay all night upon the earth. And the elders of the house arose, and went to him, to raise him from the earth; but he would not, neither did he eat bread with them. And it came to pass on the seventh day, that the child died. And the servants of David feared to tell him that the child was dead: for

they said, behold, while the child was yet alive, we spake unto him, and he would not hearken unto our voice: how will he then vex himself, if we tell him that the child is dead? But when David saw that his servants whispered, David perceived that the child was dead: therefore David said unto his servants, Is the child dead? and they said, He is dead. Then David arose from the earth, and washed, and anointed himself, and changed his apparel, and came into the house of the Lord, and worshipped: then he came to his own house; and when he required, they set bread before him, and he did eat. Then said his servants unto him, "What thing is this that thou hast done? Thou didst fast and weep for the child, while it was yet alive: but when the child was dead, thou didst rise and eat bread. And he said, "While the child was yet alive, I fasted and wept: for I said, "Who can tell whether God will be gracious to me, that the child may live? But now he is dead, wherefore should I fast? can I bring him back again? I shall go to him, but he shall not return to me." 2 Samuel 12:15-23.

We are also baffled in an attempt to diagnose the disease that carried off the daughter of Jairus. But there is satisfaction in the considerate command of Jesus that "something be given her to eat." Mark 5:43.

One wonders how much medical knowledge was imparted to the "sons of the prophets." We find both Elijah and Elisha resuscitating children by a method which suggests direct insufflation as the type of artificial respiration employed: "And he (Elisha) went up, and lay upon the child, and put his mouth upon his mouth, and his eyes upon his eyes, and his hands upon his hands; and he stretched himself upon the child, and the flesh of the child waxed warm. 2 Kings 4:18-37. See also 1 Kings 17:17-24. References have already been made to instances of sunstroke and spinal meningitis in young people. See pages 28 and 17.

Diseases of the Skin

The range of skin diseases mentioned in the Bible is not a large one. There are diseases already mentioned under specific infections which have cutaneous manifestations, e.g. leprosy, small-pox, plague, venereal. In addition there is particular reference to the loathsome state accompanying oriental sore: "The Lord shall smite thee in the knees, and in the legs, with a sore botch that cannot be healed from the sole of thy foot unto the top of thy head." Deuter. 28:35. Varicose ulcers, as already stated, has been judged the affliction of Lazarus who lay at Dives gate. Luke 16 : 19 - 31.

There are five other diseases of the skin mentioned:

1. Tinea Tonsurans or Ringworm

This disease - differentially diagnosed from leprosy - is dealt with in some detail in the Levitical Law:

"And if the priest shall look on the plague of the scall, and, behold, it be not in sight deeper than the skin, and there is no black hair in it: then the priest shall shut him up that hath the plague of the scall seven days. And in the seventh day the priest shall look on the plague: and, behold, if the scall spread not, and there is in it no yellow hair, and the scall be not in sight deeper than the skin; He shall be shaven, but the scall shall he not shave; and the priest shall shut him up that hath the scall seven days more. And in the seventh day the priest shall look on the scall: and, behold, if the scall be not spread in the skin, nor be in sight deeper than the skin; then the priest shall pronounce him clean: and he shall wash his clothes and be clean." Leviticus 13 : 29 - 34.

2. Alopecia or Baldness. The Book of Leviticus makes it clear that baldness per se is not to be a matter of reproach or to be deemed associated with uncleanness: "The man whose

hair is fallen off his head, he is bald; yet is he clean. And he that hath his hair fallen off from the part of his head toward his face, he is forehead bald; yet is he clean." Levit. 13 : 40 & 41.

In certain instances baldness is caused by a life spent in excessive labour, with exposure to the sun. In the Book of Isaiah the condition is threatened as a mark of degradation, and in Ezekiel as a badge of servitude:

"Because the daughters of Zion are haughty, and walk with stretched forth necks, and wanton eyes, walking and mincing as they go, and making a tinkling with their feet...It shall come to pass, that instead of sweet smell there shall be stink; and instead of a girdle a rent; and instead of well-set hair baldness; and instead of a stomacher a girding of sackcloth; and burning instead of beauty." Isaiah 3: 16 & 24.

"Son of man, Nebuchadnezzar king of Babylon caused his army to serve a great service against Tyrus: every head was made bald, and every shoulder was peeled; yet had he not wages, nor his army, for Tyrus, for the service that he served against it." Ezekiel 29 : 18.

3. Favus or Scab is associated with the condition named as Scurvy in Leviticus 21:20. It certainly does not mean the disease named scurvy to-day. Favus is ringworm of a honey-comb type, which goes on to a scab and is much more difficult to treat than ordinary ringworm. This condition seems also indicated in the reference which cites the wayward and wanton daughters of Zion having a scab on the crown of the head. Isaiah 3 : 17.

4. Itch is probably what is known to us to-day as Scabies. This also, at times, spreads over the body and causes a crust or scab to develop. Like favus, itch can pass from

person to person. Both these conditions disqualified a man for the priesthood. Both diseases are threatened as punishments. Deuter. 28 : 27.

Perhaps in no section of biblical medicine can there be so little definiteness as in the remaining skin conditions. This is not surprising. To expect definiteness would be to expect Dermatology in its present-day advanced state.

5. Psoriasis might nevertheless be read into the following:

"If a man also or a woman have in the skin of their flesh bright spots, even white bright spots; Then shall the priest look; and, behold, if the bright spots in the skin of their flesh be darkish white; it is a freckled spot that groweth in the skin; he is clean."
Leviticus 13 : 38 & 39.

In tropical and sub-tropical countries one is appalled at the amount of suffering which arises from diseases of the skin. Dust, filth, lice, fleas and other insects, as well as impure water, all add their quota to the breaking down of the skin and the spread of ulcerative conditions. As in Bible times, so are things, largely, to-day.

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M E D I C A L J U R I S P R U D E N C E



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"If men strive together, and one smite another with a stone, or with his fist, and he die not, but keepeth his bed; If he rise again, and walk abroad upon his staff, then shall he that smote him be quit: only he shall pay for the loss of his time, and shall cause him to be thoroughly healed." Exodus 21:18 & 19.

"Ye shall appoint you cities to be cities of refuge for you; that the slayer may flee thither, which killeth any person at unawares. And they shall be unto you cities of refuge from the avenger; that the manslayer die not, until he stand before the congregation in judgment... six cities shall be a refuge, both for the children of Israel, and for the stranger, and for the sojourner among them." Numbers 35:11 - 25.

"When thou buildest a new house, then thou shalt make a battlement for thy roof, that thou bring not blood upon thine house, if any man fall from thence." Deuter. 22 : 8.

M E D I C A L J U R I S P R U D E N C E

It is a platitude to say that much of Modern Law has its roots in the Mosaic Code. The medical jurist has a fairly large field to survey in the details of the subject as they are found in Bible pages.

It is striking that so many of the directions and deductions which Moses laid down can be applied with benefit to our own day. With the advent of the Welfare State we are inclined to imagine that we have evolved much which was not even thought of before our own day, but that is far from being the case. Our Workmen's Compensation Act is of comparatively recent date, but the substance of it was laid down thousands of years ago in the Mosaic Law, as can be seen by glancing at the Foreword to this Section.

Sometimes it is averred that the law 'an eye for an eye and a tooth for a tooth', is a vengeful one. Certainly Jesus enunciated a higher law; but the original law can also be read as restrictive, curbing a man when his ire was roused and forbidding him to go all out for double measure in retaliation. This restraint is also seen in the establishment of the Cities of Refuge and the laws which governed their usage. Insistence on judicial handling of all such cases, and the refusal to encourage vengeful feelings when the hot blood was uppermost, were the chief motives behind such provisions.

Care was also taken to prevent accidents occurring, as

seen by the stipulation that a parapet or battlement must be provided for the flat roofs of the houses.

The laws laid down in the Book of Leviticus concerning the circle of relationships within which marriage was prohibited, are largely as we find them listed in the closing page of the Book of Common Prayer.

The descriptions given in the Books of Genesis and Judges of sex obsession are just what is found in primitive life to-day. Added to the enervating effects of hot climates, and the undermining of physique by diseases such as malarial fever, the inhabitants of such lands are heavily handicapped by hereditary and environmental circumstances, inclining them to allow sexual matters to occupy rather much of their time and thought.

Those who advocate the removal of the Book of Genesis from the Canon of Scripture, simply prove that they have little knowledge of primitive life as it was in the past and as it is to-day. That Book, with its pictures of the elemental passions of an early pastoral people, taken at its lowest, is a balanced document of great anthropological, and, it might be added, of medical value.

Moses has rightly been hailed as an outstanding lawgiver, or transmitter as he probably would have said. And the laws associated with his name have definitely left their impress on the world's Medical Jurisprudence.

Wounds. The instances given in the Bible of men who suffered from the infliction of wounds show a variety of weapons and missiles employed. To take a few: Ahab died of haemorrhage because "a certain man drew a bow at a venture, and smote the king of Israel between the joints of the harness (between the lower armour and the breast-plate - R.V.)...and the blood ran out of the wound into the midst of the chariot." 1 Kings 22 : 34 & 35.

Goliath died from a wound in the forehead inflicted by 'the boy David' by means of a sling and stone. 1 Sam.17:49. Two adulterers were put to death by Phineas who "rose up from among the congregation, and took a javelin in his hand ...and thrust both of them through." Numbers 25 : 7 & 8. Baal's prophets cut themselves with knives and lancets. 1 Kings 18 : 28.

The side of Jesus Christ was pierced by a spear. John 19:34. Present day methods of the medical jurist would have confirmed that the Lord's wound was a post-mortem one.

Criminal Offences particularly instanced in Scripture are numerous. Murder, manslaughter and common assault are minutely dealt with both in regard to the evidences required and the punishments to be meted out.

Murder. It was laid down with great emphasis in the Mosaic Law that the taking of life wittingly and by intent must be punished resolutely: "At the hand of every man's brother will I require the life of man, whoso sheddeth man's blood, by man shall his blood be shed: for in the image of God

made he man." Genesis 9 : 5 & 6.

"If a man come presumptuously upon his neighbour, to slay him with guile; thou shalt take him from mine altar, that he may die." Exodus 21:14. "Moreover ye shall take no satisfaction (ransom - R.V.) for the life of a murderer, which is guilty of death; but he shall surely be put to death." Numbers 35 : 31.

The time spent in reading carefully the 35th chapter of the Book of Numbers will be amply repaid; here it is laid out in the greatest detail the variety of weapons by which a man may meet his death - instrument of iron, stone, weapon of wood - whether those weapons were in the hands of a man who had murder in his heart or who quite unwittingly was the cause of another's death. Also the rules are carefully detailed which should guide the judges or elders of the Cities of Refuge when trying such cases.

It is expressly laid down that without doubt there must be proof of the deed and of the evil intent.

"Who so killeth a person, the murderer shall be put to death by the mouth of witnesses: but one witness shall not testify against a person to cause him to die." Numbers 35:30. The requirement of more than one witness to establish guilt is inherent in British Law to-day.

Instances of Death by Violence. We are not told by what means Cain took the life of his brother Abel. It is possible to argue that this was not a case of murder, but rather

one of manslaughter. This may explain Cain's punishment being less than death. Genesis 4 : 8 - 15.

Jael's murder of Sisera was deliberate and cold-blooded, being carried out with amazing resolution for a woman. She not only struck the tent-pin through his temple and fastened it in the ground, but when Barak the pursuer of Sisera arrived she came out to meet him and said to him: "Come, I will show thee the man whom thou seekest. And when he came into her tent, behold, Sisera lay dead and the nail (tent-pin - R.V.) was in his temples." Judges 4 : 22.

In the case of Hazael's murder of king Ben-hadad suffocation was brought about by means of a wet cloth. In the account given of Ben-hadad's death we see duplicity and cruelty by which Hazael could usurp the place of his master and callously plan treason:

"And Hazael said, Why weepeth my lord? And he (Elisha) answered, Because I know the evil that thou wilt do unto the children of Israel: their strongholds thou wilt set on fire, and their young men wilt thou slay with the sword, and wilt dash their children, and rip up their women with child. And Hazael said, But what! is thy servant a dog, that he should do this great thing? And Elisha answered, The Lord hath showed me that thou shalt be king over Syria. So he departed from Elisha, and came to his master: who said to him, What said Elisha to thee? and he answered, He told me that thou shouldst surely recover. And it came to pass on the morrow, that he took a thick cloth, and dipped it in water, and spread it on his face, so that he died: and Hazael reigned in his stead." 2 Kings 8 : 12 - 15.

Jehu's killing of Jezebel makes even more vivid and gruesome reading:

"When Jehu was come to Jezreel, Jezebel heard of it:

and she painted her face, and tired her head, and looked out at a window. And as Jehu entered in at the gate, she said, Had Zimri peace, who slew his master? And he lifted up his face to the window and said, Who is on my side? who? And there looked out to him two or three eunuchs. And he said, Throw her down. So they threw her down: and some of her blood was sprinkled on the wall, and on the horses; and he trod her under foot. And when he was come in, he did eat and drink, and said, Go, see now this cursed woman, and bury her; for she is a king's daughter. And they went to bury her; but they found no more of her than the skull, and the feet, and the palms of her hands... In the portion of Jezreel shall dogs eat the flesh of Jezebel."

2 Kings. 9 : 30 - 36.

Jehu's forcefulness earned for him more than a name for furious driving - 2 Kings 9:20. That the pariah dogs, which seem to have abounded in the Middle East from time immemorial to the present day, were capable of doing what is above indicated, is not to be doubted.

Capital Punishment. Among the Jews the execution of those condemned to death took various forms. Hanging was one form, and perhaps Haman suffered death in this way on a gallows which was seventy-five feet high, as described in the Book of Esther - 7th chapter. But hanging seems in most cases to have been resorted to after the victim had been killed; which reminds of the custom in the past in our own country when portions of the bodies of those executed were hung in public places. Joshua meted out this indignity to five kings whom he first imprisoned in a cave till the battle in which they were captured was over:

"Joshua smote them, and slew them and hanged them on five trees: and they were hanging upon the trees

until the evening. And it came to pass at the time of the going down of the sun, that Joshua commanded, and they took them down off the trees, and cast them into a cave wherein they had been hid, and laid great stones in the cave's mouth, which remain until this day." Joshua 10 : 26 & 27.

Whatever the faults of King Saul's daughters, we cannot withhold admiration from Rizpah for so faithfully watching the hanging bodies of her two sons and those of the five adopted sons of her sister Michal:

"The king took the two sons of Rizpah...and the five sons of Michal the daughter of Saul...and he delivered them into the hands of the Gibeonites, and they hanged them in the hill...And Rizpah the daughter of Aiah took sackcloth, and spread it for her upon the rock, from the beginning of harvest until the water dropped upon them out of heaven (till the rains fell from the sky upon the bodies - Moffat), and suffered neither the birds of the air to rest upon them by day, nor the beasts of the field by night." 2 Samuel 21 : 8 - 10.

By his actions King David often showed himself a man above the average, as when he commanded that the bones of those seven men, and the bones of Saul and Jonathan, be buried in the grave of King Saul's father - Kish. 2 Samuel 21 : 12 - 14.

Stoning was the commonest form of judicial slaying: "All Israel stoned him (Achan) with stones." Joshua 7 : 25. The usual procedure seems to have been for the chief witness to cast the first stone and to hit the guilty person on the chest. If this did not kill him, other bystanders hurled more stones until death supervened. It must have been a vicious scene. Stephen, the first Christian martyr was killed in this way, and to give freedom of action

those who threw the stones took off their upper garments, which were taken care of by a young man named Saul, who was later the Apostle Paul. Acts 7 : 54 - 60.

Burning was also employed to put to death a man who took to wife both a woman and her mother. All three were to be "burnt with fire". Leviticus 20:14. This punishment was called for by Judah against his daughter-in-law Tamar, when it was reported that she had played the harlot: "And Judah said, Bring her forth, and let her be burnt." Genesis 38:24. This story takes a curious turn when it is revealed that it was Judah himself who had committed adultery with Tamar - not knowing who she was!

Beheading was also employed by the Jews, but mostly on enemies, the beheading being done within or without the gates:

"Then he (Jehu) wrote a letter the second time to them, saying, If ye be mine, and if ye will hearken unto my voice, take ye the heads of the men your master's sons, and come to me to Jezreel by to-morrow this time. Now the king's (Ahab) sons, being seventy persons, were with the great men of the city, which brought them up. And it came to pass, when the letter came to them, that they took the king's sons, and slew seventy persons, and put their heads in baskets, and sent them to Jezreel." 2 Kings 10 : 6 & 7.

Crucifixion was not a Jewish but a foreign method of execution.

Sawing asunder implied a crushing of the body between iron instruments. Hebrews 11 : 37.

Accidental Death. While emphasis was laid on the necessity of punishment in cases of murder, ample provision was made

for the protection of the man who took the life of another by accident. Six Cities of Refuge were appointed throughout the land, to any of which an unwitting taker of another's life might resort and find a safe haven from 'the avenger of blood' till he was given a fair trial in the Court of the Elders. In the Foreword to this Section of Medical Jurisprudence is found an account of the establishment of those Cities of Refuge. Two further paragraphs detail what types of cases are to be protected in this way:

"This is the case of the slayer which shall flee thither, that he may live: who so killeth his neighbour ignorantly, whom he hated not in time past; as when a man goeth in to the wood with his neighbour to hew wood, and his hand fetcheth a stroke with the ax to cut down the tree, and the head slippeth from the helve, and lighteth upon his neighbour, that he die." Deut. 19:4 & 5.

"If he thrust him suddenly without enmity, or have cast upon him anything without lying in wait, or with a stone, wherewith a man may die, seeing him not, and cast it upon him, that he die, and was not his enemy, neither sought his harm: Then the congregation shall judge between the slayer and the avenger of blood according to these judgments: and the congregation shall deliver the slayer out of the hand of the revenger of blood, and the congregation shall restore him to the city of his refuge whither he was fled." Numbers 35:22-25.

It is plain that there is nothing nebulous in the laws passed: there are precedents and possible eventualities ready at hand to be cited in case of need. It is the care in detailing the law's requirements and protections which impresses one on reading the medical jurisprudence of so ancient a time.

Absalom's death resulted from a curious accident. Doubtless

he had reason to be proud of his head of hair, but his locks were the means of his undoing:

"Absalom rode upon a mule, and the mule went under the thick bows of a great oak, and his head caught hold of the oak, and he was taken up between the heaven and the earth; and the mule that was under him went away... And Joab took three darts in his hand, and thrust them through the heart of Absalom, while he was yet alive in the midst of the oak."

2 Samuel 18 : 9 - 14.

As has already been pointed out, it was required that all reasonable steps be taken to prevent accidents, such as falls from the flat roofs of the houses, which accidents might have been common but for the injunction to erect a battlement or parapet as part of all such roofs.

The Law not only enjoined all reasonable precautions to be taken, but it decreed that compensation be paid to those who suffered by want of care on the part of others, and this leads us to observe with admiration the rules laid down in judging such cases as might call for compensation.

Compensation for Injury. Our text-books on Medical Jurisprudence generally deal with abortion from the point of view of a woman criminally seeking to procure it, or a doctor ^{or} other person aiding or abetting her in her desire to get rid of the fruit of her womb. The Mosaic Law treats the subject from a different angle. What part a woman might have "in men striving" - whether she sought to separate them, or the shock to her feelings in seeing them fighting, is not detailed - but the dire and undesired results of such strife are to be taken into account: "If men strive,

and hurt a woman with child, so that her fruit depart from her, and yet no mischief follow: he shall be surely punished, according as the woman's husband shall lay upon him: and he shall pay as the judges determine. And if any mischief follow, then thou shalt give life for life."

Exodus 21 : 22 & 23.

A master might pay dearly for an outburst of temper which led him to strike a servant. The servant implied was evidently a bond-servant: "If a man smite the eye of his servant, or the eye of his maid, that it perish; he shall let him go free for his eye's sake. And if he smite out his man servant's tooth, or his maid-servant's tooth, he shall let him go free for his tooth's sake." Exodus 21 : 26 & 27.

Unwillingness to part with a vicious ox might cost a man very dearly. In our own day we read of a vicious dog or other animal being ordered to be shot, but we do not deal so drastically with their owners as they were dealt with in Old Testament times:

"If an ox gore a man or woman, that they die: then the ox shall be surely stoned, and his flesh shall not be eaten; but the owner of the ox shall be quit. But if the ox were wont to push with his horn in time past, and it hath been testified to his owner, and he hath not kept him in, but that he hath killed a man or woman; the ox shall be stoned, and his owner shall be put to death. If there be laid on him a sum of money, then shall he give him for the ransom of his life whatsoever is laid upon him. Whether he have gored a son, or have gored a daughter, according to this judgment shall it be done unto him. If the ox shall push a man-servant, or a maid-servant; he shall give unto their master thirty shekels of silver, and the ox shall be stoned." Exod. 21: 28-32.

Adultery : Prostitution : Unnatural Offences

The above crimes were heavily indicted in the Mosaic Law. The details of such offences are not glossed over in the Bible, and the cases mentioned are often most glaring. The Jews have undoubtedly benefited from the standard of their domestic life being above the average.

Where bestiality was the crime, the animal was also killed in an endeavour to obliterate all memory of the deed. This last heinous act is described as 'confusion'. Levit. 18:23.

Death to both parties was the penalty for immorality between a man and a married woman. The betrothed girl was put in the same category, and liable to the same penalty, as the married woman.

The implied consent of the betrothed girl who was raped inside a city, but who cried not, was deemed worthy of the highest penalty - both were to be stoned; the man because "he hath humbled his neighbour's wife"; the girl because she cried not. Deuter. 22:24. But if the deed took place in a field, only the man was to be put to death: "If a man find a betrothed damsel in the field, and the man force her, ...the man only... shall die. But unto the damsel thou shalt do nothing: there is in the damsel no sin worthy of death: for as when a man riseth against his neighbour, and slayeth him, so is this matter: For he found her in the field, and the betrothed damsel cried, and there was none to save her." Deuter. 22 : 25 - 27.

In the case of a girl not betrothed, the man was due to pay fifty shekels of silver to the girl's father, and he must accept the girl as his wife, "Because he hath humbled her, he may not put her away all his days." Deut. 22:28&29.

Instances of Immorality. An instance of immorality is given in the gross conduct of Reuben, Jacob's eldest son, towards his father's concubine Bilhah. This was something Jacob never forgot nor forgave. On his deathbed he stigmatised Reuben in the words, "Reuben...unstable as water, thou shalt not excel ...he went up to my couch." Into the story of Joseph we have a parenthesis inserted in the tale of Judah's dealings with his daughter-in-law. In this interpolation we are told of an act of coitus-interruptus practised in that far off day.
Genesis 38 : 9.

Rape. In the Books of Genesis - 19th chapter - and Judges - also 19th chapter - we have two similar and revolting stories which show the subjection of primitive women to the will and dictates of men. To-day we cannot conceive of men openly claiming to practise sodomy - the origin of the word 'sodomy' is to be noted - as did the men of Sodom. Nor can we imagine men acting towards a daughter or mistress as did Lot and the Levite. The humbling of a daughter, as in the cases cited, was later provided against in the law forbidding prostitution. Leviticus 19 : 29.

Amnon's conduct towards his sister Tamar is inexplicable unless we simply dismiss him as a moral pervert. Absalom's

plot for revenge and the carrying of it out was ruthless. If there is a desire for a human short story, one has it in the Second Book of Samuel - the thirteenth chapter. In that story the elemental passions have full play.

Incest. In the story of Lot and his two daughters there is the record of amazing acts of incest, inexcusable even in the light of strong primitive and natural desires to avoid barrenness. Genesis 19 : 30 - 38.

False accusations of immorality. Mrs. Craik - the author of 'John Halifax, Gentleman' - has appraised the Story of Joseph as one of the finest short stories in the world's literature. In that story we have displayed the wiles and craftiness of a licentious woman to overcome the innocence of a decent lad. Genesis 39th chapter. In setting up Hebrew Law steps were taken to protect young people, girls in particular, from an evil name imputed to them in the matter of accusations of immorality. Deuter. 22 : 13 - 21.

Medical grounds for Divorce. In the Book of Deuteronomy - 24th chapter - there is the suggestion that the finding of gonorrhoea in a woman is a just ground for divorce. In the Authorised Version of Scripture the condition is named "uncleanness" and in the Revised an "unseemly thing". A wife found with such a condition on marriage is described as finding no favour in her husband's eyes; and after divorce, on her marrying again, the second husband is spoken of as probably hating her.

Law of Jealousies or Suspicion. In the Law provision was made for even the appearance of jealousy in a husband against a wife, with or without cause. One wonders what was the nature of "the bitter water that causeth the curse" which was so effectual in deciding what is so often in the nature of things a matter of extreme difficulty.

Numbers 5 : 12 - 28.

Consanguinity and Marriage. The circle of relationship within which marriage was prohibited, as set forth in the eighteenth chapter of the Book of Leviticus, is almost identical with what is generally accepted in civilised states at the present day.

Proper marriage received every encouragement among the Jewish people, even to the extent of passing an extraordinary law which reads: "When a man hath taken a new wife, he shall not go out to war, neither shall he be charged with any business: but he shall be free at home one year, and shall cheer up his wife which he hath taken."

Deuter. 24 : 5.

Mutilation and Tattooing. In most primitive tribes various small or large mutilations in the flesh are common as tribal or other marks. Tattooing is also a familiar practice, though by no means confined to primitive peoples! In the Levitical Law we find embargoes on such customs: "Ye shall not round the corners of your heads, neither shalt thou mar the corners of thy beard. Ye shall not make any cuttings in your flesh for the dead, nor print any marks

upon you." Leviticus 19 : 27 & 28.

Suicide. If mutilation and tattooing were forbidden, the taking of one's own life was still more vetoed. It is interesting to note that four outstanding cases of suicide mentioned in Scripture are all of men who in other ways had been weighed in the balance and found wanting:

1. King Saul fell upon his sword when the battle went against him and the enemy archers wounded him. He had recourse to death by his own hand "Lest" he said, "these uncircimcised come and abuse me." 1 Chron. 10: 3&4. It is not to be forgotten that 2 Sam. 1:10 states an Amalekite claimed to add the finishing touch.
2. Zimri when he found conspiracy and treason did not bring him the desired results, "went into the palace of the king's house, and burnt the king's house over him with fire, and died." 1 Kings 16 : 18.
3. Ahithophel's exit showed a neurotic's touchiness and deliberateness: "When Ahithophel saw that his counsel was not followed, he saddled his ass, and arose, and gat him home to his house, to his city, and put his household in order, and hanged himself and died." 2 Samuel 17 : 23.
4. Judas ran amok after his traitorous act, according to the account Peter gave in preaching: "This man purchased a field with the reward of iniquity; and falling headlong, he burst asunder in the midst and all his bowels gushed out." Acts 1 : 18.

Peter's language in his sermon may have been figurative since Matthew's account reads: "Then Judas...repented himself, and brought again the thirty pieces of silver to the chief priests and elders, saying, I have sinned in that I have betrayed the innocent blood...And he cast down the pieces of silver in the temple, and departed, and went and hanged himself." Matthew 27 : 3 - 5.

P U B L I C H E A L T H

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Mosaic Orders to soldiers:

"Do ye abide without the camp seven days: whosoever hath killed any person, and whosoever hath touched any slain, purify both yourselves and your captives on the third day, and on the seventh day. And purify all your raiment, and all that is made of skins, and all work of goats' hair, and all things made of wood... Only the gold, and the silver, the brass, the iron, the tin, and the lead, Everything that may abide the fire, ye shall make it go through the fire, and it shall be clean; nevertheless it shall be purified with the water of separation: and all that abideth not the fire ye shall make go through the water.

And ye shall wash your clothes on the seventh day, and ye shall be clean, and afterward ye shall come into the camp."

Numbers 31 : 19 - 24.

"If a woman have an issue, and her issue in her flesh be blood, she shall be put apart seven days: and whosoever toucheth her shall be unclean until the even. And every thing that she lieth upon in her separation shall be unclean: and every thing also that she sitteth upon shall be unclean. And whosoever toucheth her bed shall wash his clothes, and bathe himself in water, and be unclean until the even. And whosoever toucheth anything that she sat upon shall wash his clothes, and bathe himself in water, and be unclean until the even..."

But if she be cleansed of her issue, then shall she number to herself seven days, and after that she shall be clean."

Leviticus 15 : 19 - 28.

P U B L I C H E A L T H

As in Medical Jurisprudence so in Public Health the beginnings of modern principles are found in the Mosaic Code. Seelig in his "Medicine : An Historical Outline" says, "The ancient Jews like other Semitic peoples, were not pathfinders in medicine...In only one branch, public hygiene, were the early Jews pre-eminent; along this line they enjoy the reputation of being creators."

The Mosaic Law emphasised the benefits to be derived from personal, domestic and communal hygiene, but the foundations of all were based on the health-sense and the protection of the individual.

Personal defilement or uncleanness was reckoned on a variety of scores - by touching the dead body of a person or carcase of one of the lower animals; an issue in the flesh; nocturnal emissions; and childbirth made a woman unclean for a period.

Directions, simple but effective, were given in regard to the disposal of faeces. We find guidance also given as to the burial of the dead, and there is a reference to the washing of a body before burial. Cremation and embalming are also mentioned.

The strictness and definiteness of the laws dealing with leprosy and leprous patients are impressive. It is quite true that other conditions were covered by the term leprosy, though, again, the differential diagnoses with

other diseases are given in the Bible. It is to be remembered also that the factors which probably caused leprosy to be so feared, and so rigorously treated, were the apparently hopeless aspect of the disease from the curative point of view and the seeming inevitableness of the hideous end-results. Though, one notes that recession and even cure of the disease were provided for in the Law.

The lists given in the Levitical Law of the 'clean' and 'unclean' beasts are in accord with what are considered edible and inedible in civilised countries to-day, with the exceptions of the hare and the pig.

The law regarding diverse things not to be mixed; the fruit of fruit trees not to be eaten for the first four years; and the ultra purification of the priests are all noteworthy.

The recognition of the value of good water systems goes far back in Jewish history and practice.

Professor D. M. Blair in his booklet "A Doctor Looks at the Bible" well sums up the contribution of the Mosaic Law to preventive medicine and hygiene:

"The Mosaic Law contains the very first code of preventive medicine. Our modern minds, conscious of the fact that only in our own day has the preventive side of medicine begun to be stressed... are amazed to find in this ancient code a medical section which is entirely preventive in its emphasis. Something of the sort was necessary if the children of Israel, physically weakened by the grinding slavery in Egypt, were to survive the rigours of the wilderness journey and the hygienic difficulties of their close-packed encampments. The efficacy of the elaborate ritual in combating the spread of

'uncleanness', or infection, received a curious recognition many centuries after its inception. During the Middle Ages, Europe was devasated periodically by plague, which spread over whole countries and decimated nations. The Black Death in England was part of such a visitation, which earlier swept through Italy, where the enlightened ruler of one of the Italian States, who noticed that the Jewish community escaped more lightly than others, correctly attributed this to the periods of isolation observed after contact with infected persons or dead bodies, and imposed the Jewish code upon the whole state. In the following century the Venetian quarantine laws were formed, the term 'quarantine', still with us to-day, being derived from the Italian word quaranta, meaning forty, because the Venetians took over from the Mosaic Code one of the longest periods of isolation, that of forty days. It is strange to think that our modern quarantine laws derive their original authority from the thunders of Sinai."

Uncleanness by Touching a Dead Body

The Mosaic Law enacted that anyone who touched the dead body of a person was to be unclean seven days. If a man should die in a tent, then all who entered the tent were to be reckoned unclean for a week. This law also applied to anyone who touched a human bone or a grave. To all such, a clean person was to take a bunch of hyssop and dip it in water and sprinkle the tent, the persons who were there, and the vessels of the tent. This sprinkling with hyssop was to be done on the third and seventh days. Num. chap. 19.

After a battle - as we have seen in the Foreword to this Section - anyone who had slain another was to stay outside the camp seven days and go through the purifying ritual. And their captives had to do the same. The process of purifying was to extend to all articles - clothing or immedi-

menta of any kind which they had with them - and these too had to be thoroughly dealt with according to the minute instructions which were laid down.

In the ordinary way a priest was not to touch a dead body - he must not defile himself in this way. But the Law was relaxed for him in the case of his father, mother, son, daughter, brother, and unmarried sister. Lev. 21:1-4. One notes that there is no specific mention of relaxation of the law on the death of the priest's wife.

It calls for remark that, important as was the town of Tiberias on the Sea of Galilee, there is no mention in the New Testament of Jesus ever entering it. It is believed that this was because Herod Antipas ignored the fact that the site he had chosen was over an ancient cemetery. Devout Jews avoided the place. Jesus kept the Law, yet His compassion moved Him to touch the bier on which lay the dead body of the young man who was being carried through the gate of the city of Nain, thus to all appearance making Himself ceremonially unclean. Luke 7 : 11 - 16.

The law also applied to whoever touched the carcass of a beast in the list of those deemed unclean. It was laid down that he "shall be unclean until the evening, and whosoever beareth ought of the carcass of them shall wash his clothes, and be unclean until the evening." Lev. 11:24&25.

The taboo extended ^{to what} were esteemed clean beasts - if they should die by themselves, or be torn by other beasts - if

anyone touched such an animal he had to wash his clothes and bathe himself in water. The estimation of uncleanness was also to embrace anything the carcass fell upon. A wooden vessel must be put in water until the evening: an earthen vessel was to be broken. If the carcass fell upon an oven or range for pots, these were also to be broken down. A fountain with plenty of water was to be deemed clean; also seed for sowing, but if water was upon the seed the seed was unclean. Leviticus 11th chapter.

Uncleanness after Childbirth

A woman was to be considered unclean for seven days after giving birth to a male child, and unclean for fourteen days after giving birth to a female child. In addition, she was 'to continue in the blood of her purifying' thirty-three days for a male child and twice as long for a female child. The reason for this law lay in the belief that the lochia of the mother lasted longer in the case of a female child. Leviticus 12th chapter.

Uncleanness by an issue in the flesh

A person who had a 'running sore' was flagrantly unclean. In the Foreword to this Section the part quoted shows that the law for a woman with an issue was so worded that there was no loophole. Similar restrictions applied to a man with a 'running issue out of his flesh', but there was an addition in regard to the saddle he rode upon, the uncleanness of the saddle defiled the groom who might carry it. Leviticus 15 : 9 & 10.

As has been said, "There is an extraordinary appreciation of the danger of the spread of infection by contagion - pots and stoves, water vessels, tent, bedding, if exposed to infection, must all be cleansed or destroyed. Most extraordinary of all is the recognition of spitting as a means of spreading disease." The actual citation in regard to spitting reads: "And if he that hath an issue spit upon him that is clean; then he shall wash his clothes, and bathe himself in water, and be unclean until the even." Leviticus 15 : 8.

Uncleanness by Emissions. A man's emission rendered him unclean and he was enjoined to wash himself in water, and wash any garment upon which the emission fell, and be unclean until the evening. If it chanced him by night he must go outside the camp, wash himself as the evening was coming on, and come into the camp again when the sun was set.
Deuter. 23 : 10 & 11.

Excrement. There is a suggestion that something akin to trench latrines was the system in vogue among the Israelites. The simple rule in Deuteronomy 23:12 & 13 - "Thou shalt have a place also without the camp, whither thou shalt go forth abroad: And thou shalt have a paddle upon thy weapon; and it shall be, when thou wilt ease thyself abroad, thou shalt dig therewith, and shalt turn back and cover that which cometh from thee" - if that simple rule was known and acted upon by oriental peoples to-day, it would revolutionise health conditions and be the means of saving countless lives.

Blood was likewise to be covered with dust. Levit. 17 : 13.

Disposal of Dead Bodies

Lack of decent burial was regarded as a calamity by biblical peoples. A man's body being given up to the fowls of the air and the beasts of the field was judged fitting retribution for evil doing. Deuter. 28 : 26.

One is impressed by the instance given in the Book of Ezekiel where a company of men were detailed off for the duty of burying bodies after slaughter on a large battlefield. The method employed of putting up a sign for the guidance of those whose duty it was to inter, and the performance of those duties for a protracted period, are typical of the order of things in various countries after recent wars:

"Seven months shall the house of Israel be burying of them (Gog and his multitude), that they may cleanse the land. Yea, all the people of the land shall bury them... And they shall sever out men of continual employment, passing through the land, to bury with the passengers those that remain on the face of the earth to cleanse it: after the end of seven months shall they search. And the passengers that pass through the land, when any seeth a man's bone, then shall he set up a sign by it, till the buriers have buried it in the valley of Hamon-gog." Ezekiel 39:12 - 15.

Washing of dead body. The practice of washing the dead before burial has a reference in the case of Dorcas who "was sick, and died: ^{when} whom they had washed, they laid in an upper chamber." Acts 9 : 37.

Cremation is mentioned in the Book of Samuel: "All the valiant men arose, and went all night, and took the body

of Saul and the bodies of his sons from the wall of Bethshan, and came to Jabesh, and burnt them there! 1 Sam. 31:12. But we are informed that the bones were not so treated but were buried: "And they took their bones, and buried them under a tree at Jabesh, and fasted seven days." 1 Sam. 31:13. Amos says Moab will suffer punishment "Because he burned the bones of the King of Edom into lime." Amos 2: 1.

Embalming. Joseph had so far embraced Egyptian customs that he "Commanded his servants the physicians to embalm his father: and the physicians embalmed Israel." Gen. 50:2.

Leprosy. As already stated, it is apparent from Bible narratives that leprosy was a much dreaded disease. The 13th and 14th chapters of the Book of Leviticus give full accounts of the diagnosis of leprosy and the measures to be adopted for the protection of the community against those carrying the malady. The responsibility for upholding the laws of public health was vested in the priest. The rule to guide the priest in diagnosis was simple:

"When a man shall have in the skin of his flesh a rising, a scab, or bright spot, and it be in the skin of his flesh like the plague of leprosy: then he shall be brought unto the priest... And the priest shall look on the plague in the skin of the flesh: and when the hair in the plague is turned white, and the plague in sight be deeper than the skin of his flesh, it is a plague of leprosy: and the priest shall look on him and pronounce him unclean." Levit. 13: 2 & 3.

That contagion was suspected to be responsible for the spread of the disease is seen in segregation being

strictly enforced, even in the case of a patient with a suspicion of leprosy. Such a patient was to be shut up seven days and then re-examined. If the disease seemed to be at a stay he was shut up for seven other days. If the diagnosis was at once seen to be positive: "If the rising be white in the skin, and it have turned the hair white, and there be quick raw flesh in the rising... the priest shall pronounce him unclean, and shall not shut him up: for he is unclean." Leviticus 13: 10 & 11.

Differential diagnoses were made between leprosy and boils, tinea tonsurans, psoriasis, and alopecia. Levit. 13:18 - 46.

There must have been moments of great anxiety to the suspected person while the priest was making his examination and coming to his decision, for fear an adverse judgment was pronounced, such as is contained in the words:

"He is a leprous man, he is unclean: the priest shall pronounce him utterly unclean... And the leper in whom the plague is, his clothes shall be rent, and his head bare, he shall put a covering upon his upper lip, and shall cry, Unclean, unclean. All the days wherein the plague shall be in him he shall be defiled; he is unclean: he shall dwell alone: without the camp shall his habitation be." Levit. 13:44-46.

The outcast, however, could appeal if his disease seemed to heal, and it was possible to be pronounced clean again, and be re-admitted to the pleasures of home, friends and normal human life:

"This shall be the law of the leper in the day of his cleansing: He shall be brought unto the priest: And the priest shall go forth out of the camp: and

the priest shall look, and, behold, if the plague of leprosy be healed in the leper...He shall sprinkle upon him that is to be cleansed from the leprosy seven times, and shall pronounce him clean...And he that is to be cleansed shall wash his clothes, and shave off all his hair, and wash himself in water, that he may be clean: and after that he shall come into the camp, and shall tarry abroad out of his tent seven days. But it shall be on the seventh day, that he shall shave all his hair off his head and his beard and his eyebrows, even all his hair he shall shave off: and he shall wash his clothes, also he shall wash his flesh in water, and he shall be clean." Levit. 14:2,3,7-9.

"Leprosy" - Fungus or Mildew - in a garment

The 'leprosy' of garments is thought to have been a fungus or mildew. The Law required that if leprosy appeared in a garment - either in warp or woof - the owner should report to the priest, whether the garment be linen or woollen: and to report also if the condition was seen in skin or in anything made of skin. The suspected garment was shut up by the priest seven days, and if it was found to have spread it was to be judged a 'fretting leprosy' and incineration resorted to. If the condition had not spread after seven days, the priest commanded that the garment be washed, and after other seven days, if the colour was unchanged, it was deemed a 'fret inward', whether it be bare within or without - it must also be burned. If the colour darkened after washing, then the part was to be torn out of the garment, and if the condition appeared still, it was to be burned. If the 'plague' seemed healed the garment was to be washed a second time, and then pronounced clean. Levit. 13:47-59.

"Leprosy" - Mould - in a house

It will be seen from the above law concerning a suspected garment that nothing was left to chance, the treatment must be radical. We find the same thoroughness adumbrated in dealing with a house which appeared to harbour a like condition. In this case it is now believed that the condition was that of a mould with calcium nitrate.

The owner of the suspected house must also report to the priest. The priest first commanded that the house be emptied of its contents, and the house was then shut up seven days if the walls were found to have "hollow strakes, green or reddish, which in sight are lower than the walls." If the condition spread, the stones affected were to be taken out and cast into an unclean place outside the city. But

"If the plague come again, and break out in the house, after that he hath taken away the stones, and after he hath scraped the house, and after it is plastered; then the priest shall come and look, and, behold, if the plague be spread in the house, it is a fretting leprosy in the house: it is unclean. And he shall break down the house, the stones of it, and the timber thereof, and all the mortar of the house; and he shall carry ~~them~~ forth out of the city into an unclean place." Levit. 14:43-45.

Anyone entering the house was to be unclean until the evening. Anyone eating in or lying in the house was required to wash his clothes. If the 'plague' did not spread, the priest sprinkled the house seven times and cleansed the house with the blood of a bird which had been killed in a vessel over running water. Cedar wood, hyssop and scarlet were also employed in the ritual of cleansing.

Leaven. The periodical extermination of leaven was important for the maintenance of a pure food supply: "Unleavened bread shall be eaten seven days; and there shall no leavened bread be seen with thee, neither shall there be leaven seen with thee in all thy quarters." Exod. 13 : 7.

See also Exodus 12 : 19 and Deuter. 16 : 3.

The fires in the Valley of Hinnom probably burned up the refuse of the City of Jerusalem.

Clean and Unclean Beasts. The animals mentioned in Scripture as fit for food and those to be banned make a fairly lengthy list. Animals which fulfil the conditions of 'parting the hoof' - cloven-footed - and 'chewing the cud' (that bringeth up - R.V.) are all regarded as clean. All others unclean (to be detested - Moffat) even though they fulfil the conditions in part. Levit. 11:1-8 and Deuter. 14:3-8.

The measure of immunity from cancer enjoyed by the Jews is held by some to be the result of pork being a forbidden article of dietary.

Fish. All fish with fins and scales to be reckoned clean; all others unclean: "These shall ye eat of all that are in the waters: whatsoever hath fins and scales in the waters, in the seas, and in the rivers, them shall ye eat. And all that have not fins and scales in the seas, and in the rivers, of all that move in the waters, and of any living thing which is in the waters, they shall be an abomination unto you." Levit. 11 : 9 - 12. Also Deuter. 14 : 9.

Fowls. While the animals specifically mentioned as unclean were few - the coney, hare and pig being singled out - the fowls forbidden were listed in greater number, as, for example, the eagle (great vulture - R.V.), ospray, vulture or kite, raven, great and little owl, night hawk (of doubtful meaning), cuckoo (seamew - R.V.), hawk, cormorant, swan, pelican, gier eagle, stork, heron and lapwing (hoopoe - R.V.). The bat is included in this list. Levit. 11:13-19; Deuter. 14:12-19.

Winged creeping things that go on all fours were forbidden, but the following exceptions were made - locust and bald locust, the beetle, grasshopper and all after their kind.
Levit. 11 : 22.

One of the most feared invasions in many parts of the world is a plague of locusts. While Africans have no desire for a locust invasion, they loved the locust as an article of food. To the inhabitants of Bechuanaland - and to Africans in general - it is a heinous offence for a stranger to help himself to another's food without permission, but if there was a dish of locusts, custom permitted the stranger to stretch forth his hand and eat.

Creeping things. The following were specially designated as forbidden: the weasel, mouse, tortoise, ferret or gecko -R.V., chameleon, lizard, snail and mole. Levit. 11 : 29 & 30.
Most of these are eaten in primitive Africa.

Also forbidden as food were "whatsoever goeth upon the

belly, whatsoever goeth upon all four, or whatsoever hath more feet among all creeping things." Levit. 11 : 42.

There was also a law against eating "whatsoever goeth upon his paws." Leviticus 11 : 27.

How tenaciously an orthodox Jew will preserve the keeping of these listed prohibitions is seen when Peter, given in a dream a heavenly command to eat some of the forbidden items, replied with his accustomed forthrightness, "Not so, Lord; for I have never eaten anything common or unclean." Acts 10:13-15.

Slaughter of Animals. Laymen could kill animals under certain rules - Levit. 17:3 & 4 - but the Jewish Rabbi was, and is to-day, the appointed butcher for his people. He is responsible for the killing of the animals and for the inspection of the meat supply.

The eating of fat and blood was expressly forbidden: "Whatsoever man there be of the children of Israel, or of the strangers that sojourn among you, which hunteth or catcheth any beast or fowl that may be eaten; he shall even pour out the blood thereof, and cover it with dust...Ye shall eat the blood of no manner of flesh." Lev. 17 : 13. "Ye shall eat no manner of fat, of ox, or of sheep, or of goat. And the fat of the beast that dieth of itself, and the fat of that which is torn with beasts, may be in any other use; but ye shall not eat of it." Levit. 7:23 & 24.

The embargo on the eating of blood was an important sanitary precaution, since we know there is no vehicle

equal to blood for the carrying of microbes and parasites, and no ridus so suitable for the multiplication of many vectors of disease. As in the case of excrement - another suitable element for the growth of germs - blood on the ground was to be covered with earth or dust.

Various other Laws

Diverse things. That the Law aimed at a sense of the fitness of things is shown by the injunction to avoid attempting to mingle that which were diverse: "Thou shalt not let thy cattle gender with a diverse kind: thou shalt not sow thy field with mingled seed: neither shall a garment mingled of linen and woollen come upon thee." Lev. 19 : 19. It is believed that the prohibition against a garment of mixed material was because such a garment is not so easily cleansed.

Law of Fruit Trees. The fruit of a tree was not to be eaten for the first four years. The fruit of the first three years was to be discarded, the fruit of the fourth year was to be offered to God. Levit. 19:23-25. Every seventh year the people were to let their fields lie fallow, and refrain from pruning or gathering the grapes of their vineyard. Lev. 25:3.

Priests and Levites and Cleansing. The priests and Levites were required to preserve strict personal hygiene among themselves, and to keep the Temple thoroughly clean: "Take the Levites from among the children of Israel, and cleanse them. And thus shalt thou do unto them, to cleanse them:

sprinkle water of purifying upon them, and let them shave all their flesh, and let them wash their clothes, and so make themselves clean." Numbers 8 : 6 & 7.

"The priests went into the inner part of the house of the Lord, to cleanse it, and brought out all the uncleanness that they found in the temple of the Lord into the court of the house of the Lord. And the Levites took it, to carry it out abroad into the brook Kidron." 2 Chron. 29:16.

Water and Water Systems. The digging of wells has been a labour of men from earliest biblical times. See Gen. 26:18. Many Scripture passages speak of wells, pools, springs, rivers and seas. The foregoing pages prove how numerous were the occasions for the use of water for cleansing purposes.

One of the good deeds recorded of King Hezekiah was that he "made a pool, and a conduit, and brought water into the city" of Jerusalem. 2 Kings 20:20.

Even Pilate is remembered for a work of this kind, and part of his aqueduct remains to-day; though he raised a storm by meeting the cost out of the temple treasury.

Then we have the famous Pools of Solomon, near which he planted gardens and orchards. Eccles. 2:4 - 6. H. V. Morton tells of an underground spring to reach which one had to descend twenty-six stairs into the cool darkness. And he remarks, "In this ancient covered well one realises how Solomon in his superb love-song likens his spouse to a

sealed fountain. (Song of Solomon 4:12)...The garden enclosed, or the fountain sealed, to prevent the soiling or theft of the precious liquid, was a perfect image of purity." (H. V. Morton's "In the Steps of the Master" page 130).

To provide an abundant water supply to Jerusalem is one of the present-day tasks to which the Israeli Government has given priority.

The Book of Proverbs advises a plentiful water supply and praises its benefits: "Drink water out of thine own cistern, and running waters out of thine own well. Let thy fountains be dispersed abroad, and rivers of waters in the streets."
Proverbs 5 : 15 & 16.

The frequent ceremonial washings required by the Mosaic Law doubtless influenced Jews to build synagogues near rivers and lakes.

MATERIA MEDICA AND THERAPEUTICS

"Take thou also unto thee principal spices, of pure myrrh, sweet cinnamon, sweet calamus, cassia, and oil olive; And thou shalt make an oil of holy ointment, an ointment compound after the art of the apothecary: it shall be an holy anointing oil..." Exodus 30:23-25

"Take unto thee sweet spices, stacte, onycha, and galbanum; these sweet spices with pure frankincense...and thou shalt make it a perfume, a confection after the art of the apothecary, tempered together... And as for the perfume that thou shalt make, ye shall make it to yourselves according to the composition thereof: it shall be unto thee holy for the Lord." Exodus 30:34-38.

"One went into the field to gather herbs, and found a wild vine, and gathered thereof wild gourds his lapfull, and came and shed them into the pot of pottage: for they knew them not. So they poured out for the men to eat: and it came to pass, as they were eating of the pottage, that they cried out, and said, O thou man of God, there is death in the pot. And they could not eat thereof. But he said, Then bring meal: and he cast it into the pot; and he said, Pour out for the people, that they may eat. And there was no harm in the pot." 2 Kings 4:39-41.

MATERIA MEDICA AND THERAPEUTICS

The Pharmacopœia of the Jews was a somewhat simple and restricted one, but the work of the apothecary or pharmacist is specifically referred to in the Bible.

The reference to the Art of the Apothecary and the description given in the Book of Exodus about the preparation of the ointment to be employed in the Temple Ceremonial includes so many ingredients that it borders on polypharmacy. Ointments for medicinal and other purposes were in common use.

Oil - most frequently olive oil - is also mentioned, and its uses were varied - from irrigation to internal medication.

The strengthening properties of carbohydrates, in the form of honey, is given in one striking instance.

Pharmaceutical substances such as mint, anise, cummin were well known. Mustard had its usual vogue as a condiment; and garlic was known as a flavouring agent.

Mandrakes were believed to possess aphrodisiac qualities.

Common salt was highly esteemed and was used in all sacrificial offerings, and, as we saw in the Section on Midwifery, was highly thought of for its beneficial effects when applied to the skin of a child.

Nitre was recognised as a remover of fatty secretions from the skin, and soap - sometimes under the name of fuller's soap - has a number of references, being known for its cleansing and whitening properties.

The application of a plaster of figs was prescribed by the Prophet Isaiah for a boil which afflicted King Hezekiah.

Many Jewish and Egyptian remedies were items of diet.

Hydrotherapy was known; music was employed therapeutically; animal heat was resorted to as an aid to comfort and to extend life.

Poisons and antidotes have more than one vivid picture in Bible pages.

The employment of alcohol as a narcotic and also as a gastric sedative was known.

Oil and wine were helpful in soothing and protecting wounds. In fact there is in Scripture not only an early reference to anaesthesia, but also to anti-sepsis.

The astonishing thing about the Pharmacopoeia found in the Bible is that there is an entire absence of filth therapy or the bringing in of various extraordinary, not to say repellent, items which we find in practically all early medical histories of peoples. The Bible remedies are mostly simple homely remedies which, in many instances, are still in vogue to-day in our own and other lands. And, in addition, there are foreshadowings of the modern treatments of Western Lands.

Ointments. As already stated, the apothecary's art is referred to in Scripture and there is one reference, though of a figurative nature, to the use of mortar and pestle: "Though thou shouldst bray a fool in a mortar among wheat with a pestle, yet will not his foolishness depart from him." Proverbs 27 : 22.

The use of sandals was associated with measures for the care of the feet: and it was an accepted custom to provide facilities for washing the feet after a journey. These facilities were protective and might be judged as falling into the category of preventive medicine, for the application of ointment after washing was a common practice and allayed the irritation caused by dust and heat, and later concealed the odour of perspiration. A guest was not only helped by such attention, he was also honoured. Hence the significance of the act of the woman mentioned in the seventh chapter of the Gospel according to Luke where it states: "And, behold, a woman... when she knew that Jesus sat at meat in the Pharisee's house, brought an alabaster box of ointment, And stood at his feet behind him weeping, and began to wash his feet with tears, and did wipe them with the hairs of her head, and kissed his feet, and anointed them with the ointment." Luke 7 : 37 & 38.

Again, ointments, perfumes and spices gave much pleasure to those who used them and to others in contact. Boxes of perfume were carried by women at their girdles. Perfumes

were put on garments and in boxes, and on beds and couches. Sometimes frankincense was chewed to give the breath a sweet smell. The Song of Solomon contains vivid accounts of the pleasure derived from the employment of perfumes, ointments, powders and spices:

"Because of the savour of thy ointments thy name is
an ointment poured forth. 1 : 3.

While the king sitteth at his table, my spikenard
sendeth forth the smell thereof. 1 : 12.

Who is this that cometh...perfumed with myrrh and
frankincense, with all the powders of the merchants?
3 : 6.

Camphire, with spikenard...and saffron; calamus
and cinnamon, with all the trees of frankincense;
myrrh and aloes, with all the chief spices."
4 : 13 & 14.

My hands dropped with myrrh and my fingers with
sweet smelling myrrh, upon the handles of the locks."
5 : 5.

One of the aphorisms which we are told the men of
Hezekiah copied out from the Proverbs of Solomon runs:

"Ointments and perfumes rejoice the heart." Proverbs 27:9.

The ointment which had lost its normal sweet-smelling
properties was, however, accounted good for nothing. The
note of contempt runs through the words: "Dead flies
cause the ointment of the apothecary to send forth a
stinking savour." Ecclesiastes 10 : 1.

Ointments used at the Burial of the Dead

That the custom of anointing the dead was an old one is
borne out by the statement concerning King Asa who died
about 940 B.C.: "They buried him in his own sepulchres,

which he had made for himself in the city of David, and laid him in the bed which was filled with sweet odours and divers kinds of spices prepared by the apothecary's art." 2 Chronicles 16 : 14.

Just before the Passover Feast at the time of Jesus death a woman came with a box of ointment and we are told she broke the box - it is believed that this implied simply breaking the seal of the box - and poured the contents of the box on the head of Jesus. When some murmured at waste, Jesus said, "Let her alone...she is come aforehand to anoint my body to the burying." Mark 14 : 1 - 8.

In connection with the actual burial of Jesus all three Evangelists remark on the employment of ointments and spices in the anointing of the Lord's body:

"And they (the women) returned, and prepared spices and ointments...Upon the first day of the week, very early in the morning, they came unto the sepulchre, bringing the spices which they had prepared." Luke 23:56 and 24:1.

"Joseph of Arimathea...besought Pilate that he might take away the body of Jesus...And there came also Nicodemus...and brought a mixture of myrrh and aloes, about an hundred pound weight." John 19 : 38 & 39.

"And when the Sabbath was past, Mary Magdalene, and Mary the mother of James, and Salome, had bought sweet spices, that they might come and anoint him." Mark 16 : 1.

Oil. Scripture references to oil almost invariably indicate olive oil. In the Book of Esther - 2:12 - oil of myrrh is specially mentioned.

Oil was employed for external application - "to make his (man's) face to shine" Psalm 104:15. Also in the act

of the consecration of the high priest - "And he poured of the anointing oil upon Aaron's head, and anointed him, to sanctify him." Levit. 8 : 12. Priests used oil in setting apart and anointing kings - e.g., 1 Sam. 16:13 - hence this anointing has its part in the Coronation Ceremonies of our own monarchs.

Oil was a part of the meat offering burned on the altar - Levit. 6:15 - and it was extensively employed as an illuminant not only in the homes of the people, but also in the House of God: "Thou shalt command the children of Israel, that they bring thee pure oil olive beaten for the light, to cause the lamp to burn always." Exodus 27 : 20.

Oil was also used as a food, for we find the widow of Zarephath was supported in time of famine by cakes made with oil and meal. 1 Kings 17 : 8 - 16.

Oil was in the ointments used for various purposes, including the ritual of burial.

While we are not told of Jesus using oil in the healing of the sick, it can be deduced that Jesus approved of oil being employed in certain cases, for when He sent out twelve on a missionary campaign we are told that they not only preached that men should repent, but also that they "anointed with oil many that were sick, and healed them." Mark 6 : 13.

There is also a direct medical reference to the use of oil, even an instruction to employ oil, found in the Epistle of James, where that most practical of all the apostles wrote: "Is any sick among you? let him call for the elders

of the church; and let them pray over him, anointing him with oil in the name of the Lord. And the prayer of faith shall save the sick, and the Lord shall raise him up." James 5 : 14 & 15.

In our own day there is consideration being given to the subject of the gift of healing which was a feature of the ministry of the Early Church. In this connection there is a movement for the doctor and minister to work more together, and in both professions there are those welcoming this collaboration.

Various medicinal substances. In Bible lands and times various substances were in use for medicines and allied purposes. Jesus referred to Mint, Anise and Cummin. Matt. 23:23. Mint was employed as an aromatic. Anise had the property of allaying griping pains; it was also used as a carminative, and an infusion made from it was beneficial as a wash for indolent ulcers. Cummin, as also hysson, was a carminative. In addition cummin was applied to circumcision wounds. Mustard - Matt. 13:31 - had its vogue as a condiment, and Garlic - Numbers 11:5 - was a flavouring agent.

The Balm of Gilead is referred to and it was evidently held in high esteem: "Is there no balm in Gilead? is there no physician there? why then is not the health of the daughter of my people recovered?" Jeremiah 8:22. In Jeremiah 51:8 the action of the balm of Gilead seems to be a local sedative. Carbohydrates. The strengthening properties of carbohydrates

was illustrated by the refreshment which came to Jonathan when he ate the honeycomb as he passed to battle: "wherefore he (Jonathan) put forth the end of the rod that was in his hand, and dipped it in an honeycomb, and put his hand to his mouth; and his eyes were enlightened." 1 Sam. 14:27.

Mandrakes were considered to be a stimulant of sexual desire. Hence the reference in Genesis 30:14 & 15. The Revised Version of the Bible speaks of mandrake fruit as 'love apples'. Caper-berry in Ecclesiastes 12:5 - R.V. - is substituted for the word 'desire', meaning that the erotic stimulant of even the caper-berry shall fail.

The Ideal State might be visualised in the attractive picture prophesied in the Book of Ezekiel where it states: "By the river upon the bank thereof... shall grow all trees... and the fruit thereof shall be for meat and the leaf thereof for medicine." Ezekiel 47 : 12.

Narcotics : Alcohol and derivatives. Wine was employed as a narcotic. It was given to those about to be executed on account of the Talmudic interpretation of the advice tendered in the Book of Proverbs: "Give strong drink unto him that is ready to perish, and wine unto those that be of heavy hearts." Proverbs 31 : 6. See also Alcohol in chapter of Medicine, pages 22 and 23.

At the Crucifixion of Jesus the offer of an agent to deaden pain was declined: "They gave him wine to drink

mingled with gall: and when he had tasted thereof, he would not drink." Matt. 27:34. "They gave him to drink wine mingled with myrrh: but he received it not." Mark 15:23.

"In Jerusalem a society of charitable women provided a merciful drug for those about to be crucified. It was administered just before the victim, stretched on the ground, was nailed to the cross-beam...It is believed that the potion offered by these women was a mixture of wine and drugs, including frankincense, laudanum, myrrh, resin, saffron and mastich." "Steps of the Master, by H.V. Morton, pages 371-2.

It might reasonably be held that Jesus declined any narcotic that would dull His senses and render His brain less clear. Otherwise we would probably not have had His seven great sayings from the Cross.

Paul's advice to Timothy to use wine as a gastric sedative has already been referred to - page 22.

Salt has always been highly esteemed by the Jews and other peoples: "Every oblation of thy meat offering shalt thou season with salt; neither shalt thou suffer the salt of the covenant of thy God to be lacking from thy meat offering: with all thine offerings thou shalt offer salt." Lev. 2:13.

We are told that all the covenants God made with the children of Israel in connection with the heave offerings were covenants of salt. Numbers 18:19. Even the giving of the kingdom to David and his sons was by a covenant of salt. 2 Chron. 13:5.

Elisha's action, and the manner of it, in sweetening the water supply of the city of Jericho is worthy of a quotation in full:

"And the men of the city said unto Elisha, Behold, I pray thee, the situation of the city is pleasant, as my lord seeth: but the water is naught, and the ground barren. And he said, Bring me a new cruse, and put salt therein; and they brought it to him. And he went forth unto the spring of the waters, and cast the salt in there, and said, Thus saith the Lord, I have healed these waters; there shall not be from thence any more death or barren land. So the waters were healed unto this day, according to the saying of Elisha which he spake."

2 Kings 2 : 19 - 22.

Christ's arresting statement "Ye are the salt of the earth: but if the salt have lost his savour, wherewith shall it be salted? it is thenceforth good for nothing, but to be cast out, and to be trodden under foot of men."

- Matt. 5:13 - called forth recently an interesting explanation, brought to my notice, that the Lord is alluding to the custom of storing rock salt in the temple for use in religious ceremonies. This salt in its natural state was mixed with clay or sand, and was reddish brown in colour. Being exposed to the air the salt gradually deteriorated until it became unfit for inclusion in the sacred ceremonies. It was then removed from the temple and thrown on the roads and pathways.

Reference may again be made to the beneficial effects of the application of salt to the skin of the body. See Section on Midwifery - page 56.

Soap. Nitre removed fatty secretions from the skin. The soap referred to in Scripture was probably a vegetable alkali - nitre boiled with olive oil. "Though thou wash thee with nitre, and take thee much soap, yet thine iniquity is marked." Jeremiah 2 : 22.

The Prophet Malachi likened the coming of the Messiah to a refiner's fire and added, "He is like fuller's soap." Malachi 3:2.

The raiment of Jesus at the Transfiguration was described as "white as snow; so as no fuller on earth can white them." Mark 9 : 3.

Additional Therapeutics.

Hydrotherapy. In the sphere of therapeutics we find frequent mention of hydrotherapy. The sick and lame seem habitually to have gathered round pools. Naaman was told to go and wash. 2 Kings 5:10. Jesus tendered the same advice to the man at the Pool of Siloam. John 9 : 7.

Sulphur was present in the hot springs of Palestine - e.g. near the city of Tiberias.

Plaster of Figs. The application of a plaster of figs was prescribed for the boil which afflicted King Hezekiah: "Isaiah had said, Let them take a lump of figs, and lay it for a plaster upon the boil, and he shall recover." Isaiah 38:21.

Dietetics. It has been said that with the Egyptians and the Jews most remedies were dietary, e.g. meal, milk, vinegar, wine, figs, raisins, honey, etc.

Music as a therapeutic agent. It has been mentioned already that King's Saul's periodic fits of mania lifted temporarily under David's musical ministrations:

"And Saul's servants said unto him, Behold now, an evil spirit from God troubleth thee, Let our Lord now command thy servants, which are before thee, to seek out a man, who is a cunning player on the harp: and it shall come to pass...that he shall play with his hand, and thou shalt be well ...And it came to pass...that David took an harp, and played with his hand: so Saul was refreshed, and was well, and the evil spirit departed from him."
1 Samuel 16:14-23.

Animal Heat. In ancient times additional comfort and, it is claimed, added length of life was obtained to kings and other important people by radiation of heat and the inbreathing of the exhalations of young girls or women while lying with them. In the light of present-day morals such an arrangement as was made in the last days of King David would be looked at askance, even though it could be said that he "was old and stricken in years: and they covered him with clothes, but he gat no heat." 1 Kings 1:1&2. Revivifying was also resorted to by Elijah and Elisha in the cases of children, but, as already suggested, their actions imply the employment of artificial respiration and not simply the conveyance of bodily heat. And the results are connected with answers to their prayers.
1 Kings 17: 17 - 24; 2 Kings 4:18 - 37.

Poison and Antidote. A vivid story of poisoning and recovery by the application of an antidote is quoted in the Foreword to this Section. A. MacAlister in Hastings

"Dictionary of the Bible" gives the following explanation of the mistake that was made: "Apparently the globe cucumber - cucumis prophetarum - a common plant about Samaria, was sometimes used to thicken it (pottage);...One of the sons of the prophets mistook probably the violently purgative citrullus colocythis for this plant."

Dr. W. M. Thomson in his "The Land and the Book" has a note as follows:

"The Hebrew root seems to point to some herb that bursts and splits open, and I have thought it might be the Elaterium, which is found all over the country, looks like a young squash, and is extremely poisonous. When green, it might be mistaken for an edible 'gourd' or cucumber."

The promise of Christ to His disciples of immunity from hurt if they drank any deadly thing - Mark 16:18 - recalls the use of the poison bean in Calabar. This bean - Physostigma venenosum - has its place in modern pharmacy as it is the source of physostigmine much used in ophthalmic work. In Calabar it was used in poison ordeals. One who was suspected of having 'bewitched' another, or of having brought evil on a community, was made to drink a concoction of the bean. If he survived he was declared innocent, but proof of guilt was proclaimed if death ensued.

P A T H O L O G Y

"Who soever he be...that hath a blemish,
 let him not approach to offer the bread
 of his God: For whatsoever man he be
 that hath a blemish, he shall not appr-
 oach; a blind man, or a lame, or he that
 hath a flat nose, or anything superflous,
 Or a man that is broken-footed, or broken
 -handed, or crook-backt, or a dwarf, or
 that hath a blemish in his eye, or be
 scurvy, or scabbed, or that hath his
 stones broken: No man that hath a blemish
 of the seed of Aaron the priest shall come
 right to offer the offerings of the Lord."

Leviticus 21 : 17 - 21.

"Her Nazarites were purer than snow, they
 were whiter than milk, they were more
 ruddy in body than rubies...
 Their visage is blacker than a coal...
 their skin cleaveth to their bones; it
 is withered, it is become like a stick
 ...these pine away, stricken through for
 want of the fruits of the field."

Lamentations 4 : 7 - 9.

"Asa in the thirty and ninth year of his
 reign was diseased in his feet, until
 his disease was exceeding great."

2 Chronicles 16 : 12.

P A T H O L O G Y

In this Section on Pathology one cannot avoid touching on various forms of clinical pathology and morbid anatomy already described under Medicine and Surgery.

Dissection of a Dead Body

The pathological material in the Bible suffers in amount from the Jewish aversion to post-mortem investigations. The nearest we read to a systematic dissection of a cadaver for the purpose of emphasising the cause of death is the act of a certain Levite whose concubine had been outraged:

"When he was come into his house, he took a knife, laid hold on his concubine, and divided her together with her bones (limb for limb - R.V.), into twelve pieces, and sent her into all the coasts of Israel. And it was so, that all who saw it said, there was no such deed done nor seen from the day that the children of Israel came out of the land of Egypt unto this day: consider of it, take advice, and speak your minds." Judges 19 : 29 & 30.

Embalming is twice mentioned in the Bible, and naturally these instances have an Egyptian setting when Jacob and Joseph died in that country which could boast a certain amount of progress in things medical. Genesis 50:2, 3 & 26. The process of embalming, as practised in Egypt, occupied from forty to seventy days: "And Joseph commanded his servants the physicians to embalm his father: and the physicians embalmed Israel. And forty days were fulfilled for him; for so are fulfilled the days of those which are embalmed: and the Egyptians mourned for him three score and

ten days." It is said that the Egyptians treated the bodies of their dead by immersing them in a strong solution of salt for as long as seventy days before passing them to the embalmer. Doubtless if the tombs in the Cave of Machpelah - mentioned as the burial place of the patriarchs in Genesis 23:19, 35:29, 49:30 and 50:12 - in the City of Hebron, making it a holy place, and which tombs are said to have been examined, sealed and clamped down with iron bands by the Crusaders; were these tombs again opened it might be found that the embalming of Joseph and Jacob had been done by the Egyptians with their usual skill and competence.

One reads with surprise of the knowledge and intelligence of simple Africans in removing the heart of Dr. Livingstone from his body and burying that heart under a tree, then removing the organs and drying the body in the sun, and finally carrying it a thousand miles to the Coast and handing it over to the British Authorities. That it was without doubt the body of the great missionary traveller was confirmed by the pathological condition of the humerus of the left arm, where the lion had crushed the bone.

Decomposition of the Body. Job is usually graphic in his language and we find him so in his descriptions of the decomposition of the human body: "I have said to corruption, Thou art my father; to the worm, Thou art my mother, and my sister. Job 17:14. "They shall lie down in the dust, and the worms shall cover them." Job 21:26. "The

worm shall feed sweetly on him." Job 24:20.

General Pathological Conditions. It was laid down in the Levitical Law that no beast with a blemish, e.g. "Blind, or broken, or maimed, or having a wen, or scurvy, or scabbed" was to be offered in sacrifice. But, as we see from the Foreword of this Section, the prohibitions went further, for it was enjoined that only healthy normal persons were to be allowed into the priesthood. See page 29.

Diseases of the Circulatory System. It has been surmised that King Asa suffered in old age from senile gangrene - though the possibility of gout cannot be excluded altogether - since the record runs: "In the time of his old age he was diseased in his feet." 1 Kings 15:23. The quotation regarding Asa in the Foreword to this Section has led some to make merry over a piece of fine irony in the juxtaposition of the verses describing Asa's case, for despite the fact that "his disease was exceeding great" it is added - "Yet in his disease he sought not to the Lord, but to the physicians. And Asa slept with his fathers." 2 Chron. 16:12&13.

Nabal's heart would have made an interesting pathological specimen, on account of his habits and the heart's condition leading to his death. The surmise that a stroke of apoplexy carried him off at the end is probably correct. For details already given see pages 24 and 25.

The heart rupture of Jesus - see also pages 25 and 26 -

may well have been due to the excruciating agony of His sufferings, combined with the supreme refinement of His nature.

The varicose ulcers of Lazarus, which the dogs licked, have already been noted on page 45.

Diseases of the Alimentary System. The disease of King Jehoram is described as an incurable sickness of the bowels, so much so that "in process of time, after the end of two years, his bowels fell out by reason of his sickness." 2 Chron. 21 : 18 & 19.

The sickness of the father of Publius whom Paul cured - Acts 28:8 - was dysentery. In both the above we have references which can be said to include the passing of blood and mucus; and the denuding of the Bowel and prolapsus ani could be included in the case of King Jehoram.

Herod's miserable end - supervening so quickly on his being hailed as a god - has been attributed to a perforation of the bowel by a worm or worms. Acts 12:23.

Diseases of the Generative or Reproductive System.

It is impossible to state the precise disease or the particular part of the generative system affected in the woman who suffered from an issue of blood for twelve years - Matt. 9:20 - but the narrative suggests a chronic metritis. Uterine fibroids has also been given as the diagnosis in this woman's case.

Diseases of the Nervous System. Doubtless the two cases of infantile paralysis cited on page 17, showed the typical signs of atrophy of the limbs. This is distinctly included in the statement that the hand of the first was 'withered'.
Luke 6 : 6 - 10.

Again the atrophic state is mentioned in the record of Jeroboam's affliction when "his hand, which he put forth against him (the man of God) dried up, so that he could not pull it in again." 1 Kings 13 : 4.

Wasting paralysis also seems postulated when Zechariah speaks of "Their flesh shall consume away while they stand upon their feet, and their eyes shall consume away in their holes (sockets - R.V.), and their tongue shall consume away in their mouth." Zechariah 14 : 12.

Diseases of the Cutaneous System. The manifestations of Psoriasis have been described on page 76; and the differential diagnosis of Tinea Tonsurans and Leprosy on page 74. Ulcerative sepsis is bemoaned by Isaiah in the words: "From the sole of the foot even to the head there is no soundness in it; but wounds and bruises and putrifying sores." And he adds the lament that no healing measures have been applied, since the wounds and bruises and putrifying sores "have not been closed, neither bound up, neither mollified with ointment." Isaiah 1 : 6.

The prophet also predicted that pride would be brought low by the infliction of a pathological skin condition,

for, "the Lord will smite with a scab the crown of the head of the daughters of Zion." Isaiah 3 : 17.

Jeremiah in his Lamentations vividly portrays the pathological signs of famine, and in a later chapter of the same book describes the morbid anatomy which arises from extremely lowered vitality, as seen in the quotation given in the Foreword to this Section, and which finds its culmination in the words "Our skin was black like an oven because of the terrible famine." Lamentations 5 : 10.

Specific Diseases with Skin Manifestations. The clinical and pathological signs of leprosy are often mentioned: Miriam - Numbers 12:10; Gehazi - 2 Kings 5:27; and Uzziah - 2 Chron. 26:19 - all give us pictures of the early appearance of the disease. Different was the case of the man whom Jesus met and whose leprous tissue was in an advanced state, since he was "a man full of leprosy." Luke 5 : 12.

There is no mistaking that enlarged glands and inflamed inguinal regions, characteristic of plague, are referred to when the men of Ashdod are said to have had "emeralds in the secret parts." 1 Samuel 5 : 9.

The exacerbations of Job's disease - Yaws or Oriental Sore - have already been detailed on pages 15 & 16; and the skin eruptions of small-pox on pages 17 and 18.

The gummata of syphilis might be inferred from the assertion in the Book of Job concerning the wicked man "His bones are full of the sin of his youth, which lie down with him in the dust." Job 20:11. It has long been

claimed that syphilis was brought to Europe by the sailors of Columbus. Contrary to this view Dr. Louis P. Bosman in an article in the "South African Medical Journal" of 9th October, 1937, wrote:

"It is surprising that scholars fritter away valuable time in trying to trace the origin of syphilis. Some trace the origin to France, some to America, but none seem to heed the description of it in the Bible. We have "saddle sores" described in Lev. 21:18. Is not Lev. 12 an apt description of a macerated foetus - a congenital luetic?"

Dr. Bosman also held that in Leviticus 13th chapter we have evidence that "The health officer attempted to differentiate between syphilis with its maculo-papular eruptions, its numerous patches and punched-out ulcerations and the benign eczemas and herpes." Bosman also claimed that the Book of Numbers chapters 25 and 31 contain descriptions of epidemics of syphilis.

One hesitates to go the whole way with Dr. Bosman, since he renders Leviticus 26:17 in the following way: "Ye will be vanquished by the invisible foe (germs)", and thus he brings in Pathology's kindred subject of Bacteriology.

One might be more justified in reading microbes into the Psalmist's statement about "the pestilence that walketh in darkness, and the destruction that wasteth at noonday."

Psalm 91 : 6.

Diseases of the Bones and Joints. The outstanding case of this kind is that of the woman with kyphosis, who "was bowed together, and could in no wise lift up herself."

Luke 13 : 11.

Fractures. It is to be presumed that Abimelech's - Judges 9:53; Goliath's - 1 Sam. 17:50; and Siserah's - Judges 4:16-22 - fractures of the skull, and Eli's - 1 Sam. 4:18 fracture of the neck were obvious after death. These, and Mehibosheth's - 2 Sam. 4:4 - deformity of the feet from injury, come under surgical pathology.

It is a matter of conjecture what particular condition - old fracture or otherwise - the writer of the Book of Proverbs had in his mind's eye when he wrote: "The legs of the lame are not equal" (hang loose - R.V.).
Proverbs 26 : 7.

A N A T O M Y

"The hand of the Lord was upon me, and carried me out in the Spirit of the Lord, and set me down in the midst of the valley which was full of bones, And caused me to pass by them round about: and, behold, there were very many in the open valley; and, lo, they were very dry. And he said unto me, Son of man, can these bones live? And I answered, O Lord God, thou knowest. Again he said unto me, Prophecy upon these bones, and say unto them, O ye dry bones, hear the word of the Lord. Thus saith the Lord God unto these bones, Behold I will cause breath to enter into you, and ye shall live: And I will lay sinews upon you, and will bring up flesh upon you, and cover you with skin, and put breath in you, and ye shall live. So I prophesied as I was commanded: and as I prophesied, there was a noise, and behold a shaking, and the bones came together, bone to his bone. And when I beheld, lo, the sinews and the flesh came up upon them, and the skin covered them above: but there was no breath in them.

Then said he unto me, Prophecy unto the wind, prophecy, son of man, and say to the wind, Thus saith the Lord God; Come from the four winds, O breath, and breathe upon these slain, that they may live. So I prophesied, as he commanded me, and the breath came into them, and they lived, and stood up upon their feet, an exceeding great army."
Ezekiel 37 : 1 - 10.

"Thou hast covered me in my mother's womb. I will praise thee; for I am fearfully and wonderfully made: marvellous are thy works; and that my soul knoweth right well. My substance was not hid from thee, when I was made in secret, and curiously wrought in the lowest parts of the earth. Thine eyes did see my substance, yet being unperfect; and in thy book all my members were written, which in continuance were fashioned, when as yet there was none of them." Psalm 139:14-16.

A N A T O M Y

Despite the somewhat lengthy quotation from the Book of Ezekiel which comprises most of the Foreword of this Section, and which has been described as the Anatomist's Chapter, the Jews in biblical times did not advance far in the knowledge of human anatomy. This was doubtless largely due to the strict injunctions in the Mosaic Code against touching dead bodies. Though we have proofs that the evidence of disease was noted in the bodies of the dead, it would have been considered sacrilegious to probe further by dissecting cadavers to follow up the evidence and bring the matter to a logical conclusion by seeking to formulate the precise sickness from which the deceased person died. The prohibitory law gave added force to the drama carried through to its gruesome end by the incensed Levite, as cited in the previous chapter - page 132.

Despite the embargo above mentioned, references are found in many parts of the Bible to the structure of the human body. The priests quite evidently gained a knowledge of the component parts of the animals sacrificed in connection with the Temple Ceremonials.

Words of Micah can be imagined as applicable to modern students of anatomy: "I said, Hear...who pluck off their skin from off them, and their flesh from off their bones, ...and chop them in pieces"! Micah 3: 1 - 3.

... Habakkuk also has a striking anatomical phrase: "Thou woundest the head...discovering the foundation unto the neck." Habakkuk 3 : 13.

To the Christian student, as well as to others, it is significant that the wounds of Jesus were inflicted in all four parts into which the body is divided in modern days for purposes of study and dissection - Head, Thorax, Upper and Lower Extremities.

Embryology. From the embryological point of view the attention is arrested on reading the verses from the 139th Psalm which forms the second part of the Foreword to this Section of Anatomy. In addition, there are two other striking references to embryology in two other Books of the Old Testament: "As thou knowest not what is the way of the spirit, nor how the bones do grow in the womb of her that is with child; even so thou knowest not the works of God who maketh all." Ecclesiastes 11 : 5.

One would give much to have the detailed workings of Job's mind which led him to add his quota to embryological literature:

"Thine hands have made me, and fashioned me together round about; yet thou dost destroy me. Remember, I beseech thee, that thou hast made me as clay; and wilt thou bring me into the dust again?
Hast thou not poured me out as milk, and curdled me like cheese?
Thou hast clothed me with skin and flesh, and hast fenced me with bones and sinews."
Job 10 : 8 - 11.

"While there is nothing in the Bible in line with a study of the Science of Osteology, we know there was a special reverence for bones on the part of the Hebrew people. Moab was condemned "because he burned the bones of the king of Edom into lime." Amos 2 : 1.

Though King David was ruthless in regard to the seven sons of Saul's daughters and took steps to see that they were liquidated, still, it is recorded that he had their bones, and the bones of King Saul himself and those of Jonathan, buried in the grave of Saul's father - Kish.
2 Samuel 21 : 13 & 14.

King Josiah showed little reverence for the bones of those whom he considered guilty of Israel's direst sin - idolatry - for he had those bones burned on the profane altar. But while he in the act of having those same bones taken out of their graves, he spied another grave and asked, "What title (monument - R.V.) is that that I see? And the men of the city told him, It is the sepulchre of the man of God... And he said, Let him alone; let no man move his bones. So they let his bones alone." 2 Kings 23:17.
See also 1 Kings 13 : 2.

Morphology and Physique. Gigantism is frequently referred to in the Old Testament. The best example is that given by the timid spies regarding the land of Canaan and its inhabitants as they saw them: "The people that we saw in it are men of great stature. And there we saw giants, the sons of Anak, which come of the giants (Nephilim R.V.):

and we were in our own sight as grasshoppers, and so we were in their sight." Numbers 13 : 32 & 33.

In the Song of Solomon are given companion pictures of the faultless male form and the beauty of the perfect female figure:

MALE

"My beloved is white and ruddy, the chiefest among ten thousand.
His head is as the most fine gold; his locks are bushy, and black as a raven.
His eyes are as the eyes of doves by the rivers of waters, washed with milk, and fitly set:
His cheeks are as a bed of spices, as sweet flowers; his lips like lilies, dropping sweet-smelling myrrh.
His hands are as gold rings set with the beryl; his belly is as bright ivory overlaid with sapphires:
His legs are as pillars of marble set upon sockets of fine gold; his countenance is as Lebanon, excellent as the cedars:
His mouth is most sweet; yea, he is altogether lovely. This is my beloved, and this is my friend, O daughters of Jerusalem."

Song of Solomon 5:10-16.

FEMALE

"How beautiful are thy feet with shoes, O prince's daughter! the joints of thy thighs are like jewels, the work of the hands of a cunning workman:
Thy navel is like a round goblet, which wanteth not liquor: thy belly is like a heap of wheat set about with lilies.
Thy two breasts are like two young roes that are twins.
Thy neck is as a tower of ivory; thine eyes like the fish-pools in Heshbon, by the gate of Bath-rabbim: thy nose is as the tower of Lebanon which looketh toward Damascus.
Thine head upon thee is like Carmel, and the hair of thine head like purple: the king is held in the galleries.
How fair and how pleasant art thou, O love, for delights!
This thy stature is like to a palm tree, and thy breasts to a cluster of grapes.
I said, I will go up to the palm tree. I will take hold of the boughs thereof: now also thy breasts shall be as clusters of the vine, and the smell of thy nose like apples:
And the roof of thy mouth like the best wine for my beloved, that goeth down sweetly, causing the lips of those that are asleep to speak."

Song of Solomon 7 : 1 - 9.

Absalom's perfect proportions did not escape notice and comment: "In all Israel there was none to be so much praised as Absalom for his beauty: from the sole of his foot to the crown of his head there was no blemish in him. And when he polled his head, (for it was at every year's end that he polled it; because the hair was heavy on him, therefore he polled it:) he weighed the hair of his head at two hundred shekels after the king's weight." 2 Sam. 14: 25 & 26.

The equivalent weight of hair in avoirdupois is said to be six and a quarter pounds.

General and Figurative. The Mosaic Law, as we have seen, was directed against a person with any deformity or superfluity holding the priestly office. Doubtless this emphasized towards note being taken, such as: "There was...in Gath...a man of great stature, that had on every hand six fingers, and on every foot six toes, twenty four in number; he also was born to the giant." 2 Samuel 21: 20.

The apex of the heart, under the fifth rib, and fatal consequences following a piercing of this region, seem to have been well understood: "Abner with the hinder end of the spear smote him (Asahel) under the fifth rib, and the spear came out behind; and he fell down there." " Sam. 2: 23.

Attention might be drawn to S. Paul's anatomical lists in his Epistle to the Romans - 3:13-18 - and also in his Epistle to the Corinthians = 1st Corinthians 7: 13 - 18.

S. John also enumerates anatomical parts in Rev. 1:13-17.

EXAMPLES OF ANATOMICAL TERMS EMPLOYED IN BIBLE

UPPER EXTREMITY

Shoulder Blade	Job	31:22
Shoulder.....	Job	31:22
Arm.....	2 Sam.	1:10
Palms of hand	Dan.	10:10
Hand.....	Exodus	13: 9
Thumb.....	Exodus	29:20
Fingers.....	2 Sam.	21:20

LOWER EXTREMITY

Buttocks.....	2 Sam.	10: 4
Thigh.....	Gen.	32:25
Legs.....	Prov.	26: 7
Knees.....	Job	3:12
Foot.....	Exod.	29:20
Ankle Bones....	Acts	3: 7
Heels.....	Job	18: 9
Soles of Feet..	Josh.	3:13
Great Toe.....	Exod.	29:20
Toes.....	1Chron.	20: 6

THORAX AND ABDOMEN

Ribs.....	Gen.	2:21
Breasts.....	Job	3:12
Tears.....	Ezek.	23: 3
Paps = Breasts - R.V.	Ezek.	23:21
Caul of Heart Pericardium	Hos.	13: 8
Heart.....	2Kings	9:24
Back.....	Psalms	21:12
Side.....	Psalms	91: 7
Loins.....	Exod.	28:42
Belly.....	Job	3:11
Bowels.....	2Chron.	21:15
Reins = Kidneys...	Psalms	7:9
Liver.....	Psalms	7:23
Navel.....	Prov.	3: 8
Womb.....	Gen.	29:31
Foreskin....	Gen.	17:11
Stones = Testicles.	Deut.	23:1.

EXAMPLES OF ANATOMICAL TERMS EMPLOYED IN BIBLE

HEAD AND NECK

Head.....	Job	1:20
Neck.....	1 Sam.	4:18
Skull.....	Judges	9:53
Face.....	Job	23:17
Temples.....	S. of S.	4: 3
Forehead.....	Ezek.	3: 8
Eyes.....	Gen.	48:10
Apple of Eye..	Deut.	32:10
Eyelids.....	Psa.	132: 4
Ear.....	Exod.	21: 6
Nbse.....	Prov.	30:33
Nbstrils.....	Gen.	2: 7
Mouth.....	Exod.	13: 9
Roof of Mouth.	Job	29:10
Tongue.....	Job	5:21
Lips.....	Psalm	63: 5
Teeth.....	Job	19:20
Cheek.....	Job	16:10
Jaws.....	Job	29:17
Cheek Bone....	Psalm	3: 7
Throat.....	Psalm	5: 9
Beard.....	Psalm	133: 2

GENERAL

Sinew.....	Genesis	32:32
Bones.....	Genesis	2:23
Nails.....	Deuter.	21:12
Flesh.....	Deuter.	32:42
Blood.....	Deuter.	32:42
Skin.....	Job	10:11
Hair.....	2 Sam.	14:26
Fat.....	Psalm	17:10
Joints.....	Coloss.	2:19
Marrow.....	Job	21:24
Body.....	1 Cor.	6:19

The following is a list of the
 names of the persons who
 were present at the meeting
 held on the 1st day of
 the month of January, 1900.
 The names are given in
 alphabetical order.

P H Y S I O L O G Y

The following is a list of the
 names of the persons who
 were present at the meeting
 held on the 1st day of
 the month of January, 1900.
 The names are given in
 alphabetical order.

"Then said Daniel to Melzar...
 Prove thy servants, I beseech thee ten days; and let them give us pulse to eat, and water to drink. Then let our countenances be looked upon before thee, and the countenance of the children that eat the portion of the king's meat; and as thou seest, deal with thy servants. So he consented to them in this matter, and proved them ten days. And at the end of ten days their countenances appeared fairer and fatter in flesh than all the children which did eat the portion of the king's meat. Thus Melzar took away the portion of their meat, and the wine that they should drink, and gave them pulse."

Daniel 1: 11 - 16.

"The body is not one member, but many. If the foot shall say, Because I am not the hand, I am not of the body; is it therefore not of the body? And if the ear shall say, Because I am not the eye, I am not of the body, is it therefore not of the body? If the whole body were an eye, where were the hearing? if the whole body were hearing, where were the smelling? But now hath God set the members every one of them in the body, as it hath pleased him. And if they were all one member, where were the body? But now are they many members, yet but one body. And the eye cannot say unto the hand, I have no need of thee; nor again the head to the feet, I have no need of you... That there should be no schism in the body; but that the members should have the same care one for another. And whether one member suffer, all the members suffer with it."

1 Corinthians 12:14-26.

P H Y S I O L O G Y

Human Physiology has a place in Bible literature though the references often have to be sought out. In many instances physiological processes have as companions items connected with psychology and anatomy.

The three Bible writers who contribute most physiological references are Job, Solomon and the Apostle Paul. As already indicated, Paul's dissertations, which might be termed spiritualised physiology, are impressive, and they were doubtless the result of his close companionship with that fine exponent of the Greek Medical School - the physician Luke.

Apart from the quotations from the books of the three writers already mentioned, there are many references to physiological processes scattered throughout the Bible.

If it is accepted that man has an immortal soul, and is thus different from the beasts that perish, the deduction may be made that we have at the very beginning of the Book of Genesis the explanation of the immortality in the words: "The Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life, and man became a living soul." Genesis 2 : 7.

Allied with that assertion we have a statement reiterated again and again that the life is in the blood. One wonders if research will yet unfold that this simple word holds within it the explanation of the baffling question

as to the seat and secret of life's source?

The various physiological functions of different parts of the body are often mentioned, and the place of the five senses - sight, hearing, taste, touch and smell - in the body economy are touched upon. The acts of blushing, sighing, weeping, laughing; the showing of fear and anger, as well as other expressions of emotion all have places in Bible pages. Also the reflexes brought into play by such acts as walking, running, swimming, swallowing are mentioned, and even flatulence is noted.

The influence of alcohol in causing a man to shout and stagger, as well as giving him a sense of general well-being, and even its narcotic effects, are set forth.

In the Foreword to this Section we have a good example of S. Paul building up a case for cohesion in the Church from the fact that the physical body is co-ordinated and that the health of the body is dependent on all parts being in a healthy state and all working in harmony for the good of all. In fact S. Paul, in that far-off time, emphasises a main thesis of Modern Medicine. S. Paul has similar references in his Epistle to the Romans, and in each of the first three chapters of his Letter to the Colossians.

The first part of this Section's Foreword proved that Daniel early grasped the benefits of simple living, particularly in the matter of dietary.

In the First Book of Kings - chapter one, verse five - there is a reference to the ambitious young man Adonijah,

who aspired to be king and who, towards the attainment of his desire, prepared himself chariots and horsemen, and fifty men to run before him. Dr. Snowman, in his interesting "Short History of Talmudic Medicine," draws attention to a remarkable Talmudic comment on the runners of Adonijah. In the Talmud it is stated that their swiftness was due partially to the removal of their spleens. Dr. Snowman adds: "There was evidently an ancient belief that the spleen was a handicap to running, the idea is also mentioned by Pliny. This reference can hardly be regarded as evidence that splenectomy was an operation which was actually practised; it is probably a theoretical assumption on the part of the Rabbis, based on popular belief."

The Master Tissues: 1. Muscle

We are reminded that swimming is largely a muscular exercise by the remark: "He that swimmeth spreadeth forth his hands." Isaiah 25:11. The full benefit of heat generation by involuntary muscle^{action} did not escape mention by the writer of the Book of Ecclesiastes: "If two lie together, then there is heat: but how can one be warm alone? 4:11. We have already drawn attention to the curious application of this fact in the efforts taken to warm King David when he was old and frail. Page 128.

Two other paragraphs tell of the fatigue of muscles: "And it came to pass, when Moses held up his hand, that Israel prevailed;...But Moses hands were heavy: and they

took a stone, and put it under him, and he sat thereon; and Aaron and Hur stayed up his hands, the one on the one side, and the other on the other side; and his hands were steady." Exodus 17: 11 & 12.

"He (Dodo) arose, and smote the Philistines until his hand was weary, and his hand clave unto the sword,"
2 Samuel 23:10.

The Book of Judges - chapters 14 to 16 - details at length the outstanding muscular exploits of Samson.

The Master Tissues: 2. Nerve

In this division will be found references to the Five Senses. Other results of nervous action will be found in later pages when we cite combinations of the physiological and the psychological.

The Fives Senses: 1. Sight

When one considers the amazing mechanism of the eye and the measures taken for its protection - the eyeball placed in a sort of cave; the eyebrows to carry off any perspiration which may be contaminated; the eyelids quick to close at the approach of a foreign body; the eyelashes acting as a protective screen; the tear gland exuding moisture to keep the cornea and conjunctiva moist, and yet able to 'increase the waters' when necessary; the tear-duct carrying into the nose the moisture that passes over the eye; the iris with its lens-like aperture regulating the amount of light allowed to strike on the delicate

nerve plexus at the back of the eye: the lens to focus the rays thereon - when one considers all these, one appreciates the statement in the Book of Proverbs, "The seeing eye the Lord hath made." Proverbs 20:12. Also one feels how appropriate it is to liken an over-ruling Providence, as Moses did to Israel, to one who "Kept him as the apple of his eye." Deuter. 32:10.

2. Hearing. Also when one considers the anatomy and the physiology of the ear, with its trumpet-like pinna and auditory entrance shaped to gather the incoming sounds; the drum, protected by being placed at the inner end of a winding passage, to take the oscillations in the atmosphere and transfer them through the perfectly fitting malleus, incus and stapes to the fine nerve centres and sounding chambers within, then one accents the words in the Book of Proverbs, "The hearing ear...the Lord hath made." Proverbs 20:12.

3. Touch. The nervous structures connected with the sense of touch are, as we know, also very intricate, but they do not lend to pictorial descriptions as do the eye and ear. But there are interesting references in St. Luke's writings to our 'light palpation' and our 'deep palpation'. Luke uses a word medically implying light touch when he reports the statement of Jesus, "Be unto you also, ye lawyers! for ye lade men with burdens grievous to be borne, and ye yourselves touch not the burdens with one of your

fingers." Luke 11 : 46.

The second term which S. Luke employs and which corresponds to 'deep palpation' is when he quotes the commendation of Jesus, "Give, and it shall be given unto you: good measure, pressed down, shaken together, and running over. Luke 6 : 38.

4. Taste. Job has more than one reference to the sense of taste. When he asks, "Doth not the ear try words?" he adds, "and the mouth taste his meat?" Job 12 : 11. He also asks, "Can that which is unsavoury be eaten without salt? or is there any taste in the white of an egg,"
Job 6 : 6.

He evidently knew the function of the taste-buds in the mouth, though we cannot claim that he could have pointed them out anatomically.

5. Smell. Curiously the Prophet Jeremiah couples together the two most primitive senses which are so closely related - taste and smell. He refers rather contemptuously to Moab's feeling of safety in the retreat of his mountain fastnesses: "Moab hath been at ease from his youth, and he hath settled on his lees, and hath not been emptied from vessel to vessel, neither hath he gone into captivity: therefore his taste remained in him, and his scient is not charged." Jeremiah 48 : 11.

The Psalmist speaks of the Lord's anointed as one whose

garments smell of myrrh, and aloes and cassia. Psalm 45:8.

The deception of Jacob in pretending to be his brother was so successful that Isaac was certain he was blessing his son who loved the chase, so much so that he exclaimed, "See, the smell of my son is as the smell of a field which the Lord hath blessed." Genesis 27 : 27.

The Digestive Function. In a Book that has a fair amount about feasts and the pleasures of the table, it is noteworthy to find commendation of plain fare, such as we find in the first quotation in the Foreword to this Section of Physiology. One can well understand Vegetarians delighting in Daniel's stand, and the stated benefits which were derived therefrom, and feeling that a Daniel had indeed come to judgment for the discomfiting of the eaters of flesh!

The writer of the Epistle to the Hebrews enters the domain of physiology, in the employment of a metaphor regarding digestion, when he says: "Strong meat (solid food - R.V.) belongeth to them that are of full age (for full grown men - R.V.), even those who by reason of use have their senses exercised to discern both good and evil." Hebrews 5 : 14.

With regard to the peace offerings of the temple it was expressly stated that the breast of the animals was to be the portion of the priest and his sons. Leviticus 7 : 31. It is interesting to compare this custom with that of a

primitive people such as the B. echuana. Dr. Livingstone, in his first book of Travels, remarks that "Sechele (chief of the Bakwena tribe) had by right of chieftainship the breast of every animal slaughtered either at home or abroad."

In the matter of dietetics Livingstone also throws light on John the Baptist's eating of locusts and wild honey. Livingstone remarks, "There is a physiological reason why locusts and honey should be eaten together: the laxative properties of the last correct the astringent qualities of the first." Travels and Researches in South Africa - page 31

That the Jews knew something of dietetics and cooking can be inferred from the fact that the meat offering was to be baked in the oven and dressed in the pan (baking pan-R.V.) And the sacrifice of thanksgiving was to be offered with unleavened cakes mingled with oil, cakes of fine flour, fried (soaked - R.V.). See Leviticus - chapter seven.

The prophet Samuel, reviewing the disadvantages of monarchy, went out of his way to warn the people that a king "will take your daughters to be confectionaries, and to be cooks, and to be bakers." 1 Samuel 8 : 13.

The reflex of swallowing has at least two references: "Yea, they shall drink, and they shall swallow down." Obad. 16. How long wilt thou not depart from me (look away from me - R.V.) nor let me alone till I swallow down my spittle." Job 7 : 19.

The baneful effects of hunger are shown when "Saul fell

straightway all along on the earth...and there was no strength in him: for he had eaten no bread all that day, nor all the night." 1 Samuel 28 : 20.

A like condition is described in Isaiah: "They shall pass through it (the land) hardly bestead and hungry: and it shall come to pass, that, when they shall be hungry, they shall fret themselves, and curse their king and their God." Isaiah 8 : 21.

Thirst has a pathetic reference when we are told that in the famine "The tongue of the sucking child cleaveth to the roof of his mouth for thirst." Lamentations 4 : 4.

Pigmentation of the skin seems, even in far off biblical times, to have betokened inferiority, since the bride in the Song of Solomon defends herself with the remark, "I am black but comely." Song of Songs 1:5. It has been alleged that the use of the conjunction 'but' is an instance of the superiority-complex on the part of European translators, and a Negro translation in the United States renders the passage, "I am black and comely." But the complex of inferiority seems to reassert itself, for she adds in the next verse, "Look not upon me, because I am black (swarthy - R.V.), because the sun has looked upon me (scorched me - R.V.). Song of Solomon 1 : 5 & 6.

Secretion of Milk. Lactation and weaning have already been cited. See Midwifery, pages 56 and 57. Job has a word about "Breasts full of milk" - Job 21:24 - but the Revised Version of the Bible substitutes 'milk pails' for 'breasts'.

Excretion of Sweat has an early reference in Scripture:

"In the sweat of thy face shalt thou eat bread." Gen. 3:19.
We have a reference to Jesus, under severe emotional stress in the Garden of Gethsemane, sweating blood. Luke 22:44.

In the ordinances of the priests, given in the Book of Ezekiel, there is a prohibition stating "They shall not gird themselves with anything that causeth sweat." Ezek. 44:18.

Men Left-handed. There are curious citations in the Book of Judges to men who were left-handed. The first instance is that when the people of Israel were in sore straits a deliverer was raised for them "in Ehud the son of Gera, a Benjamite, a man left-handed." Judges 3:15.

A second reference is still more striking: "Among all this people there were seven hundred chosen men left-handed: every one could sling stones at an hair-breadth, and not miss!"
Judges 20:16.

Physiological Expressions of Emotion

The part emotion plays in physical well-being is apparent in such statements as: "A man's wisdom maketh his face to shine." Eccles. 8:1. "A merry heart doeth good like medicine (is a good medicine - R.V.)." Proverbs 17:22. "A good report maketh the bones fat." Proverbs 15:30

Joy. A note of joy runs through Scripture such as we find among the Israelites when the foundations of the restored Temple were laid: "Many of the priests and Levites, and chief of the fathers, who were ancient men, that had seen the first house, when the foundation of this house was

laid before their eyes, wept with a loud voice; and many shouted aloud for joy." Ezra 3 : 12.

Moses must have had experiences of ecstasy when "Moses wist not that the skin of his face shone while he talked with him (God)...And the children of Israel saw the face of Moses, that the skin of Moses face shone." Exod. 34: 29&35.

Weeping. Jeremiah and his Lamentations are usually associated with physiological expressions of grief - see Lament. 3:48 & 49 - but Jeremiah is by no means the only biblical exponent of this form of emotion. The Psalmist deplures, "I am weary of my crying; my throat is dried: mine eyes fail." Psalm 69:3. A strong man though King David was, he on more than one occasion sought relief in this way, for we are told: "David and the people that were with him lifted up their voice and wept, until they had no more power to weep." 1 Sam. 30:4.

The Bible's shortest verse is of two words - "Jesus went". John 11:35.

Fear and Trembling. The Book of Job is always vivid in language but never more so than when it describes the fear generated in Eliphaz by what appears to have been a nightmare: "In thoughts from the visions of the night, when deep sleep falleth on men. Fear came upon me, and trembling, which made all my bones to shake. Then a spirit passed before my face; the hair of my flesh stood up: It stood still, but I could not discern the form thereof: an image was before mine eyes: there was silence, and I heard a voice, saying, Shall mortal man be more just than God?"

shall a man be more pure than his Maker?" Job 4:17-17.

It needs little imagination to picture the emotional state of the woman with the issue of blood, when she was made conscious that Jesus knew that virtue had gone out of Him to her: "The woman fearing and trembling...fell down before him." Mark 5 : 33.

Anger. One of the unutterably sad things about Scripture records is how good men were at the mercy of capricious desots, whose dispositions showed little principle, and yet who could end the lives of fellowmen, e.g., Jesus and John the Baptist in the hands of a Pilate and a Herod. Typical of many such statements is: "Asa was wroth with the seer, and put him in the prison house; for he was in a rage with him." 2 Chron. 16:10.

Another example is that of the anger of Jezebel, king Ahab's wife, when she heard of Elijah's giving short shrift to the prophets of Baal: One can almost hear the hiss of the words from between her teeth: "So let the gods do to me, and more also, if I make not thy life as the life of one of them by to-morrow about this time." 1 Kings 19:2.

Laughter can be of more than one kind. We see derisive laughter in the Psalmist's complaint: "All they that see me laugh me to scorn: they shoot out the lip, they shake the head." Psalm 22:7. Another example of this kind of laughter is in the picture of men setting themselves up against God: "He that sitteth in the heavens shall laugh

the Lord shall have them in derision." Psalm 2 : 4.

That healthy, normal laughter has a place in life is borne out by the Preacher's statement: "There is a season, and a time...to laugh." Ecclesiastes 3 : 1 & 4.

Clapping hands; hissing. Job says that the fate of the wicked man will be that "Men shall clap their hands at him, and shall hiss him out of his place." Job 27 : 23.

Blushing. Ezra evidently knew shamefacedness when he gave vent to the cry: "O God, I am ashamed and blush to lift up my face to thee." Ezra 9 : 6.

Sleep and Dreams. In Scripture there are numerous references to sleep. Solomon gives a thumb-nail sketch of the inert man in the words: "I went by the field of the slothful...And, lo, it was all grown over with thorns, and nettles had covered the face thereof, and the stone wall thereof was broken down. Then I saw, and considered it well; I looked upon it, and received instruction. Yet a little sleep, a little slumber, a little folding of the hands to sleep: So shall thy poverty come as one that travelleth; and thy want as an armed man." Prov. 24: 30-34.

Though Solomon condemned the lazy man who allowed sleep to overcome him, he extolled the benefit and attractiveness of healthy sleep which comes as a result of hard work, when he penned the memorable phrase: "The sleep of a labouring man is sweet, whether he eat little or much." Eccles. 5 : 12.

Dreams. Dreams play a definite part and are regarded in Bible records of much greater importance than present-day estimation accords them, though we would probably agree with the Preacher's declaration when he said, " a dream cometh through the multitude of business." Eccles. 5:3.

Daniel speaks - like Eliphaz the Temanite to whose nightmare we referred on pages 161 and 162 - of the visions of his head which troubled him, though dreams were not all loss in his opinion, for he writes: "Then was the secret revealed to Daniel in the night vision." Daniel 2:19.

Certainly we are given to understand in Scripture that dreams were in certain instances the vehicle of Divine guidance and instruction.

The end of all our physiological processes will be found in what Mrs. Browning has described as one of the finest verses in the Bible: "He giveth his beloved sleep" - Psalm 127:2 - that is if we lean to the old accepted meaning of the words as including the sleep of death, instead of the marginal rendering of the Revised Version: "He giveth unto his beloved in sleep." Psalm 127:2.

THE BASIC SCIENCES

BOTANY

ZOOLOGY

CHEMISTRY

PHYSICS

The Bible's contribution to the Basic Sciences is worthy of our consideration, though mostly the references are general, topical and non-technical.

B O T A N Y

"Consider the lilies of the field, how they grow; they toil not, neither do they spin: And yet I say unto you, That even Solomon in all his glory was not arrayed like one of these."

Matt. 6 : 28 & 29.

"A sower went forth to sow; And when he sowed, some seeds fell by the wayside, and the fowls came and devoured them up: Some fell upon stony places, where they had not much earth; and forthwith they sprung up, because they had no deepness of earth: And when the sun was up, they were scorched; and because they had no root, they withered away: And some fell among thorns; and the thorns sprung up and choked them: But others fell into good ground, and brought forth fruit, some an hundred-fold, some sixty-fold, some thirty-fold."

Matt. 13 : 3 - 8.

"There is hope of a tree, if it be cut down, that it will sprout again, and that the tender branch thereof will not cease. Though the root thereof wax old in the earth, and though the stock thereof die in the ground; Yet through the scent of water it will bud, and bring forth boughs like a plant."

Job 14: 7 - 9.

B O T A N Y

As might be expected from writers belonging to a pastoral people, there are many references to the Vegetable Kingdom in the Bible. The references, however, are mostly general, and are not set forth according to the modes of modern science. Proof that the writers thought in general, rather than in particular, terms is seen in the names given being largely the names of genera, not of species.

Much of the employment of botanical terms in the pages of Scripture was for the inculcation of spiritual or moral truth. For example, Solomon in his teaching "Spake of trees, from the cedar tree that is in Lebanon even unto the hysson that springeth out of the wall." 1 Kings 4:33. In the Foreword to this Section we have Christ's appraisal of the anatomical beauty of the lily surpassing that of the apparel of Solomon. Thomas Carlyle in one of his lectures on "Heroes and Hero Worship" describes that statement of Jesus as a look into the deepest deeps.

A favourite simile of the Sweet Singers of Israel was that of the righteous man growing and flourishing like a healthy tree by rivers of water, while the wicked were as the chaff - only fit to be scattered or burned. One has only to glance at the first Psalm to see this well illustrated.

Man dying is likened to the withering of grass.

In the department of the physiology of plant life we have emphasis on the importance of water, the burrowing of roots, the principles of grafting and transplantation, and the transmission of seeds by water and animals. Job gave a realistic picture of plant physiology in the passage we cull from his Book in the Foreword to this Section.

The baneful effects of wind, scorching sun, insects, caterpillars, parasitic fungi, and the barking of trees all find places in Bible pages.

The Levitical Law is the basis of much of the husbandry of to-day, e.g., the one year in seven to be a fallow year; diverse seeds not to be sown in the same field. One wishes that the law of gleaning, in consideration for the poor, was still in vogue in European and other countries.

Plants as food in the form of cereals, fruits and vegetables are duly noted, and we close this Section on Botany by listing most of those given.

How great a subject the Botany of the Bible can be made can be seen in the learned volume, which is really a detailed scientific treatise, "The Plants of the Bible" by H. N. and A. L. Moldenke.

- Creation. One cannot but appreciate the sublime yet simple language of the first and second chapters of the Book of Genesis in the descriptions which are given of the origin of plant life:

"God said, Let the earth bring forth grass, the herb yielding seed, the fruit tree yielding fruit after his kind, whose seed is in itself, upon the earth: and it was so. And the earth brought forth grass, and the herb yielding seed after his kind, and the tree yielding fruit, whose seed was in itself, after his kind: and God saw that it was good."

Genesis 1 : 11 & 12.

It has been averred that the description of Creation in the second chapter of Genesis contradicts that which is given in the first chapter. The words are not contradictory but supplementary.

One's attention is arrested by the words in Gen. 2:10 - "And a river went out of Eden to water the garden." In South Africa it was significant to find that Africans knew nothing of watering gardens by making furrows till the early missionaries taught them. One of the earliest furrows in South Africa - that near the Lovedale Missionary Institution - is still giving its beneficent results though it was made over a century ago.

Anatomy and Physiology of Plants

It does not require a close study of the New Testament to see that in one sense ^{Paul} was very different from his Master. Paul loved the cities, whereas Jesus kept close to Nature and evidently loved quiet country places. In

fact we have no record of Jesus spending a night, except perforce his last, within a walled city during the years of His ministry. Paul draws his illustrations mostly from men's occupations and recreations, such as the Roman soldier and his parody and the Greek athlete contesting in the Olympic Games. Jesus on the other hand draws His illustrations in large part from the fields, trees, fruit and flowers. As one has written:

"He talked of grass and wind and rain,
 And fig-trees and fair weather;
 And made it his delight to bring
 Heaven and earth together.
 He spoke of lilies, vines and corn,
 The sparrow and the raven,
 And words so natural, yet so wise,
 Were on men's hearts engraven."

Jesus used well known natural phenomena to impress lessons He particularly wished to be remembered. An example of this is found in the statement repeated with very little alteration in all the Gospels of Matthew, Mark and Luke, viz., "When his (the fig tree) branch is yet tender, and putteth forth leaves, ye know that summer is nigh:"
 Matt. 24 : 32.

Add to the foregoing Christ's pregnant simile about His own death: "Except a corn of wheat fall into the ground and die, it abideth alone: but if it die it bringeth forth much fruit." John 12 : 24.

Can we find anywhere the physiology of plant growth stated in so few words as when Jesus said:
 is
 "So the kingdom of God, as if a man should cast

seed into the ground; And should sleep, and rise night and day, and the seed should spring and grow up, he knoweth not how. For the earth bringeth forth fruit of herself; first the blade, then the ear, after that the full corn in the ear. But when the fruit is brought forth, immediately he putteth in the sickle, because the harvest is come." Mark 4 : 26 - 29.

It would hardly be expected that the Book of Job holds complementary sentiments with the Epistle to the Hebrews and use plant life as the vehicle for stating them, yet in the former we have "Can the rush grow up without mire? can the flag grow without water? While it is yet in his greenness, and not cut down, it withereth before any other herb." Job 8:11 & 12. To this the latter book gives the corollary: "The earth which drinketh in the rain that cometh oft upon it, and bringeth forth herbs meet for them by whom it is dressed." Hebrews 6 : 7.

The citation in the Foreword to this Section shows how Job pondered on the processes of the Vegetable Kingdom and expressed his cogitations in fitting words. There is also his statement: "Roots are wrapped about the heap, and seeth the place of stones." Job 8 : 17.

Despite what has been said in a previous paragraph, the Apostle Paul was not barren of botanical illustrations in his teaching, for he gives a striking description of the principle of plant grafting:

"If some of the branches be broken off, and thou, being a wild olive tree, were grafted in among them, and with them partakest of the root and fatness of the olive tree; Boast not against the

branches...thou bearest not the root, but the root thee. Thou wilt say then, The branches were broken off, that I might be grafted in...If God spared not the natural branches, take heed lest he also spare not thee...God is able to graff them in again. For if thou wert cut out of the olive tree which is wild by nature, and wert grafted contrary to nature into a good olive tree; how much more shall these, which be the natural branches, be grafted into their own olive tree!"

Romans 11:17-24.

The Prophet Ezekiel uses many metaphors and similes in his Book, but perhaps the most arresting is that in which he pictures God as a Forester whose heart is set on transplantation:

"Thus saith the Lord God; I will also take of the highest branch of the high cedar, and will set it; I will crop off from the top of his young twigs a tender one, and will plant it upon a high mountain and eminent...and it shall bring forth boughs, and bear fruit, and be a goodly cedar: and under it shall dwell all fowl of every wing; in the shadow of the branches shall they dwell."

Ezekiel 17 ; 22 & 23.

Diseases of Plant Life

Adverse climatic conditions. Though not by any means confined to tropical and sub-tropical regions, adverse climatic conditions in such areas do play a larger part in reducing the harvest of the fruits of the earth than in more temperate climates.

We are told that in the dream Pharaoh related to Joseph he saw seven ears of corn come up on one stalk, and they were rark and good. But after them came up seven thin ears blasted by the east wind. Genesis 41:5 & 6.

The Apostle James likens the fate of the worldly rich man to the flower of grass which cannot stand the sun beating down upon it: "For the sun is no sooner risen with a burning heat, but it withereth the grass, and the flower thereof falleth, and the grace of the fashion of it perisheth: so shall also the rich man fade away in his ways." James 1 : 11.

Ezekiel gives a picture of a land which, having been planted by the transmission of seeds by animals and water, is blasted by the east wind which caused it to wither. Ezekiel 17 : 3 - 10.

The Psalmist adds his evidence of the effect of adverse climatic conditions when he speaks of vines being destroyed by hail and sycamore trees by frost. Psalm 78 : 47.

Adverse conditions in the soil. Jesus gave a picture of seed sown in soil which had no depth, and also of seed sown in soil which already harboured the seed of thorns. See Foreword to this Section.

Insect Pests. The greatest damage recorded in Bible pages, however, seems to have been done by agents which are still formidable foes, viz., worms, locusts and other insect pests. In the Book of Deuteronomy the people are told they will carry much seed into the fields, but they will gather in little, "for the locust shall consume it." Deut. 28: 38. The Book of Kings + 1 Kings 8: 37 - tells of a locust and caterpillar invasion, and the Book of Psalms - 103: 33-35 - speaks of the same agents smiting vines and fig trees

and eating up all the herbs in the land and devouring the fruit of the ground.

Worms also played a destructive part, for the people of Israel were told they would plant vineyards, and dress them, but they would "neither drink of the wine nor gather the grapes: for the worms shall eat them." Deuter. 28:39.

Jonah made a booth outside the City of Nineveh, and sat under it to shelter from the scorching sun. And a gourd grew up and made a shadow over his head, and it is added that Jonah was exceeding glad of the gourd. But the next day a worm smote the gourd so that it withered. Jonah 4:5-11.

There are references also to pestilence, blasting and mildew as companions together. 1 Kings 8 : 37.

Conditions of famine are portrayed by the Prophet Habakkuk when he speaks of the fig tree not blossoming, neither fruit in the vine, and the labour of the olive failing, and fields yielding no meat. Habakkuk 3 : 17 & 18.

It was not stated precisely what was the cause that though the people had olive trees in all their coasts, they would not have oil to anoint themselves with, "For this olive shall cast his fruit." Deuter. 28 : 40.

It is also not laid down exactly why the Prophet Jeremiah saw one "basket which had very naughty figs which could not be eaten, they were so bad." Jeremiah 24 : 1 - 3.

The Prophet Joel speaks of an enemy who has laid his vine waste and barked his fig tree, after the palmer worm,

locust, canker worm and catemillar had devoured the fruit trees of the land. Jerl 1 : 4 - 7.

Divine Laws regarding Plant Life. Moses was insistent that God had given him laws to be observed respecting the manner of treating fields, the eating of fruit from young fruit trees, provision from the fields for the help of the poor and the stranger, and the preservation of fruit trees even when besieging a city.

Diverse seeds were not to be sown in the same field, "lest the fruit of thy seed which thou hast sown, and the fruit of thy vineyard be defiled." Deuter. 22 : 9.

A fallow year. The fields were to be sown for six successive years, but in the seventh year there was to be no sowing, but the land was to "rest and lie still". Exod. 23:10 & 11.
See also Leviticus 25:2-5.

Jubilee year. The fiftieth year was to be an extra year in which the ground was to lie fallow; there was to be no sowing of the fields and any fruit which grew of itself was not to be gathered. Leviticus 25 : 11 - 22.

Fruit from very young trees was not to be gathered for purposes of eating during the first three years of their yielding; in the fourth year the fruit was to be an offering to God; in the fifth year the fruit could be eaten.
Levit. 19 : 23 - 25.

The Law of Gleaning was a most humane law. The corners of fields were not to be wholly reaped, neither were the

people to gather the gleanings of the harvest field, nor were they to glean their vines. The gleanings were to be left for the poor and the stranger. Levit. 19:9 & 10. See also Levit. 23:22 and Deuter. 24:19-21.

Preservation of fruit trees. One of the most striking laws of the Levitical Code is that in regard to the temptation to cut down the fruit trees around a city which was being besieged. Ordinarily one would imagine that the destruction of the trees, or cutting them down for use in offensive action, would be judged permissible. But the Mosaic Law laid it down that fruit trees were not to be so treated, but were to be preserved at all costs:

"When thou shalt besiege a city a long time, in making war against it to take it, thou shalt not destroy the trees thereof by forcing an ax against them: for thou mayest eat of them, and thou shalt not cut them down (for the tree of the field is man's life,) to employ them in the siege: Only the trees which thou knowest that they be not trees for meat, thou shalt destroy and cut them down." Deuter. 20:19 & 20.

Plants as Food Factors. From the first pages of the Bible plants and their fruits and roots are given as sources of food supplies. In the first chapter of Genesis we are told God said, "Behold, I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in the which is the fruit of a tree yielding seed: to you it shall be for meat." Genesis 1:29.

We are informed that Jacob sold pottage and gave Esau

-bread and pottage of lentiles. Genesis 25 : 29 -34.

Isaac sowed successfully for he reaped in a certain year an hundredfold. Genesis 26:12.

Noah was an husbandman but he succumbed to the temptation to imbibe too freely of the wine of his vineyard, for we are told he "was drunken." Genesis 9 : 20 & 21.

The Children of Israel in their desert wanderings looked back longingly to the fruitful products of Egyptian soil for they said: "We remember...we did eat in Egypt freely the cucumbers, and the melons, and the leeks, and the onions, and the garlick." Numbers 11:5. Though, in time, they did appreciate that their Promised Land was a good land when they saw the enormous size of the bunch or cluster of grapes which was cut down near the Brook Escol, and they also beheld the pomegranates and the figs.

Various and figurative. There is a host of other references to things botanical in the Bible, which might best be described as various and mostly figurative in nature, e.g., Man coming forth as a flower or as grass and flourishing for a little, but later being cut down and withering.
Job 14 : 2 and Psalm 90 : 6.

Again, there are similes such as a wife being like a fruitful vine, and children as olive plants around one's table. Psalm 128:3. There is also the picture of men going down to the grave in a full age "like a shock of corn cometh in his season." Job 5:26. Job had many other pictures

from the Vegetable Kingdom, as when he likened himself to a root spread out by the waters, and the dew lay all night upon his branch. Job 29:19. He vigorously protested his innocence and his industry by declaring in the day of his calamity, "If my land cry against me, or that the furrows likewise complain...Let thistles grow instead of wheat, and cockle instead of barley." Job 31 : 38 & 40.

The Second Book of Chronicles is usually thought to be somewhat dry reading, but it does give a good view of King Uzziah (ultimately a leper) who, we are told, "Had husbandmen also, and vine-dressers in the mountain, and in Carmel: for he loved husbandry." 2 Chronicles 26 : 10.

Solomon was also a man of the garden and the field for he declared in the Book of Ecclesiastes: "I made me great works; I builded me houses; I planted me vineyards; I made me gardens and orchards, and I planted trees in them of all kinds of fruits; I made me pools of water, to water therewith the wood that bringeth forth trees." Eccles. 2:4-6.

Jonah speaks of seaweed when he narrates his experiences in the words, "The depth closed me round about, and weeds were wrapped about my head." Jonah 2 : 5.

The Master himself added a superb illustration from tree life when inculcating spiritual truth to his disciples before He went out to die: "I am the true vine, and my Father is the husbandman...Every branch that beareth fruit he purgeth it, that it may bring forth more fruit...As

the branch cannot bear fruit of itself, except it abide
in the vine; no more can ye, except ye abide in me."
John 15: 1 - 8.

TREES PLANTS PRODUCTS FRUITS AND VEGETABLES : ONE REFERENCE

TREES

Algum..... 2 Chron. 2: 8
 Almond..... Eccles. 12: 5
 Almug..... 1 Kings 10:11
 Apple..... S. of S. 2: 3
 Ash (Fir-R.V.) Isa. 44:14
 Box..... Isaiah 41:19
 Cedar..... 1 Kings 10:27
 Chestnut.... Genesis 30:37
 Plane - R.V.
 Cypress.... Isaiah 44:14
 Holm - R.V.
 Elms..... Hosea 4:13
 Terebinth - R.V.
 Fir..... 1 Kings 5:10
 Gopher..... Genesis 6:14
 Hazel..... Genesis 30:37
 Almond - R.V.
 Mulberry.... 1 Chron. 14:14
 Myrtle Isaiah 55:13
 Oak..... 2 Sam. 18:9
 Oil..... Isaiah 41:19
 Olive..... Deuter 24:20
 Palm..... Exodus 15:27
 Pine..... Isaiah 41:19
 Poplar..... Hosea 4:13

Tiel..... Isaiah 6:13
 Terebinth - R.V.
 Shittah..... Isaiah 41:19
 Acacia - R.V.
 Sycamine..... Luke 17: 6
 Sycamore..... 1 Kings 10:27
 Vine..... Genesis 40:10
 Willows..... Levit. 23:40

PLANTS AND PRODUCTS

Aloes..... Psalm 45: 8
 Anise..... Matt. 23:23
 Balm..... Genesis 43:11
 Barley..... Deuter. 8: 8
 Bramble..... Judges 9:14
 Briers..... Judges 8: 7
 Palestine Night Shade
 Bulrush..... Exodus 2: 3
 Cane (Sweet).. Jerem. 6:20
 Calamus..... Exodus 30:23
 Camphire..... So. of S. 1:14
 Henna Flowers -R.V.
 Cassia..... Exodus 30:24
 Cinnamon..... Exodus 30:23
 Cockle..... Job 31:40
 Nonsense weeds) R.V.
 Coriander..... Exodus 16:31

PLANTS & PRODUCTS (CONT.)

Corn.....	Genesis	27:28	Millet.....	Ezek.	4:9
Cumin.....	Isai ah	28:25	Mint.....	Luke	11:42
Ebony (Wood)	Ezek.	27:15	Mustard.....	Matt.	13:31
Flags.....	Isai ah	19:6	Myrrh.....	Gene.	43:11
Flax.....	Jo shua	2:6	Nettles.....	Isa.	34:13
Fitches....	Isai ah	28:25	Oil.....	Isa.	41:19
Black Cumin - R.V.			Pulse.....	Dan.	1:12
Flour.....	Levit.	2:1	Herbs - R.V. Margin		
Frankincense	Exod.	30:34	Reed.....	1Kings	14:15
Galbanum....	Exod.	30:34	Rye.....	Exod.	9:32
Gall.....	Matt.	27:34	Spelt - R.V.		
Gourd.....	2Kings	4:39	Rose.....	So. of S.	2:1
Grass.....	Numbs.	22:4	Autumn Crocus - R.V.		
Hay.....	Prov.	27:25	Rue.....	Luke	11:42
Heath.....	Jerem.	17:6	Rushes.....	Isa.	35:7
Tamarisk - R.V.			Saffron.....	S.o.S.	4:14
Hemlock....	Ho sea	10:4	Shittim (Wood)	Exod.	26:15
Herbs.....	Exod.	12:8	Acacia - R.V.		
Husks.....	Luke	15:16	Spikenard.....	S.o.S.	1:12
Pods of Carob Tree	R.V. Mar.		Spices.....	Gen.	43:11
Hyssop.....	Levit.	14:4	Stacte.....	Exod.	30:34
Juniper....	1Kings	19:4	Tares.....	Matt.	13:25
Broom - R.V. Margin			Darnel - R.V.		
Lily.....	So. of S.	2:2	Thistles.....	Gen.	3:18
Linen.....	Esth.	1:6	Thorns.....	Gen.	3:18
Mandrakes....	Gen.	30:14	Weeds.....	Jonah	2:5
Mallow.....	Job	30:4	Wheat.....	Deut.	8:8
Salt-wort			Willows.....	Levit.	23:40
Meal.....	2Kings	4:41	Wormwood.....	Deut.	29:18

FRUITS

Almonds..... Genesis 43:11
 Apples..... Song of S. 2: 5
 Cucumbers..... Numbs. 11: 5
 Dates..... 2 Chron. 31: 5
 A.V. Margin
 Figs Numbs. 13:23
 Grapes..... Numbs. 13:23
 Melons..... Numbs. 11: 5
 Nuts..... Genes. 43:11
 Olive Berries.. James 3:12
 Olives - R.V.
 Pomegranates... Numbs. 13:23
 Raisins..... 1 Sam. 25:18
 Sycamore Fruit. Amos 7:14
 Species of wild fig

VEGETABLES

Beans..... 2 Sam. 17:28
 Garlic..... Numbs. 11: 5
 Leeks..... Numbs. 11: 5
 Lentiles..... Gene. 25:34
 Red Pottage
 Onions..... Numbs. 11: 5.

Z O O L O G Y

"God said, Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven. And God created great whales, and every living creature that moveth, which the waters brought forth abundantly, after their kind, and every winged fowl after his kind... And God said, Let the earth bring forth the living creature after his kind, cattle, and creeping thing, and beast of the earth after his kind: and it was so."

Genesis 1 : 20 - 24.

"There be things that are too wonderful for me... The way of an eagle in the air; the way of a serpent upon a rock." Prov. 30:18 & 19.

"There be four things which are little upon the earth, but they are exceeding wise: The ants are a people not strong, yet they prepare their meat in the summer; The comies are but a feeble folk, yet they make their houses in the rocks; The locusts have no king, yet they go forth all of them by bands; The spider taketh hold with her hands, and is in kings' palaces." Prov. 30:24 - 28.

"There be three things which go well, yea, are comely in going: A lion, which is strongest among the beasts, and turneth not away from any; A greyhound; an he-goat also."

Prov. 30:29 - 31.

Z O O L O G Y

Animal life played a large part in the thought of Hebrew writers and people. The protection and propagation of flocks and herds were matters of practical interest to them as a pastoral people. It might be averred that the Jews studied animal life more than the life of plants.

There are many references to beasts, birds, reptiles and insects in Bible pages. Mention is also made of more primitive forms such as the worm, snail, coral and sponge.

The Book of Job contains a great zoological picture. Job's 'treatise' - for so it might be called - is so arresting that I have felt it unwise to break it up or interfere with its continuity by comment.

The anatomy and physiology of animals are often referred to. Jacob's method to increase the number of a certain type of cattle has drawn the comment, "Surely this is the earliest record of the application of genetical principles in cattle-breeding!"

That the whale was a mammal was evidently known to the writer of the Book of Lamentations: "The sea-monsters draw out the breasts, they give suck to their young ones."
Lamentations 4 : 3.

Solomon - as quoted in the Foreword to this Section on Zoology - confessed that the ways of certain animals surpassed his comprehension. Other passages refer to the eagle stirring up her nest in teaching the eaglets to fly: the

dog's habit of returning to its own vomit; the flies and bees in holes and on thorns and bushes; the grasshoppers being found on the hedges in a cold day; the hen's care of her brood; and the stork and swallow knowing the time of their migration.

In the remote parts of Bechuanaland the Bushman - that nomad whom seemingly no one can tame - has as his chief means of livelihood a small bow and poisoned arrow. A grub is part of the bushman's stock in trade in producing the poison. Evidently similar equipment was known in the days of Job for he says, "The arrows of the Almighty are within me, the poison whereof drinketh up my spirit." Job 6 : 4.

The diseases of animals are less mentioned than the diseases of plants. Animals lame, blind or with a blemish were not to be offered in sacrifice. The Prophet Malachi has stinging words about such forbidden offerings in his day. Ezekiel speaks of diseased, sick and broken cattle being thrust aside with the shoulder and pushed with horns.

Various laws are given regarding animals - laws concerning the undesirability of diverse gendering, the separating of young from maternal care, the seething of a kid, the employment of ox and ass in one yoke together; the muzzling of oxen while they are treading out the corn.

There are lists given of the beasts, birds and fishes deemed to be clean and those to be reckoned unclean - edible and inedible.

Animals as sources of food supply have a definite place. Isaac, we are informed, loved savoury venison; one eminent doctor of divinity has accused him of becoming a gluttonous old man in this respect! Quails were an acceptable article of food to the people of Israel in their desert wanderings. Jesus was given broiled fish by His disciples after His Resurrection.

Zoological references, used figuratively to enforce moral and spiritual lessons, were a prominent feature of prophetic teaching.

Appended are lists of the beasts - mostly mammals, birds, reptiles and insects found in Scripture. There are only references to fish in general.

Creation. As the citation in the Foreword to this Section shows, we have a repetition of the simple yet sublime language employed to describe the creation of animal life, to which we drew attention in the account given of the creation of the prior Vegetable Kingdom. "Out of the ground the Lord formed every beast of the field, and every fowl of the air." Genesis 2 : 19.

And the crowning act of Creation was Man made in the image of God and after His likeness. And Man's pre-eminence was signalled by the statement: "Let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth. Gen. 1:26 & 27.

Destruction and Preservation of Animal Life

It does seem that excavation research by Sir Leonard Woolley, Prof. Langdon and Mr. G. F. Wright has confirmed that there was a flood as described in the sixth and eighth chapters of Genesis. One is again attracted by the simplicity of the language which narrates the story of the Flood.

We have heard the doggerel about the craziness of Old Man Noah, but he showed a practicality in the means he adopted for the ^{measurement} of the abatement of the waters - first by sending out a raven, which seems to have been less satisfactory for his purpose than the dove which he sent out later, and which "found no rest for the sole of her foot" but which came back subsequently with an olive leaf in her beak, and being sent out again, did not return. Gen. 8:6-12.

Anatomy and Physiology of Animals. Jacob evidently held to the superstition that offspring can be affected by prenatal impressions received by the mother. Jacob's success in the increase of striped and spotted cattle, which he desired, was due to selective breeding and not by placing partially peeled green wands beside the drinking troughs of the cattle. The contest between Laban and Jacob for increase of cattle - which increase still means so much to men in primitive communities - makes a fascinating study as it is told in the thirtieth and thirty-first chapters of Genesis. We do have evidence that Jacob was particularly

careful in the tending of his cattle, for when his mind must have been anxious about the reception he was likely to receive from his out-witted brother Esau, he still deemed it wise to separate his household and cattle into two bands, so that if he lost part he would not lose all, and yet he kept the flocks and herds with young under his own care, for he feared the herdmen would over-drive them and all the flock die because of rough treatment.

Genesis 32:7 & 8 and 33:13.

Job complains that there is no judgment falling on wicked men since "Their bull gendereth, and faileth not; their cow calveth, and casteth not her calf." Job 21:10.

Isaiah's statement "The ox knoweth his owner, and the ass his master's crib" - Isaiah 1:3 - is borne out in byres and stables. One was surprised to find when cattle were watered in Bechuanaland the animals day after day stood together in the same order at one trough.

Jeremiah comments on conditions of famine not only as they affect human beings but also as applied to animal life: "The wild asses did stand in the high places, they snuffed up the wind like dragons; their eyes did fail, because there was no grass." Jeremiah 14 : 6.

Job pictures more normal conditions when he asks: "Doth the wild ass bray when he hath grass: Or loweth the ox over his fodder?" Job 6 : 5.

The time is not yet which was prophesied by Isaiah when

"The wolf shall dwell with the lamb, and the leopard lie down with the kid; and the calf and the young lion and the fatling together... And the cow and the bear shall feed; thier young ones shall lie down together; and the lion shall eat straw like the ox. And the sucking child shall play on the hole of the asp and the weaned child on the cockatrice's den" without hurt. Isaiah 11:6-8. Nbr do we usually find what is pictured in the First Book of Kings - 13:23-30 - when a lion was found standing by the body of a man whom the lion had killed, and an ass was also standing by, and yet the lion had left the man's corpse and the ass intact.

The normal condition is found in the statement, "The young lions roar after their prey...The sun ariseth, they gather themselves together, and lay them down in their dens." Psalm 104 : 21 & 22.

Dr. W. M. Thomson in his valuable volume "The Land and the Book" has an attractive note on the allusion in the Song of Solomon - 2:8 & 9 - "My beloved is like a roe or young hart: behold, he cometh leaping upon the mountains, skipping upon the hills." Dr. Thomson adds, "These lovely harts are very timid, and descend at night to the plains to feed among the lilies until the day break and the shadows flee away." Song of Solomon 2 : 17.

There are references also to the habit of the dogs which in the evening go round the city, making a noise. Psa. 59:6. Also to the dog returning to his vomit. Prov. 26:11 and 2 Peter 2:22. The sow wallowing in the mire is also

mentioned in that same verse of the Second Epistle of Peter.

Birds. These often find a place in Scripture pages.

The sparrows and swallows alighted on suitable places to build their nests in the temple courts, and this was not frowned upon: "The sparrow hath found an house, and the swallow a nest for herself, where she may lay her young, even thine altars, O Lord of hosts." Psalm 84 : 3.

The birds also found the cedars of Lebanon a sanctuary, and the storks made the fir trees their houses. Psa.104:17. The storks also knew their appointed migrating time, and the turtle, crane and swallow observed the time of their coming. Jeremiah 8 : 7.

The eagle stirred up her nest - turning the little ones out that they might learn to fly - and she fluttered over them, and dived below them in their fall, and spread her wings to catch them and to carry them. Deuter. 32 : 11.

The hen gathered her brood under her wing. Luke 13:34. All these habits of the birds were noted and lessons drawn from them. Even the cooing of the doves and their tabbering on their breasts were written of. Nahum 2 : 7.

The judgments of the Almighty were likened to a gathering of eggs which were left, "and there was none that moved the wing, or opened the mouth, or peened." Isa. 10:14.

There is a fearful picture about what was coming to Edom - Idumea - which is to be so desolate that

"It shall be an habitation of dragons, and a court for owls. The wild beast of the desert shall also meet with the wild beasts of the island, and the satyr shall cry to his fellow: the screech owl also shall rest there, and find for herself a place of rest. There shall the great owl make her nest, and lay, and hatch, and gather under her shadow: there shall the vultures also be gathered, every one with her mate." Isaiah 34 : 13-15.

Reptiles. The African has no difficulty in accepting the statement about the serpent being more subtle than any beast of the field. Genesis 3 : 1. It will be seen from an appended table that the Bible lists a fair number of reptiles.

Insects. Neither has the African difficulty about the statement that the scorpion when he strikes can inflict pain that is tormenting. Revel. 9 : 5.

Solomon seems to have been impressed by the ways of ants - as all have been who have studied them - since he wrote, "Having no guide, overseer, or ruler, provideth her meat in the summer, and gathereth her food in the harvest." Proverbs 6 : 6 - 8.

Samson had reason to be startled by the fact that in the carcass of a lion he had slain, he later found a swarm of bees and honey. Hence his long remembered riddle "Out of the eater came forth meat, and out of the strong came forth sweetness." Judges 14:8 & 14.

The Prophet Nahum seems to have been an observant man when he took note of "the great grasshoppers, which camp

in the hedges in a cold day, but when the sun ariseth they flee away, and their place is not known where they are." Nahum 3 : 17.

And Isaiah was evidently well aware that the moth will eat up a garment - 51:8 + and that flies and bees rest in desolate valleys, and in holes of the rocks, and upon all thorns, and upon all bushes." Isaiah 7 : 18 & 19

In enforcing moral and spiritual truths there are many passing references to the anatomy, physiology and the habits of animals scattered through the pages of Scripture, e.g., the dissection of animals by Abraham - Genesis 15:9 & 10; the poison of serpents - Deuter. 32:24; the poison of asps and the deadly power of the viper's tongue - Job 30:16; Jeremiah's remarks upon the hind forsaking her young because there is no grass to sustain them - Jer. 14:5; the part-ridge sitting on eggs and not hatching them - Jer. 17:11; and the general hatred of the speckled (ravenous - R.V.) bird - Jere. 12:9.

Elijah warned King Ahab that when he died a violent death, dogs would lick his blood - 1 Kings 21:19 - and so it turned out that when Ahab was mortally wounded by an arrow, the blood ran out of the wound into his chariot, and when the chariot was washed dogs licked up the blood.

1 Kings 22 : 34 - 38.

The panting of the hart for water is vividly portrayed in Psalm 42:1.

Ezekiel not only pictures God as a Forester busy with transplantation - see Botany page 173 - but he also sees the eagle as the vehicle of seed transmission. Ezek. 17:2-7.

Micah speaks of the worms of the earth and their holes.
Micah 7:17.

Jacob in his deathbed blessings and exhortations mentions the wolf ravening and dividing the spoil, and an adder in the path biting the heels of a horse. Gen. 49:27 & 17.

Jesus mentions the eagles (vultures - R.V. margin) gathering round the carcass. Matt. 24 : 28.

Nahum vividly describes the habits of the lion providing for the lioness and whelps: "where is the dwelling of the lions, and the feeding place of the young lions, where the lion, even the old lion, walked, and the lion's whelp, and none made them afraid? The lion did tear in pieces enough for his whelps, and strangled for his lionesses, and filled his holes with prey, and his dens with ravin." Nahum 2:11&12. Isaiah also refers to the lion roaring as it, and the whelps, seek after prey. Isaiah 5 : 29. Amos eulogises the bravery of the shepherd in taking two legs or the piece of an ear out of the very mouth of the lion. Amos 3 : 12. A man named Hushai warned Absalom that his father King David, and his men might put up a strong fight against rebellion, being "chafed in their minds, as a bear robbed of her whelps in the field." 2 Sam. 17:8. Gideon was instructed to include in his army only "Everyone that lappeth of the water with his tongue, as a dog lappeth." These only numbered three

hundred. Those who "bowed down on their knees to drink water" totalled nine thousand, seven hundred. Judges 7:5-7. And, finally, another reference to the dog is the statement attributed to Solomon: "He that passeth by, and meddeth with strife belonging not to him, is like one that taketh a dog by the ears." Proverbs 26 : 17.

Diseases of Animal Life. A grievous murrain (anthrax?) is stated to have been found upon horses, asses, camels, oxen and goats as one of the Plagues of Egypt. Exod. 9:3.

A whole catalogue of animal diseases is listed when it is laid down that on offering animals - beeves, sheep or goats - the animal so offered must be a male without blemish. "Blind, or broken, or maimed, or having a wen, or scurvy, or scabbed, ye shall not offer these unto the Lord... Either a bullock or a lamb that hath any thing superfluous or lacking in his parts, thou mayest offer that for a free-will offering; but for a vow it shall not be accepted. Ye shall not offer unto the Lord that which is bruised, or crushed, or broken, or cut." Leviticus 22 : 19 - 24.

Malachi castigates the people of his day for bringing that which was torn, and the lame, and the sick. Mal.1:13.

In Ezekiel there is a strong picture of neglect of people under the figure of gross animal neglect:

"The diseased have ye not strengthened, neither have ye healed that which was sick, neither have ye bound up that which was broken." Ezek. 34:4.

Also -

"As for my flock, they eat that which ye have trodden with your feet; and they drink that which ye have fouled with your feet...I will judge between the fat cattle and between the lean cattle. Because ye have thrust with side and with shoulder, and pushed all the diseased with horns." Ezekiel 34 : 19 - 21.

Divine Laws regarding Animal Life

We saw that it was a law that diverse seeds were not to be sown in the same field - Botany page 176 - so it enjoined that cattle of diverse kinds were not to gender together. Levit. 19:19. Neither were an ox and an ass to be put into the same yoke to plough together. Deut. 22:10. The ox which was employed treading out the corn was not to be muzzled. Deut. 25:4. Perhaps even more striking was the humaneness which was expected in the treatment of parent animals with young. A kid was not to be seethed in its mother's milk. Exodus 23:19. When a bullock or sheen or goat was born it was not to be offered in sacrifice for the first seven days - it must be left with its mother. And both mother and offspring were not to be killed in the same day.
Levit. 22: 27 & 28.

Even in the case of birds, their young, their nests and their eggs, there were precise instructions: "If a bird's nest chance to be before thee in the way in any tree, or on the ground, whether they be young ones or eggs, and the dam sitting upon the young, or upon the eggs, thou shalt not take the dam with the young: But thou shalt in any wise

let the dam go, and take the young to thee." Deuter. 22:6&7.

Animals as Food Factors . As already remarked at the beginning of this Section, a certain doctor of divinity was not complimentary to Isaac because of Isaac's love of venison. The derogatory estimate was based principally on the statement, "Isaac called Esau his eldest son, and said unto him... Now therefore take, I pray thee, thy weapons, they quiver and thy bow, and go out to the field, and take me some venison; and make me savoury meat, such as I love, and bring it to me, that I may eat." Genesis 27 : 1 - 4.

The Israelites in their desert wanderings had not only manna to sustain them, but also, we are told, "At even the quails came up, and covered the camp." Exodus 16:13. Professor Rendle Short in his valuable book "Modern Discovery and the Bible" has written:

"On two occasions the Israelites were fed in the wilderness by vast quantities of quails. (Exod. 16:13; Numbers 11:31-33). The quail is a plump, heavy-feeding bird allied to the partridge, and in the Middle East it is migratory, flying in great flocks. They come in from the sea in September and October, or in April, when there is a wind behind them, and land in an exhausted condition. In one year over a million were exported from Sinai into Egypt. The Israelites 'spread them all abroad for themselves round about the camp', just as Herodotus tells us the Egyptians did, laying them on the sand to dry. Pliny relates that on one occasion they landed on a ship in such numbers that it sank."

Most people would agree that a negative answer is called for to Job's question, "Is there any taste in the white of an egg?" Job 6 : 6.

Dr. W. M. Thomson in his "Land and the Book" asks: "Is there any resemblance between a scorpion and an egg, to suggest the antithesis in our Lord's question, 'If he ask an egg, will he offer him a scorpion?'" To this Dr. Thomson adds, "There is no imaginable likeness between an egg and the ordinary black scorpion in this country (Palestine), neither in colour or size, nor, when the tail is extended, in shape. But old writers speak of a white scorpion, and such an one, with the tail folded up, as in specimens of fossil trilobites, would not look unlike a small egg. Perhaps the contrast, however, refers only to the different properties of the egg and the scorpion, which is sufficiently emphatic."

After His Resurrection, when Jesus appeared to His disciples beside the Sea of Galilee, it is recorded that He took bread and gave it to them, and fish also. John 21:13. Luke also notes that when the Lord came into the midst of the assembled disciples in Jerusalem, He asked them, "Have ye here any meat? and they gave him a piece of a broiled fish, and of an honeycomb." Luke 24 : 41 & 42.

The Apostle Peter told how "he became very hungry, and would have eaten: but while they made ready, he fell into a trance, And saw heaven opened, and a certain vessel descending unto him, as it had been a great sheet knit at the four corners, and let down to earth: wherein were all manner of four-footed beasts of the earth, and wild beasts,

and creeping things, and fowls of the air. And there came a voice to him, Rise, Peter; kill, and eat." Acts 10:9-13. Peter demurred on the ground that he observed in the sheet beasts which were accounted common or unclean, and he had never in his life broken the law by eating unclean things.

This leads us to the enumeration of beasts and birds which, in the Levitical or Mosaic Code, were listed as clean and unclean. In studying the lists given and the numerous references to animals and birds in Holy Writ, one is conscious that our translators of the Scriptures were by no means certain as to the particular animals and birds referred to, nor were they agreed, in many cases, when they made decisions.

The lists, however, are worthy of study and it will be noted that they differ slightly from what is accepted as clean and unclean, edible and inedible, in European lands to-day.

While the emphasis is placed on the prohibitory aspects, the lists being more detailed when stating what is not to be eaten, by a careful reading there is little doubt, except in a few cases, which are deemed clean.

The lists are largely composite from the eleventh chapter of the Book of Leviticus and the fourteenth chapter of Deuteronomy, and from certain stray references found in other parts of the Scriptures.

JOB'S ZOOLOGICAL PICTURE PANELS

"Wilt thou hunt the prey for the lion, or fill the appetite of the young lions, when they couch in their dens, and abide in the covert to lie in wait?"

Who provideth for the raven his food? when his young ones cry unto God, they wander for lack of meat. Job 38:39-41.

Knowest thou the time when the wild goats of the rock bring forth? or canst thou mark when the hinds do calve?

Canst thou number the months that they fulfil? or knowest thou the time when they bring forth? They bow themselves, they bring forth their young ones, they cast out their sorrows. Their young ones are in good liking, they grow up with corn; they go forth, and return not unto them.

Who hath sent out the wild ass free? or who hath loosed the bands of the wild ass? Whose house I have made the wilderness, and the barren lands his dwellings. He scorneth the multitude of the city, neither regardeth he the crying of the driver. The range of the mountains is his pasture, and he searcheth after every green thing.

Will the unicorn - Wild Ox - R.V. - be willing to serve thee? or abide by thy crib? Canst thou bind the unicorn with his band in the furrow? or will he harrow the valleys after thee? Wilt thou trust him, because his strength is great? or wilt thou leave thy labour to him? Wilt thou believe him, that he will bring home thy seed, and gather it into thy barn?

Gavest thou the goodly wings unto the peacock? or wings and feathers unto the ostrich? which leaveth her eggs in the earth, and warmeth them in the dust. And forgetteth that the foot may crush them, or that the wild ass may break them. She is hardened against her young ones, as though they were not her's: her labour is in vain without fear; Because God hath deprived her of wisdom, neither hath he imparted to her understanding. What time she lifteth up herself on high, she scorneth the horse and his rider.

Hast thou given the horse strength? thou hast clothed his neck with thunder? Canst thou make him afraid as a grasshopper? the glory of his nostrils is terrible. He paweth in the valley, and rejoiceth in his strength: he goeth on to meet the armed men. He mocketh at fear, and is not affrighted; neither turneth he back from the sword. The quiver rattleth against him, the glittering spear and the shield. He swalloweth the ground with fierceness and rage; neither believeth he that it is the sound of the trumpet. He saith among the trumpets, Ha, he! and he smelleth the battle afar off, the thunder of the captains, and the shoutings.

Doth the hawk fly by thy wisdom and stretch her wings toward the south?

Doth the eagle mount at thy command, and make her nest on high? She dwelleth and abideth upon the rock, upon the crag of the rock, and the strong place. From thence she seeketh the prey, and her eyes behold afar off. Her young ones also suck up blood: and where the slain are there is she. Job 39:1-30.

Behold now behemoth, which I made with thee; he eateth grass as an ox. Lo now, his strength is in his loins, and

his force is in the navel of his belly. He moveth his tail like a cedar; the sinews of his stones are wrapped together. His bones are as strong as pieces of brass; his bones are like bars of iron. He is chief of the ways of God: he that made him can make his sword to approach unto him. Surely the mountains bring him forth food, where all the beasts of the field play. He lieth under the shady trees, in the covert of the reed, and fens. The shady trees cover him with their shadow; the willows of the brook compass him about. Behold, he drinketh up a river, and hasteth not: he trusteth that he can draw up Jordan into his mouth. He taketh it with his eyes; his nose pierceth through snares. Job 40:15-24.

Canst thou draw out Leviathan with an hook? or his tongue with a cord which thou lettest down? Canst thou put an hook into his nose? or bore his jaw through with a thorn?...Wilt thou play with him as with a bird? or wilt thou bind him for thy maidens? Shall thy companions make a banquet of him? shall they part him among the merchants? canst thou fill his skin with barbed irons? or his head with fish spears? Lay thine hand upon him, remember the battle, do no more. Behold, the hope of him is in vain: shall not one be cast down even at the sight of him? None is so fierce that dare stir him up: who then is able to stand before me?...I will not conceal his parts, nor his power, nor his comely proportion. Who can discover the face of his garment? or who can come to him with his double bridle? Who can open the doors of his face? his teeth are terrible round about. His scales are his pride, shut up together as with a close seal. One is so near to another, that no air can come between them. They are joined one to another, they stick together, that they cannot be sundered. By his neesings a light doth shine, and his eyes are like the eyelids of the morning. Out of his mouth go burning lamps, and sparks of fire leap out. Out of his nostrils goeth smoke, as out of a seething pot or caldron. His breath kindleth coals, and a flame goeth out of his mouth. In his neck remaineth strength...The flakes of his flesh are joined together: they are firm in themselves; they cannot be moved. His heart is as firm as a stone: yea, as hard as a piece of the nether millstone. When he raiseth up himself, the mighty are afraid; by reason of breakings they purify themselves. The sword of him that layeth at him cannot hold; the spear, the dart, the habergeon. He esteemeth iron as straw, and brass as rotten wood. The arrow cannot make him flee: slingstones are turned with him into stubble. Darts are counted as stubble: he laugheth at the shaking of a spear. Sharp stones are under him: he spreadeth sharp-pointed things upon the mire. He maketh the deep to boil like a pot; he maketh the sea like a pot of ointment. He maketh a path to shine after him; one would think the deep to be hoary. Upon the earth there is not his like, who is made without fear. He beholdeth all high things; he is a king over all the children of pride." Job 41 : 1 - 34.

B E A S T SCLEAN

Ox
 Sheep
 Goat
 Hart
 Roebuck
 Fallow Deer
 Wild Goat
 Pygarg (Bison)
 Wild Ox (Antelope - R.V.)
 Chamois

UNCLEAN

Camel
 Coney
 Hare
 Swine
 Weasel
 Mouse
 Ferret
 Mole

B I R D S

Clean - "Of all clean
 fowls ye may eat." Deut.
 14:20.

The following may
 here be included -

Partridge
 Pigeons : Doves
 Quails
 Sparrows

Unclean

Eagle
 Ossifrage
 Osprey = Bible spelling
 Vulture
 Kite
 Raven
 Owl (Ostrich - R.V.)
 Night Hawk
 Cuckoo
 Little Owl
 Great Owl
 Cormorant
 Swan
 Pelican
 Gier Eagle
 Stork
 Heron
 Lapwing (Hoopoe - R.V.)
 Glede

F I S H

Clean - "These shall ye
 eat of all that are in
 the waters; whatsoever
 hath fins and scales in
 the waters, in the seas
 and in the rivers, them
 shall ye eat." Lev. 11:9

Unclean - "All that have not fins
 and scales in the seas, and in
 the rivers, of all that move in
 the waters, and of any living
 thing which is in the waters,
 they shall be an abomination
 unto you." Levit. 11:10.

Apes	1 Kings	10:22	Hind	Genesis	49:21
Ass	Genesis	22: 5	Horse	Genesis	47:17
Badger	Numbers	4: 6	Kid	Levit.	4: 23
Seal - R.V.			Kine	Genesis	32:15
Bat	Levit.	11:19	Lamb	Genesis	21:28
Bear	1 Sam.	17:34	Leopard	S.of S.	4: 8
Beeves	Levit.	22:19	Lion	Genes.	49: 9
Behemoth ...	Job	40:15	Mbuse	Levit.	11: 29
Bulls	Genes.	32:15	Mble	Levit.	11: 30
Calf	Levit.	9: 2	Mule	2 Sam.	13: 29 X
Camel	Genes.	12:16	Ox	Isai ah	11: 7
Chamois	Deut.	14: 5	Pygarg	Deuter.	14: 5
Coney	Levit.	11: 5	Ram	Genes.	15: 9
Rock Badger -R.V.	Margin		Roebuck	1 Kings	4: 23
Deer	1 Kings	4: 23	Satyr	Isai ah	13: 21
Roebuck - R.V.			He-goats -R.V.	Margin	
Dog	1 Sam.	24:14	Sheep	Genesis	21: 27
Dromedaries.	Isai ah	60: 6	Swine	Levit.	11: 7
Ferret	Levit.	11: 30	Unicorn	Numbs.	23: 22 XY
Gecko - R.V.			Wild Ox - R.V.		
Foxes	Judges	15: 4	Weasel	Levit.	11: 29
Jackals -R.V.	Margin		Whale	Matt.	12:40
Frog	Exodus	8: 2	Sea Monster -R.V.	Margin	
Goat	Genes.	15: 9	Wolf	Genes.	49: 27
Greyhound ..	Prov.	30: 31			
War Horse - R.V.					
Hare	Levit.	11: 6	XX It is disputed whether there		
Hart	Deuter.	12:15	ever was such a beast as a		
Heifer	Genes.	15: 9	Unicorn.		

X Mules were not known in Israel till King David's time; then they were imported. They contravene the law in Levit.19:19 which prohibits diverse gendering.

BIRDS OF SCRIPTURE : ONE REFERENCE

Bittern	Isai ah 14:23	Desert Owl	Psal m 107: 6
Cock	John 13:38	Great Owl	Levit. 11:17
Cormorant	Levit. 11:17	Little Owl.....	Levit. 11:17
Crane	Jerem. 8: 7	Screech Owl	Isa. 34:14
Cuckoo	Levit. 11:16	Night Monster - R.V.	
Seamew - R.V.		Partridge	1 Sam. 26:20
Dove	Genes. 8: 8	Peacock	2 Chrn. 9:21
Eagle	Levit. 11:13	Pelican	Levit. 11:18
Gr.Vulture -R.V.	Margin	Pigeon	Genes. 15: 9
Gier Eagle	Deut. 14:17	Quails	Exod. 16:13
Glede	Deut. 14:13	Raven	Genes. 8: 7
Fowl	1Kings 4:23	Sparrow	Psal m 84: 3
Hawk	Job 39:26	Stork	Levit. 11:19
Night Hawk	Levit. 11:16	Swallow	Jerem. 8: 7
Hen	Matt. 23:37	Swan	Levit. 11:18
Heron	Levit. 11:19	Turtle	Genes. 15: 9
Ibis - R.V.	Margin	Vulture	Levit. 11:14
Kite	Levit. 11:14	Kite - R.V.	
Lapwing	Levit. 11:19		
Hoopoe - R.V.			
O spray	Levit. 11:13		
Ossi frage	Levit. 11:13		
Eagle or Gr.Vulture -R.V.			
Ostrich	Job 39:13		

REPTILESONE REFERENCEINSECTS

Adder	Psalm	58: 4	Ants	Proverbs	6: 6
Asp	Job	20:16	Bees	Beuter.	1:44
Chameleon ...	Levit.	11:30	Beetle	Levit.	11:22
Cockatrice ..	Isa.	11: 8	Cricket -R.V.		
Basilisk :	Adder -R.V.		Caterpillar ..	Psalm	78:46
Dragon	Psalm	91:13	Flea	1 Sam.	24:14
Horseleech ..	Prov.	30:15	Flies	Psalm	78:45
Lizard	Levit.	11:30	Gnat	Matt.	23:24
Leviathen ...	Job	41: 1	Grasshopper .	Eccles.	12: 5
Crocodile -	R.V.		Hornet	Exodus	23:28
Serpent	Genes.	3: 1	Lice	Psalm	105:31
Tortoise	Levit.	11:29	Locusts	Levit.	11:22
Gr. Lizard -	R.V.		Moth	Job	27:18
Viper	Job	20:16	Scorpion	Deut.	8:15
			Spider	Job	8:14

VARIOUS

Worms	Exodus	16:24
Snail	Psalm	58: 8
Onycha	Exodus	30:34
Coral	Job	28:18
Sponge	Matt.	27:48

P H Y S I C S

"In the beginning God created the heaven and the earth. And the earth was without form, and void; and darkness was upon the face of the deep. And the spirit of God moved upon the face of the waters. And God said, Let there be light; and there was light. And God saw the light, that it was good: and God divided the light from the darkness. And God called the light Day, and the darkness he called Night... And God said, Let there be a firmament in the midst of the waters, and let it divide the waters from the waters."
 Genesis 1:1-6.

"In them (the heavens) hath he set a tabernacle for the sun; which is as a bridegroom coming out of his chamber, and rejoiceth as a strong man to run a race. His going forth is from the end of the heaven, and his circuit unto the ends of it: there is nothing hid from the heat thereof."
 Psalm 19:4-6.

"The wind goeth toward the south, and turneth about unto the north; it whirlieth about continually, and the wind returneth again according to his circuits."
 Eccles. 1 : 6.

"The wind bloweth where it listeth, and thou hearest the sound thereof, but canst not tell whence it cometh, and whither it goeth."
 John 3 : 8.

"The skies sent out a sound: thine arrows also went abroad. The voice of thy thunder was in the heaven: the lightnings lightened the world: the earth trembled and shook."
 Psalm 77: 17 & 18.

P H Y S I C S

The Bible demonstrates clearly that observation of Natural phenomena was common to Hebrew writers.

The Creation of the Earth, as narrated in Genesis, and dwelt upon in other passages of Scripture, was considered a great theme, only to be expounded in measured language.

It has been pointed out that light is one expression of energy. This fact is linked with the statement 'the Spirit of God moved' - and there was resultant light. In the Book of Psalms there is the statement that God stretched out the heavens as a curtain. Psalm 104:2. The meaning of the Hebrew word employed is 'thinness'. It is said that the ether is so very thin that an amount the size of our world could be compressed into an ordinary teacup.

An assertion such as "He hangeth the earth upon nothing" - Job 26:7 - was a long way ahead of many ancient conceptions concerning the world and its supports.

With regard to momentum, Sir Isaac Newton (1642-1727) is said to have stated his belief that men would yet travel on the face of the earth at the rate of sixty miles per hour. He supported his statement by quoting the passage "Many shall run to and fro, and knowledge shall be increased!" Daniel 12:4.
Thomas Paine, the agnostic, is said to have laughed at Newton for such an idea, and sought to point out that it showed the foolish lengths to which religious belief would lead a devotee. To-day the laugh is against Tom Paine.

Meteorology is often referred to in the Bible. Clouds, rain, rainbow, winds, dew, vapour and mist are all mentioned prominently: "A cloud of dew in the heat of summer" - Isa. 18:4 - was unfavourable to crops. "The heat with the shadow of a cloud" - Isaiah 25:5 - is an allusion to the prostrating wind from the Syrian desert. The north wind was evidently a cold wind, and one also which dispersed rain: "Fair weather cometh out of the north" - Job - 37:22. Jesus spoke of the south wind as warm; Job stated it to be oppressive. The writers of Psalms and Ezekiel made it clear that the east wind, coming as it did from the desert, was destructive by its scorching quality. The west wind, being from the sea, was refreshingly cool and brought rain.

The twenty-ninth Psalm is an arresting picture of a storm rising from the Mediterranean and sweeping across Palestine.

Electricity - as seen in the lightning flash, though unknown by the modern name - was a common phenomenon. How common lightning is can be vouched for by anyone who has lived in the tropics or sub-tropics. Such natural fireworks occur every night for weeks on end at certain seasons.

To take soundings at sea at regular intervals during a voyage was the practice of sailors is proved by the Book of Acts.

The Book of Job - in addition to its botanical and zoological pictures already instanced - deals with subjects included in the modern Science of Physics.

Creation. The very first words of the Bible deal with God's creation of natural phenomena. Before the Vegetable and Animal Kingdoms appeared there was the composite setting of the stage where they could play their parts. Light took the place of darkness; order succeeded apparent chaos; the waters of the clouds were separated from the waters which were to remain in the world; and these waters of the world were called Seas, and the dry land appeared and was named Earth. Genesis 1 : 1 - 10.

God's handiwork has never ceased to call forth exclamations of admiration and praise; this was so marked in the case of such as the Psalmist that the spirit of poetry in him became lyrical as he cried, "O Lord my God, thou art very great: thou art clothed with honour and majesty: Who coverest thyself with light as with a garment; who stretchest out the heavens like a curtain: Who layeth the beams of his chambers in the waters; who maketh the winds his chariot; who walketh upon the wings of the wind." Psalm 104:1-3. Thereafter follows a description of God's handiwork in separating the waters and the mountains to their places, similar to that given in the first chapter of Genesis.

The Prophet Isaiah also chants his praise of God's handiwork by asking a number of pointed questions and himself supplying the appropriate answers: "Who hath measured the waters in the hollow of his hand, and meted out heaven with a span, and comprehended the dust of the earth in a measure, and weighed the mountains in scales and the hills in a balance?"

...It is he that sitteth upon the circle of the earth, and the inhabitants thereof are as grasshoppers; that stretcheth out the heavens as a curtain, and spreadeth them out as a tent to dwell in." Isaiah 40: 12 & 22.

Light : Heat : Darkness. The creation of the sun and moon for the purpose of giving light to the world is expressly stated in that the greater light was to rule the day and the lesser light to rule the night. Their functions also would be to divide the day from the night, the light from darkness, and they were to be signs for days, seasons and years. Genesis 1 : 14 - 18.

The Psalmist again attributed all to God, for he stated, "The day is thine, the night also is thine: thou hast prepared the light and the sun." Psalm 74:16. He also brought out that God had appointed the moon for seasons, the sun knew her going down, and God also ordained the darkness and thus we have night. Psalm 104 : 19 & 20.

The writer of the Book of Ecclesiastes gives the then popular view of the sun's orbit, "The sun also ariseth, and the sun goeth down, and hasteth to his place, where he ariseth" Ecclesiastes 1 : 5.

Job again showed he studied natural phenomena in still another domain when he stated, "Drought and heat consume the snow waters." Job 24 : 19.

The male lover in the Song of Solomon transferred the qualities of sun and moon to his beloved when he exclaimed,

"Who is she that looketh forth as the morning, fair as the moon, clear as the sun." Song of Songs 6 : 10.

Lightning and Thunder. Doubtless those who lived in Bible times, like those who live in tropical and sub-tropical lands to-day, found something fearsome in the vivid flashes of lightning and the tremendous crashes and peals of thunder which increase in severity the nearer one lives to the Equator.

Lightning. The Psalmist writes of God making lightnings for the rain. Psalm 135:7, and the lightnings lightening the world, so much so that "the earth saw and trembled. The hills melted like wax." Psalm 97:4 & 5. In Psalm 77:17&18 there is also a reference to the arrows of God going abroad and lightening the earth.

Jesus Himself spoke of the lightning coming out of the east and shining even to the west. Matt. 24 : 27.

Thunder. The Psalmist also spoke of the voice of God's thunder being in the heavens and causing the earth to shake and tremble from the skies sending out a sound. Psa. 77:17&18.

Meteorology. There is abundant evidence that the natural phenomena of wind, cloud, rain, rainbow, mist and dew were studied from earliest biblical times. The Book of Job is admitted to be one of the earliest written Bible Books, and it has long passages concerning what we to-day term the Science of Meteorology.

Jesus has a direct reference to the habit of observing the sky in an attempt to forecast weather conditions when He says, "When it is evening, ye say, It will be fair weather; for the sky is red; and in the morning, It will be foul weather to-day; for the sky is read and lowring." Matt. 16 : 2.

wind. In the First Book of Kings there is a striking portrayal of Nature given in the experience of the Prophet Elijah: "The Lord passed by, and a great and strong wind rent the mountains, and break in pieces the rocks, before the Lord; but the Lord was not in the wind: and after the wind an earthquake; but the Lord was not in the earthquake: And after the earthquake a fire; but the Lord was not in the fire: and after the fire a still small voice." 1 Kings 19 : 11 & 12.

Perhaps more striking is the Psalmist's description of a storm rising from the Mediterranean Sea and sweeping over the Land of Palestine, and gradually dying away and a great calm following:

"The voice of the Lord is upon the waters: the God of glory thundereth: the Lord is upon many waters, The voice of the Lord is powerful; the voice of the Lord is full of majesty. The voice of the Lord breaketh the cedars of Lebanon... The voice of the Lord divideth the flames of fire. The voice of the Lord shaketh the wilderness: the Lord shaketh the wilderness of Kadesh. The voice of the Lord discovereth the forests: and in his temple doth everyone speak of his glory. The Lord sitteth upon the flood; yea, the Lord sitteth King for ever. The Lord will give strength unto his people: The Lord will bless his people with peace." Psalm 29 ; 1 - 11.

In the Book of Proverbs Agur asks, "Who hath gathered the winds in his fists?" Proverbs 30 : 4.

It is recorded that Jesus showed control over the elements in the treacherously stormy Sea of Galilee when "He arose, and rebuked the winds and the sea; and there was a great calm. But men marvelled, saying, 'What manner of man is this, that even the winds and the sea obey him!'"
Matt. 8 : 26 & 27.

See also Mark 4:39-41 and Luke 8:22-25.

Clouds. Job attributed to God the binding up of the waters in His thick clouds, so that the clouds are not rent under them. Job 26:8. Elihu sought to draw out Job's reverence by appealing to him to "Look upon the heavens, and see; and behold the clouds, which are higher than thou." Job 35 : 5.

Rain and Rainbow. One need not stress the connection between cloud and rain. One heard the echo of the rain in the storms which have been pictured. The first and the latter rains were eagerly anticipated by the people.
Deuter. 11 : 14.

In the eyes of the Jewish nation God's favour was as the latter rain. Proverbs 16:15.

It takes little imagination to see and hear the approach of a tremendous storm of rain when Elijah's servant looked from the top of Carmel towards the sea, and reported that there was a cloud rising though it was no bigger than a man's hand. This drew from Elijah the urgent advice, "Go

up, say unto Ahab, Prepare thy chariot, and get thee down, that the rain stop thee not. And it came to pass in the meanwhile, that the heaven was black with clouds and wind, and there was a great rain." 1 Kings 18 : 41 - 45.

The minutesness of the details given of the Flood in the time of Noah indelibly fixes the event on the reader's mind. Genesis chapter 8. Probably in later days when Noah saw heavy clouds gathering, in order to bring poise to his mind he recalled the promise, typified by the rainbow, that there would be no further Deluge: "God said, ... I do set my bow in the cloud, and it shall be for a token of a covenant between me and the earth, that the bow shall be seen in the cloud: And I will remember my covenant, which is between me and you and every living creature of all flesh; and the waters shall no more become a flood to destroy all flesh." Genesis 9 : 12-15.

Dew. The dew was regarded as one of the precious things from heaven, and so Moses in his parting word to the Tribe of Joseph wishes that dew be upon their land. Deut. 33:13.

We may accept the presence of dew implied in the words, "There went up a mist from the earth, and watered the face of the ground." Genesis 2 : 6.

Gideon asked for a sign by the dew being present or absent from his fleece and from the ground. These were to be tokens and the seal of God's presence, guidance and favour. Judges 6 : 36 - 40.

Soundings at Sea.

Luke was more than a physician who was well-versed in the language and practice of the then famous Greek Medical School, for the Gospel which bears his name and the Book of the Acts of the Apostles prove him to have been a keen observer of what went on around him, and one who could write graphically of events. Hence we have his description of the soundings taken of the depth of the sea by the sailors when he accompanied Paul on his stormy journey to Rome: "About midnight the shipmen deemed that they drew near to some country; And sounded, and found it twenty fathoms: and when they had gone a little farther, they sounded again, and found it fifteen fathoms. Then fearing lest we should have fallen upon rocks, they cast four anchors out of the stern, and wished for the day." Acts. 27 : 27-29.

DESCRIPTION OF NATURAL PHENOMENA : BOOK OF JOB

"God is great, and we know him not, neither can the Number of his years be searched out. For he maketh small the drops of water: they pour down rain according to the vapour thereof: which the clouds do drop and distil upon man abundantly. Also can any understand the spreadings of the clouds, or the wise of his tabernacle? Behold, he spreadeth his light upon it, and covereth the bottom of the sea... With clouds he covereth the light; and commandeth it not to shine by the cloud that cometh betwixt. The wise thereof sheweth concerning it, the cattle also concerning the vapour. Job 36 : 26-33.

At this also my heart trembleth, and is moved out of his place. Hear attentively the noise of his voice, and the sound that goeth out of his mouth. He directeth it under the whole heaven, and his lightning unto the ends of the earth. After it a voice roareth: he thundereth with the voice of his excellency; and he will not stay them when his voice is heard. God thundereth marvellously with his voice; great things doeth he, which we cannot comprehend. For he saith to the snow, Be thou on the earth; likewise to the small rain, and to the great rain of his strength. He sealeth up the hand of every man; that all men may know his work... Out of the south cometh the whirlwind; and cold out of the north. By the breath of God frost is given; and the breadth of waters is straitened. Also by watering he wearieth the thick cloud; he scattereth his bright cloud, And it is turned round about by his counsels; that they may do whatsoever he commandeth them upon the face of the world in the earth. He causeth it to come, whether for correction, or for his land, or for mercy.

Hearken unto this, O Job: stand still, and consider the wondrous works of God. Dost thou know when God disposed them, and caused the light of his cloud to shine. Dost thou know the balancings of the clouds, the wondrous works of him which is perfect in knowledge? How thy garments are warm when he quieteth the earth by the south wind? Hast thou with him spread out the sky, which is strong, and as a molten looking glass? Teach us what we shall say unto him; for we cannot order our speech by reason of darkness. Shall it be told him that I speak? if a man speak, surely he shall be swallowed up. And now men see not the bright light which is in the clouds: but the wind passeth and cleanseth them. Fair weather cometh out of the north: with God is terrible majesty." Job 37 : 1 - 22.

"The Lord answered Job out of the whirlwind, and said, Who is this that darkeneth counsel by words without knowledge? Gird up now thy loins like a man; for I will demand of thee, and answer thou me. Where wast thou when I laid the foundations of the earth, declare, if thou hast understanding. Who hath laid the measures thereof, if thou knowest? or who stretched the line upon it? Whereupon are

The foundations thereof fastened? or who laid the corner stone thereof, when the morning stars sang together, and all the sons of God shouted for joy? Or who hath shut up the sea with doors, when it brake forth, as if it had issued out of the womb? When I made the cloud the garment thereof, and thick darkness a swaddling band for it, And brake up for it my decreed place, and set bars and doors, And said, Hither shalt thou come, but no further; and here shall thy proud waves be stayed? Hast thou commanded the morning since thy days; and caused the dayspring to know his place; That it might take hold of the ends of the earth. ..? It is turned as clay to the seal; and they stand as a garment...Hast thou entered into the springs of the sea? or hast thou walked in the search of the depth...Hast thou perceived the breadth of the earth? declare if thou knowest it all. Where is the way where light dwelleth? and as for darkness, where is the place thereof, that thou shouldest take it to the bound thereof, and that thou shouldest know the paths to the house thereof? Knowest thou it because thou wast then born? or because the number of thy years is great? Hast thou entered into the treasures of the snow? or hast thou seen the treasures of the hail?...By what way is the light parted, which scattereth the east wind upon the earth? Who hath divided a watercourse for the overflowing of waters; or a way for the lightning of thunder; To cause it to rain on the earth, where no man is; on the wilderness, wherein there is no man; To satisfy the desolate and waste ground; and to cause the bud of the tender herb to spring forth? Hath the rain a father? or who hath begotten the drops of dew? out of whose womb came the ice? and the hoary frost of heaven, who hath gendered it? The waters are hid as with a stone, and the face of the deep is frozen...Knowest thou the ordinances of heaven? canst thou set the dominion thereof in the earth? Canst thou lift up thy voice to the clouds, that abundance of waters may cover thee? canst thou send lightnings, that they may go, and say unto thee, Here we are?...Who can number the clouds in wisdom? or who can stay the bottles of heaven, when the dust groweth into hardness, and the clods cleave fast together." Job 38 : 1 - 38.

It has been stated that Capt. Scott, when he came to the last lap of his dash to the South Pole, reduced his baggage to the barest minimum. So much did he do so that he did not take his Bible, but tore a page out of it. That page was specially chosen, since it contained the statement, "Hast thou entered into the treasures of the snow?" Job 38:22.

The psalmist as well as Job has given a vivid picture of Nature in the midst of her workings. Such a picture we have in 2 Samuel 22:8-16, and, curiously, it is repeated word for word in Psalm 18:7-15. Psalm 18 is largely a summary of the life of King David:

"The earth shook and trembled; the foundations of heaven moved and shook, because he was wroth. There went up a smoke out of his nostrils, and fire out of his mouth devoured: coals were kindled by it. He bowed the heavens also, and came down; darkness was under his feet... he was seen upon the wings of the wind. And he made darkness pavilions round about him, dark waters, and thick clouds of the skies. Through the brightness before him were coals of fire kindled. The Lord thundered from heaven, and the Most High uttered his voice. And he sent out his arrows, and scattered them; lightning and discomfited them. And the channels of the sea appeared, and the foundations of the world were discovered, at the rebuking of the Lord, at the blast of the breath of his nostrils."

2 Samuel 22:8-16 and Psalm 18:7-15.

C H E M I S T R Y

"They said one to another...let us make brick, and burn them thoroughly. And they had brick for stone, and slime had they for mortar." Genesis 11:3.

"Take away the dross from the silver, and there shall come forth a vessel for the finer." Proverbs 25:4.

"The streams of brooks they pass away; which are blackish by reason of the ice, and wherein the snow is hid: what time they wax warm, they vanish: when it is hot, they are consumed out of their place." Job 6:15-17.

"The kingdom of heaven is like unto leaven, which a woman took and hid in three measures of meal, till the whole was leavened." Matt. 13:13.

"No man putteth new wine into old bottles; else the new wine will burst the bottles, and be spilled, and the bottles shall perish. But the new wine must be put into new bottles; and both are preserved." Luke 5:37&38.

C H E M I S T R Y

Chemistry as a science is of comparatively recent date, but chemistry as an art was known to the ancients.

The Bible shows that the Jews were familiar with quite a number of chemical processes.

The metals gold and silver are often referred to, and the refining processes for the purifying of these valuable metals seem to have been well known. Other metals such as copper, brass, iron, lead, tin and even steel are mentioned, some of them quite frequently.

Salt was in common use, salt from the Dead Sea being a household commodity. Every sacrificial oblation was to be seasoned with salt. We have proof that Jesus held salt in high esteem since he commended His disciples as the salt of the earth.

Mortar as a mineral substance was much employed. Even the builders of the Tower of Babel made bricks and burned them thoroughly, and, we are also told, that "they had bricks for stone, and slime they had for mortar." Gen.11:3.

The ill effects of using untempered mortar is mentioned by the Prophet Ezekiel.

That bones contained lime was knowledge not hid, as is seen in the words of Amos, "Moab...burned the bones of the king of Edom into lime." Amos 2:1.

The corrosive action of rust was observed. The action of an acid on an alkali did not escape notice. Wax was

known to melt, water to boil, and ice to turn to water at a certain temperature.

Sulphur was present in the hot springs of Palestine.

The soap referred to in the Bible is believed to have been a vegetable alkali - nitre plus olive oil.

Organic chemistry also finds a niche in Scripture pages. Fermentation and the damage it could play with insecure containers was emphasised by Jesus. The elimination of leaven at the time of the Passover celebrations was, and is still to-day, a matter of conscience with all strict Jews.

The dyes spoken of in Scripture are to be noted. Scarlet is believed to have been obtained from cochineal; blue from shell-fish.

Appended are lists of dyes, metals, mineral substances and precious stones which are mentioned in the Bible.

Metals. As early as the second chapter of Genesis we are told of the land of Havilah that "the gold of that land is good." Genesis 2 : 12.

In the First Book of Kings we read: "Jehoshaphat made ships of Tharshish to go to Ophir for gold." 22:48. Previously Hiram had brought Solomon gold from the land of Ophir. "According to an old commentator Ophir lies somewhere in the land of Safala, or in the vicinity of the Zambesi River opposite the island of Madagascar, where there have been gold and silver mines in great abundance

since the remotest antiquity." This seems like sending for gold to southern Africa, and yet the gold around Johannesburg was only discovered - or rediscovered? - within the last three generations.

Among the offerings which Moses was advised to take from the children of Israel, for use in the Tabernacle, was gold, silver and brass. Exodus 25 : 3.

That silver was currency in Abraham's day is proved by the fact that in buying the Cave of Machpelah Abraham "weighed to Ephron the silver, which he had named in the audience of the sons of Heth, four hundred shekels of silver, current money with the merchant." Genesis 23:16.

Brass was reckoned a very hard metal. In blessing the Tribe of Asher, Moses said, "Thy shoes shall be iron and brass." Deuter. 33 : 25. In the Book of Daniel there is a reference to a strong kingdom which shall arise - probably Grecian under Alexander the Great - which is described as a kingdom of brass. Daniel 2:39. Iron was also reckoned a very hard metal - "Thy neck is an iron sinew." Isa. 48:4. In Notes written by Dr. V. Ball for the Bible Readers' Manual, issued under the authorship, or rather editorship, of Dr. C. H. H. Wright, there is the following:

"Although there is evidence in favour of the view that, accidentally, by the smelting of combined ores of copper and zinc, brass may have been produced in very early times, and may have been even regularly manufactured in places where the ores occurred naturally together, and may moreover have been the alloy of oriental origin referred to by

some writers as more precious than gold (amber), still it is supposed that the regular manufacture of brass is not older than the 13th century. Where our translators use the term brass, copper should often be understood. At the same time it is to be remembered that the alloy of copper and tin, known as bronze, has been in use since very early times, and in the countries of the west of Europe at least, its use preceded that of iron. The brazen serpent, the sacrificial forks, the mirrors of the Hebrew women, etc., were probably made of bronze."

When Eleazar the priest was detailing the law to the men of war regarding what booty would be unclean and must be subjected to the seven days ritual of cleansing, he named certain exceptions in the words, "The gold, and the silver, the brass, the iron, the tin, and the lead, Everything that may abide the fire, ye shall make it go through the fire, and it shall be clean." Numbers 31 : 22 & 23.

Amber is translated in the Margin of the Revised Translation of the Bible as 'Electrum'. Electrum has been described as an alloy of gold and silver in use among the ancients.

Mineral Substances : Deposits : Derivatives

We have seen in the Foreword to this Section that people in early times knew how to make burnt bricks. Gen. 11:3.

The people of Israel served with rigour in Egypt and their lives were made bitter with hard bondage in mortar and brick. Exodus 1: 14. In the Prophecy of Jeremiah we are told of his sojourn in Egypt and that when he was in Tahpanhes he was told to "Take great stones in thine hand,

and hide them in the clay in the brick-kiln, which is at the entry of Pharaoh's house in Tahpanhes." Jere. 43:9.

When the children of Israel were delivered from Egypt and were about to enter the Promised Land they were instructed to set up a monument of great stones and plaster the stones with mortar, and write the Law on the monument." Deuter. 27 : 2.

The above instances raise the question of the material which was used in making plaster. At the building of the Tower of Babel we are told they had slime for mortar. A little later in the Book of Genesis we are informed that the Vale of Siddim was full of slime pits. Genesis 14:10. The Vale of Siddim was probably in the region of the Dead Sea.

Slime - Bitumen - it is said was used in very early times in the buildings of Chaldea. (See Hastings's Dictionary of the Bible, Vol. 1, pages 304 and 305). Mortar was later made with lime and clay.

Pitch like slime seems to have been made of Bitumen - that is mineral bitumen. Pitch is mentioned in a number of instances, the best examples being in connection with making Noah's Ark water-tight. Genesis 6:14, and also the little ark of bulrushes which held the child Moses, and which is described as "daubed with slime and with pitch." Exod. 2:3.

Sulphur as Brimstone is frequently mentioned in the Bible. The hot springs of Palestine are mostly sulphur springs. Sulphur, as is well known, is a common constituent of vol-

-came. And so brimstone and fire are commonly found together in Scripture pages. Sodom and Gomorrah were blotted out by fire and brimstone. Genesis 19:24. Isaiah prophesies that Idumea will have streams turned into pitch, and her dust into brimstone, and that land shall be ^{-come} burning pitch. Isaiah 34:9.

Salt is early spoken of in Bible pages. Even those with a sketchy knowledge of Scripture generally know that Lot's wife was turned into a pillar of salt for her disobedience. Other references to salt are to be found under Materia Medica on pages 125 and 126.

Chemical Processes. Numerous references to chemical processes are encountered in reading Scripture.

Solomon speaks of the fining pot being for silver, and the furnace for gold; thus indicating that the purifying properties latent in a temperature of a given degree were clearly understood. Proverbs 17:3. And the refining process is further referred to when the advice is given to take away the dross from the silver and there shall come out a vessel fit for the finer. Proverbs 25:4. Job knew the same refining process in his very early day, though he applied it to himself figuratively in the words, "When he hath tried me, I shall come forth as gold." Job 23:10.

That the furnace was employed for the purifying of various other metals is seen by the analogy which the Prophet Ezekiel made use of when he said the word of the

Lord came to him saying, "Son of man, the house of Israel is to me become dross: all they are brass, and tin, and iron, and lead, in the midst of the furnace; they are even the dross of silver...As they gather silver, and brass, and iron, and lead, and tin, into the midst of the furnace, to blow the fire upon it, to melt it; so will I gather you... and melt you." Ezekiel 22 : 18 & 20.

Jesus was emphatic that His followers should not lay up treasure upon earth, where rust corrupts. Matt. 6:19. And the Apostle James, in his criticism of the selfish rich men of his day, rebuked their hoarding of wealth. "Your gold and silver is carked: and the rust of them shall be a witness against you." James 5 : 3.

Unpleasant chemical reactions. That unpleasant chemical reactions were known is implied in the words, "As vinegar to the teeth, and as smoke to the eyes, so is the sluggard." Proverbs 10:26.

A similar allusion is conjured up by the statement, "As vinegar upon nitre, so is he that singeth songs to an heavy heart." Proverbs 25:20.

The boiling of water is spoken of by Isaiah as a result of the melting fire burning. Isaiah 64:2. The Prophet Jeremiah bemoans a conflagration when he speaks of the bellows being burned and the lead consumed in the fire causing the founder to melt in vain. Jeremiah 6 : 29.

That wax was known to melt before the fire is proved

by the figure of speech, "As wax melteth before the fire,
so let the wicked perish." Psalm 88 : 2.

Organic Chemistry.

On reading the sayings of Jesus one is profoundly impressed by His powers of observation and the application He made of common phenomena in His teaching. That He noticed the results of fermentation is evident from His remark about not putting new wine into old bottles - as quoted in the Foreword to this Section on Chemistry. Also in the Foreword we have his words about the common household process which involves an organic chemical reaction - that of the leaven in the meal or dough.

Job has something to say in every department we have touched upon in this consideration of the Bible's contribution to the Art and Science of Medicine, and we find that this department of organic chemistry is no exception, for in contending with God he cries, "Hast thou not poured me out as milk, and curdled me like cheese," Job 10:10.

* * * * *

C H E M I S T R Y

D Y E S

<u>COLOUR</u>	<u>ONE REFERENCE</u>
Blue	Ezekiel 27: 7
Crimson	2 Chron. 2:14
Green	Esther 1: 6
Purple	Proverbs 31:22
Red	Exodus 25: 5
Scarlet	Proverbs 31:21
Vermilion	Ezekiel 23:14

M E T A L S

<u>NAME</u>	<u>ONE REFERENCE</u>
Gold	Genesis 24:53
Silver	Genesis 23:15
Brass	Judges 16:21
Copper	Ezra 8:27
Brass - R.V.	
Lead	Numbers 31:22
Tin	Numbers 31:22
Iron	Judges 4: 3
Steel	Job 20:24
Brass - R.V.	
Amber	Ezekiel 1: 4
Or Electrum - R.V. Margin.	

C H E M I S T R Y

MINERAL SUBSTANCES

<u>NAME</u>	<u>ONE REFERENCE</u>
Adamant	Ezekiel 3: 9
Bitumen	Genesis 11: 3
- R.V. Margin	
Chalk stones	Isai ah 27: 9
Clay	Isai ah 29:16
Earth	Job 12: 8
Dust	Genesis 2: 7
Flint	Psalm 114: 8
Marble	Esther 1: 6
Nitre	Jeremi ah 2:22
Lye - R.V.	
Salt	Levit. 2:13
sand	Proverbs 27: 3
slime	Genesis 11: 3
Bitumen - R.V. Margin	
Brimstone	Genesis 19:24
(Sulphur)	

C H E M I S T R Y

PRECIOUS STONES AND PEARLS

<u>NAME</u>	<u>ONE REFERENCE</u>
Agate	Exodus 28:19
Amethyst	Exodus 28:19
Beryl	S.of Sol. 5:14
Topaz - R.V. Margin	
Carbuncle	Exodus 28:17
Emerald - R.V. Margin	
Chalcedony	Revel. 21:19
Chrysolite	Revel. 21:20
Chrysoprasus	Revel. 21:20
Diamond	Jerem. 17: 1
Emerald	Exodus 28:18
Jacinth	Revel. 9:17
Hyacinth - R.V.	
Jasper	Exodus 28:20
Ligure	Exodus 28:19
Jacinth - R.V.	
Onyx	Genesis 2:12
Beryl - R.V. Margin	
Sapphire	Exodus 24:10
Sardius	Exodus 39:10
Sardonyx	Revel. 21:20
Topaz	Job 28:19
Coral	Job 28:18
Pearls	Job 28:18
Crystal - R.V.	
Rubies	Job 28:18
Red Coral - R.V. Margin	

P O S T S C R I P T

In the writer's time as a student at Glasgow University two outstanding exponents of their respective subjects were Dr. (later Professor) D. M. Blair in Anatomy and Professor W. Macneille Dixon in English Literature. Prof. Blair in published works extolled the Bible, and added:

"The Bible is not a scientific textbook. If it were you would not find a copy of it even in second-hand bookshops - scientific books are ephemeral things which have their little day of changing editions and their right of oblivion. But the Bible is not unscientific, for it is true, and will be found to be true to everything of true science... True science is knowledge, and knowledge is some part of truth; that will never be found in opposition to the Book of Truth."

Professor Macneille Dixon wrote of the Englishman "in an easy and inclusive sense which overlooks regional differences" and recognised "Scotsmen and Irishmen who are as English as their southern and eastern neighbours." It was in this context that he wrote one of his finest essays - "The English Bible." Here he says -

"That the Bible entered into, and took possession of the English imagination no one needs to be told. It is common knowledge. But it is knowledge which is also a revelation. A revelation of what? you ask. A revelation of the poet and mystic hidden in the English heart. Overlook the influence of the Bible upon Englishmen, and you write of them without understanding, you write but you write in vain. You may bring to bear upon an interpretation of their nature and history a wealth of learning and a wealth of wit, but your arrow will miss its mark. For like a painter's canvas the Bible forms the entire background not merely of our religious and moral, but of our literary history."

Those of us whose lives are spent in the practice of our professions - often blending with scientific discipline a measure of art or craftsmanship - would go even further. We would acknowledge our indebtedness to the Bible for the light it sheds on the experiences that come to us day by day. In no profession is this more apparent than in the practice of medicine in its several branches and specialties.

The structure of our teaching curriculum in the medical schools has necessarily evolved out of man's broad experience of empirical observation and his grasp of scientific concepts. For twelve hundred years - since the influence of the English Bible began to make itself felt on the common people, its wealth of medical lore has had far-reaching effects on the quality of professional practice and teaching. The writer of these pages has attempted a systematic presentation of this biblical knowledge of medicine, and he hopes that the claims which he makes for the status of the Bible as a source-book for the physician, and for its contribution to the Science and Art of Medicine, will not seem altogether unwarranted.

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It is only right to acknowledge my indebtedness to many Professors and Lecturers who had references to the Bible in their lectures, particularly in their Opening Lectures when they dealt with the History of Medicine in general and their own subjects in particular.

My interest in the Bible's Contribution to the Art and Science of Medicine could be traced, in large part, to these references; which, garnered in the mind and later transferred to manuscript sheets, led me to the study of the subject and to the compilation of this Thesis which I now present.

I N D E X

- Abdomen & Thorax
 - Anatomical parts of, 147
 Absalom's fine physique, 146
 Accidental Death, 88
 Acid & Alkali, 223
 Adultery, 90
 Alcohol, 124, 152
 Alcoholism, 23, 24, 178
 Alimentary Diseases, 22, 135
 Alimentary System, 8
 Aloes, 120, 121
 Alopecia, 74
 Amaurosis, 28, 63
 Amber, 226, 231
 Amputations, 45
 Anaesthesia, 37
 Anatomy, 5, 140
 Anatomical Terms in Bible, 147, 148
 Anatomist's Chapter, 141, 142
 Anatomy of Animals, 189, 196
 Anatomy of Female, 145
 Anatomy of Male, 145
 Anatomy of Plants, 170
 Anger, 162
 Angina Pectoris, 26
 Animal Diseases, 196
 Animals - edible & inedible, 99, 109-111, 201
 Animals as Food, 198
 Animal Heat, 128
 Animals - Lists of, 204
 Animals - Slaughter of, 111
 Arise, 123
 Anointing of Dead, 120, 121
 Ante-Natal Care, 51
 Anterior Poliomyelitis, 17, 32
 Anthrax, 21
 Antidotes to Poisons, 31, 116, 128
 Anti-sepsis, 6, 38
 Ants - Solomon and, 185
 Apex of Heart, 146,
 Aphasia, 25,
 Aphrodisiac, 117
 Appetite - loss of, 23
 Apoplexy, 25, 134
 Arm - anatomical parts of, 147
 Artificial Respiration, 73, 128
 Art of Apothecary, 116, 117

Assault - Common, 81, 89
Atrophy, 136

Bacteriology, 138
Baldness, 74, 75
Balm of Gilead, 123
Barking of Trees, 169
Basic Sciences, 165
Battlements, 80
Beasts - Clean and Unclean, 109, 201
Bechuanaland, 10, 187
Beheading, 86
Bestiality, 90
Birds, 201
Birds - Lists of, 205
Birth - Normal and Abnormal, 53
 - Difficult, 54
 - Precipitate, 53
 - Premature, 53
Bitumen, 227
Blains, 20
Blair, Prof. D.M., 21, 34, 41, 99, 234, 236
Blasting, 175
Blepharitis, 61
Blindness, 32
 - Causes of, 61
 - Two stage cure, 62
Blushing, 163
Boils, 16, 20
Botany, 165, 166
Bowel - Perforation of, 43, 135
 - Sloughing of, 135
Brass, 225, 226, 231
Breasts - Dry, 50
Brick, 226
Brimstone, 227
Bronze, 226
Burial, 98, 104
 - on large scale, 104
Burning, 86
Burrowing of roots, 169, 172
Bushman & poisoned arrow, 187
Calabar, 10, 129
 - Calabar Bean, 129
Camphire, 120
Canaan's Fruitfulness, 178
Cankerworm, 176
Caper-berry, 124
Carbohydrates, 117, 123

Carbuncle, 16
 Cardiac Rupture, 25, 26, 134
 Carlyle, Thomas, 168
 Cassia, 157
 Castration, 44
 Catalepsy, 27
 Caterpillar, 176
 Cattle-breeding, 186
 Cave of Machpelah, 133
 Cheese, curdling of, 230
 Chemistry, 165, 221
 - Organic, 224, 230
 Chemical Processes, 228
 Childbirth, 52
 Children - Diseases of, 70
 Child Welfare, 56
 Circulatory Diseases, 24, 134
 Circulatory System, 8
 Circumcision, 43, 44
 Cities of Refuge, 79, 87
 Clay, 227, 232
 Cleansing of Priests, 112
 Cleft Palate, 29
 Climatic Conditions, 173
 Clinical Pathology, 132
 Clouds, 210, 215
 Club-foot, 29
 Collie, Sir John, 28
 Collier, Dr. James, 7
 Coma, 24
 Compensation for Injury, 6, 78, 88
 Concussion, 40
 Consanguinity & Marriage, 93
 Co-ordination of body parts, 150, 152
 Copper, 226, 231
 Corn blasted, 173
 Corrosion, 229
 Creation, 170, 188, 209, 211
 Cremation, 104
 Criminal Offences, 81
 Crook-backt, 29, 131
 Crucifixion, 86
 Cucumis Prophetarum, 129
 Cummin, 123
 Cures by Jesus - List of, 32

Darkness, 20, 212
 David, King, - feigned insanity, 67
 Day, 32, 212

- Dead - anointing of, 120, 121
 Dead - raising of, 32
 Dead - washing of, 104
 Deafness, 32, 65
 Death - accidental, 86
 - - attitude to, 72
 - - by beheading, 86
 - - burning, 86
 - - crucifixion, 86
 - - hanging, 84
 - - sawing asunder, 86
 - - stoning, 85
 - - suffocation, 83
 Decomposition of body, 133
 Dew, 210, 216
 Diagnoses - differential, 106
 Diet - suitable, 157
 Dietetics, 127, 158
 Digestive Function, 157
 Diseases - undiagnosed, 33
 - - of animals, 134
 - - barring from priesthood, 29, 134
 - - of Plants, 173
 Dislocation, 44
 Dissection of Body, 132
 Diverse seeds, 112, 176
 Diverse things, 112
 Divorce and Disease, 92
 Dreams, 163, 164
 Drop-wrist, 29
 Dropsy, 32
 Dross, 229
 Dumbness, 65
 Dyes - List of, 231
 Dysentery - acute, 17
 - - chronic, 16

 Ear, boring hole in, 46
 - cut off, 64
 Ear, Throat & Nose, 63
 Earth, 211, 219
 Earthquake, 214
 Ecstasy, 161
 Egypt's Fruitfulness, 178
 Electrum, 231
 Elliot, Dr. R. H., 236
 Embalming, 105, 132, 133
 Embryology, 141, 143.

- Emesis, 23
 Emissions, 98, 103
 Epilepsy, 7, 32, 72
 Ether, 209
 Euruchs, 44
 Excrement, 103
- Faeces, 103
 Fainting, 25
 Fallow fields & year, 169, 176
 Falls, 40, 41
 Famine, 23, 137, 190
 Favus, 75
 Fear, 161
 Female Form described, 145
 Fermentation, 222, 230
 Fertility, 52
 Fever, 32
 Fish, 109, 201
 Five Senses, 152, 154
 Flatulence, 23
 Flies - Plague of, 20
 Flood - The, 189, 216
 Foetal Movements, 52
 Food - Animal, 198
 Foreign bodies in eye, 62
 Fowls, 110
 Fractures, 25, 39, 139
 - of Abimelech, 39
 - - Eli, 25, 139
 - - Goliath, 40
 - - Sisera, 40
 Frankincense, 120
 Frogs - Plague of, 20, 21
 Frombœsia, 15, 137
 Frost, 174.
 Fruit Trees - Law of, 112, 176
 - - - Preservation of, 177
 Fruits - List of, 183
 Fuller's Soap, 127
 Fungi, 169
 fungus in garment, 107
- Gall, 125
 Gangrene, Senile, 134
 Garlic, 123
 Gastritis, 22
 Genesis - Value of Book, 80

Gigantism, 29, 144
 Glandular - Diseases, 29
 - - System, 8
 Gleaning - Law of, 176
 God as Forester, 173
 Gold, 224
 Gonorrhoea, 19, 92
 Goring, 89
 Grafting, 169
 Greek Medical School, 9, 34
 Gummata of Syphilis, 137
 Gynaecology, 58

Haemorrhage - Uterine, 54, 58
 Hail, 219
 - Plague of, 20
 Hamsin, 21
 Hanging, 84
 Head & Neck - anatomical parts of, 148
 Heart - apex of, 146
 - - rupture of, 134, 25
 Hearing, 155
 Heat, 212
 Heavens as a curtain, 209
 Hemiplegia, 27
 Hezekiah's boil, 16
 Hobart, Dr. W.K., 45, 236
 Hospitals - foreshadowing of, 38
 Hunch-back, 29
 Hunger, 158
 Husbandry, 179
 Hydrotherapy, 118, 127
 Hyssop, 123

Ice, 219, 224
 Immorality, 91
 Impediment of Speech, 32
 Incest, 92
 Incineration, 6, 107
 Inertia, Uterine, 56
 Infantile Paralysis, 17
 Injuries - abdominal, 42
 Insects, 186
 - Lists of 206
 Insect Pests, 174
 Insanity, 66
 Intelligence of Animals, 190
 Intestinal Parasites, 43
 Iron, 226, 229, 231

Issue, 97
Itch, 75

- Jacob's Thigh Condition, 44, 45
 Jairus' Daughter, 9
 Jealousies - Law of, 93
 JESUS CHRIST, 9, 14, 15, 25, 32, 62, 65, 69, 121, 124,
 134, 143, 167, 171, 172, 174, 179, 180, 199, 215
 Jesus - Cures by, 32, 33
 - and Blind, 62
 - - Deaf, 65
 - - Insane, 68, 69
 - - Lepers, 14, 15
 - Burial of, 121
 - Death of, 25, 134
 - & Fruit Bearing, 179, 180
 - declines Narcotics, 124
 - His love of Nature, 171
 - & Physiology of Plants, 172
 - His power over natural phenomena, 215
 - & Scorpion & Egg, 199
 - His simile of seed dying, 171
 - and Soils, 167, 174
 - His Wounds, 143
 Jews and Cancer, 109
 Job and Natural Phenomena, 218, 219
 Job's Disease, 15
 Job and Embryology, 143
 - Plant Physiology, 167, 172
 - Taste, 156
 Job's Zoological Pictures, 202, 203
 John's Anatomical References, 146
 Joy, 160
 Keller, Helen and Deaf, 65
 Kyphosis, 29, 32, 46
 Labour - Normal & Abnormal, 53
 - - Difficult, 54
 - Precipitate, 53
 - Premature, 53
 Laceration of Ear, 32, 64
 Lactation, 56
 Lameness, 32
 Land and the Book, 18, 129, 191, 199, 236
 Langdon, Prof., 189
 Lanugo - Persistent, 55
 Laudanum, 125
 Laughter, 162

Law of Diverse Things, 112
 - - Fruit Trees, 112, 176
 Laws regarding Animal Life, 197
 - - Plant - , 176
 Lead, 223, 226, 231
 Leaven, 109, 224, 230
 Leg - anatomical parts of, 147
 Lepers, 14, 15
 Leper Psalm, 14
 Leprosy, 14, 15, 32, 105, 137
 Levites - Cleansing of, 112
 Levitical Law and Blind, 61
 - - - Deaf, 63
 - - - Gonorrhoea, 92
 - - - Husbandry, 112
 - - - Leprosy, 105, 106
 Lice - Plague of, 20
 Licentiousness and Disease, 18, 19
 Light, 212
 Lightning, 213, 218
 Lime, 105, 223
 Liston, Colonel, 8
 Livingstone, Dr.D., 133, 158
 Lochia, 102
 Locusts, 20, 21, 110, 174
 Locusts and Honey, 158
 Love-apples, 124
 Luke, St., 5, 9, 34, 151, 217

MacAlister, Prof.A., 45
 Macewen, Sir.Wm. 8, 38
 Malaria Fever, 18
 Male Form - Description of, 145
 Malformations, 131
 Malingering, 28
 Mandrakes, 117, 124
 Mania, 32, 66, 67
 Manslaughter, 68
 Marriage & Relationship, 93
 Marshes - Capernaum, 18
 Master Tissues, 153, 154
 Mastich, 125
 Materia Medica & Therapeutics, 115
 Medical - Priestly of O.T., 9
 Medical Jurisprudence, 77
 Medical Student and Anatomy, 143
 Medicine - Modern, 6, 11
 Meningitis - Cerebro-spinal, 17, 32
 Mephibosheth's Lameness, 29, 71
 Metals, 224

- Metals - Refining of, 228
 - Lists of, 231
 Meteorology, 213-216
 Metritis - Chronic, 135
 Metrorrhagia, 32, 58
 Midwifery, 47
 Midwives, 53, 54
 Mildew, 175
 Minerals, List of, 231
 Mineral Substances, 226, 232
 Mint, 123
 Miriam's Leprosy, 14
 Miscarriage, 50, 88
 Mist, 213
 Moldenke, H. N. & A. L., 169, 236
 Moplegia, Brachial, 27
 Moon, 212, 213
 Moral Perversion, 91.
 Morbid Anatomy, 132
 Morphology, 144
 Mortar, 226,
 Mortar & Pestle, 119
 Morton, H. V., 38, 113, 114, 236
 Mosaic Law, 79, 97, 98, 142
 Mosaic Law & Hygiene, 99
 Mosquitoes, 18, 20
 Mould in house, 108
 Murder, 81
 Murrain of Cattle, 20, 21
 Muscle, 153,
 - Fatigue of, 154
 Music - Therapeutic, 66, 128
 Mustard, 123
 Mutilation, 93
 Myelitis, 27
 Myrrh, 116, 120, 121, 125, 157
 Narcotics, 124, 152
 Nebuchadnezzar, King - Mania of, 67
 Neck & Head - anatomical parts of, 148
 Nervous Diseases, 26, 136
 Nervous System, 8
 Neurasthenia, 26
 Newton, Sir Isaac, 209
 Night, 212
 Nightmare, 161
 Nitre, 117, 127, 229
 Nise - Saddle, 29
 Nursing, 38

 Oil, 117, 121
 - in Aminting, 122

- Oil as Food, 122
- - Illuminant, 122
- in Meat Offering, 122
- as Medicine, 122, 123
- Ointments, 119, 120
- Omentum, 42
- Ophthalmology, 61
- Order of Creation, 211
- Oriental Sore, 15, 136
- Osteology, 144
- Overlying, 57

- Paine, Thomas, 209
- Palmerworm, 175
- Palpation - light and deep, 155, 156
- Paralysis - General, 27
- - Infantile, 17
- - Wasting, 136
- Paraeslegia, 27, 32
- Pathology, 130
- Paul, St. Anatomical References of, 5, 146
- - and Epilepsy, 63
- - - Plant Grafting, 172
- Perforation of Bowel, 43, 135
- Perfumes, 119
- Perineal Tear, 55
- Philistines and Plague, 13
- Physics, 165, 207
- Physiology, 149
- of Animals, 189
- - Plants, 167, 170
- and Psychology, 151
- Physique, 144
- Physostigmine, 129
- Pigmentation of Skin, 159
- Pitch, 227
- Plague, 8, 13
- Transmission, 9
- Plagues of Egypt, 20, 21
- Plaster of Figs, 127
- Plants as Food, 177
- Plants and Products - Lists of, 181, 182
- Poisons, 31
- Poisonous Fumes, 41
- Poisons and Antidotes, 31, 128
- Policeman of Abdomen, 42
- Poliomyelitis - Anterior, 17
- Polydactylism, 146

Polygamy, 50
 Popular Medical Prescription, 22
 Postscript, 234
 Precious Stones, List of, 233
 Pregnancy, 57
 Prevention of Accidents, 79
 Preventive Medicine, 99
 Priest and Dead Relatives, 101
 Priests - cleansing of, 112
 Primary Senses coupled, 156
 Primipara, 50
 Primitive Medicine - crudity of, 5
 Prolapsus Ani, 135, 17
 Prostatic enlargement, 30
 Prostitution, 90
 Psalmist's Nature picture, 220
 Psoriasis, 76
 Public Health, 6, 96
 Public Health Measures, 97-114

Quails and Plague, 13
 Quails, 187, 198
 Quarantine, 100

Rain, 215, 216, 219, 220
 Rainbow, 215
 Rape, 91
 Renal Disease, 29
 Renal System, 8
 Reproductive System, 8
 Reptiles, 193
 - List of, 206
 Resin, 125
 Respiration - Artificial, 73, 128
 Rheumatism, 8
 Rib - Resection, 37
 Ringworm, 74
 Ritual of Purifying, 97, 106, 107
 Rodents and Plague, 9
 Roller Bandage, 42
 Running, 152
 Runners of Adonijah, 153
 Rupture of Heart, 25, 134
 Rust, 229

Saffron, 120
 Salt, 56, 125, 228

Sandflies, 20
 Sandfly Fever, 20
 Saul, King - Insanity of, 66, 67
 Sawing asunder, -86
 Scab or Favus, 75
 Scabies, 75
 Scorpion - Sting, 199
 Scott, Capt., 219
 Seas, 211
 Secretion of Milk, 159
 Seelig, Dr. M. G., 98, 236
 Segregation, 6, 14, 105
 Selective Breeding, 186, 189
 Senile Gangrene, 134
 Senility - Signs of, 30, 31
 Sennacherib & Plague, 13
 Senses - Five, 154-157
 Sepsis - Ulcerative, 136
 Sex obsession, 80
 Shock, 41
 Shepherd, Dr. R. H. W., 26, 236
 Short, Prof. A. Rendle, 26, 198, 236
 Sight, 154
 Sighing, 152
 Silver, 222, 225, 231
 - as Currency, 225
 Simple Living - benefits of, 150, 152
 Skeletal Diseases, 8, 29
 Skin Diseases, 74
 Slaughter of Animals, 111
 Sheep, 163
 Sleeping Sickness, 27
 Slime, 227
 small-pox, 17, 18, 137
 Smell - Sense of, 155
 Snakes & Snake Bite, 31
 Snow, 219
 Snowman, Dr. J. 19, 153, 236
 Soap, 127, 224
 - Fuller's, 127
 Sodomy, 91
 Soil, Adverse Conditions, 174
 Soul - Origin of, 151
 Soundings at Sea, 210, 217
 Spices, 119
 Spikenard, 120
 Spitting - Disease by, 103
 Spittle, 158
 Spleen, 153
 Sprain, Jacob's Thigh, 44, 45

Springs, 219
 Steel, 231
 Sterility, 49
 Stones - Precious, 233
 Stoning, 85, 86
 Storm - Description of, 214
 Stroud, Dr., 25
 Styptics, 39
 Suicide, 94
 - Instances of - Ahithophel, 94
 - - - Judas, 94
 - - - Saul, King, 94
 - - - Zimri, 94
 Suffocation, 83
 Sulphur, 127, 227
 Sun, 212, 213
 Sunstroke, 28
 Surgery, 35
 Swallowing, 158
 Sweat, 160
 Swimming, 152
 Syncope, 25
 Syphilis, 27, 138

Talipes, 29
 Talmudic Medicine, 153
 Taste, 155
 Tattooing, 93
 Testicular Injury, 131
 Therapeutics, 115
 Therapy - Filth, 6
 Thomson, Dr. W.M., 18, 129, 199, 236, 191
 Thirst, 159
 Thorax & Abdomen - anatomical parts of, 147
 Thunder, 213
 Tiberias - City of, 101
 Tidy, Sir Letheby, 236
 Tin, 226, 229, 231
 Tinea Tonsurans, 74
 Touch, 155
 Trachoma, 63
 Trance, 27
 Transmission of Seeds, 169
 Transplantation, 169
 Trees - "uncircumcised", 176
 - Lists of 181
 Tropical Ulcer, 15, 16
 Tuberculosis, 8, 27, 71
 Twins, 55

Ulcers, 15
 Ulcerative Sepsis, 136
 Umbilical Cord - Uncut, 6, 56
 Unclean Beasts, 99, 109-111, 201
 Uncleaness, 100
 - by touching bone, 100
 - - - - - dead body, 100
 - - - - - grave, 100
 - - - - - dead beast, 101
 - - childbirth, 102
 - - emissions, 103
 - - Issue, 102
 Unipara, 50
 Unnatural Offences, 90
 Uterine Haemorrhage, 54, 58, 135
 - Inertia, 56

Vapour, 210, 218
 Varicose Ulcers, 45, 135
 Vegetables - List of, 183
 Venereal Diseases, 18, 19, 27, 138
 Viper, 31
 Vinegar, 229
 Virgin Birth, 58
 Vomiting, 23

Walking, 152
 Washing of Dead, 104
 Water boiling, 229
 Watercourse, 219
 Watering by Furrows, 170
 Water Systems, 99, 113
 Wax, 223, 230
 Weaning, 56
 - Feast of, 57
 Weather forecasting, 214
 Weeping, 161
 - to exhaustion, 161
 Welfare State, 79
 Wheeler & Jack's Handbook of Medicine, 236
 Whirlwind, 218
 Whitla, Sir Wm., 236
 Wife like fruitful vine, 178
 Winds, 208, 214, 215
 Wine, 36, 118, 124, 125
 Witnesses, 82
 Woolley, Sir Leonard, 189
 Workmen's Compensation Act, 79

Worms, 175
 - Intestinal, 43
 Wounds, 36, 38, 81, 143
 - Healing of = blue, 38
 - Washing of, 39
 - by bow and arrow, 81
 - - javelin, 81
 - - knives and lancets, 81
 - - sling and stone, 81
 - - spear, 81
 - - tent-pin, 83
 - - various weapons, 81,
 Wright, Dr. C.H.H., 225, 236
 Wright, G.F., 189
 Wrist-drop, 29

Yaws, 15, 137
 Yellow Fever, 20

Zinc, 225
 Zoology, 165, 184.