



PLANTS OF THE BIBLE

HAROLD N. MOLDENKE
ALMA L. MOLDENKE

PLANTS OF THE BIBLE

Twelve years in the preparation, this classic work is the standard reference on Biblical botany, combining scientific research with theological and classical scholarship, and eradicating the misinformation that has often been recorded in the past concerning Bible plants. Two hundred and thirty plants mentioned in the Bible are treated in detail, each beginning with references to them in scripture and proceeding to botanical descriptions of appearance and use; references to the plant in the non-Christian literature of antiquity and in the records of non-botanical writers and travelers in the Holy Land; etymological comparisons; comparative plant lore; symbolism and variations in translations of the Bible. The work illuminates and clarifies many Biblical passages and references, and also gives fascinating insights into daily life in Biblical and earlier times through plant use. Among the plants dealt with are henna, cinnamon, cotton, myrrh, cedar, sandalwood, myrtle, mandrake, lilies and thorns. There are line drawings, a bibliography, index to Bible verses, general index and a section of plates.

Dr HAROLD N. MOLDENKE was Curator of the Herbarium, New York Botanical Garden. **ALMA L. MOLDENKE** was a biologist.

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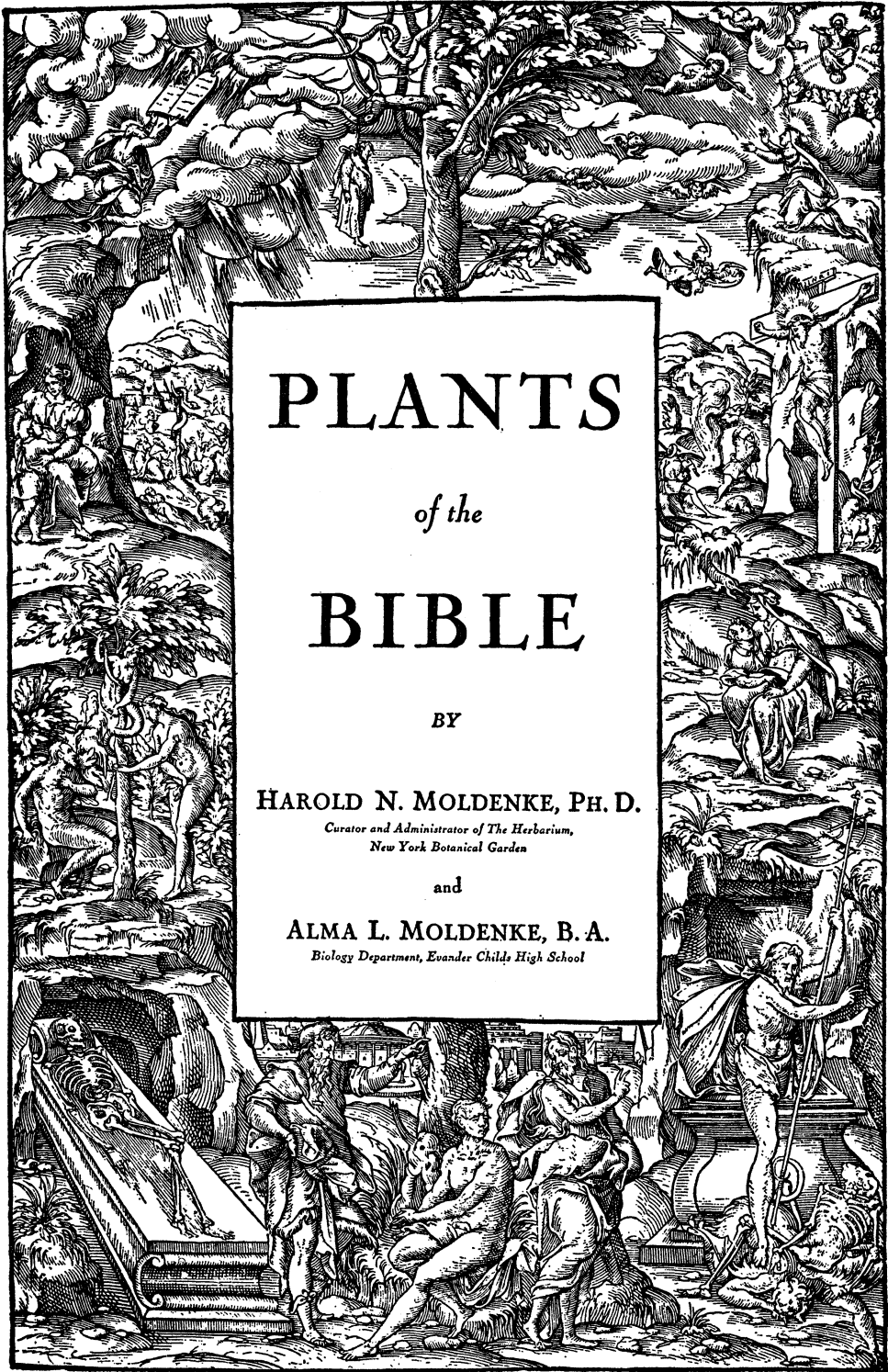
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BIBLE

BY

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*Curator and Administrator of The Herbarium,
New York Botanical Garden*

and

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FIGURE 1. — *Cedrus libani*. A grove of giant Cedars-of-Lebanon on white limestone in Lebanon, with the snow-capped peaks of Dar el Kodib in the background. Thus did this Prince of Trees grow in Biblical times before man brought destruction and near-extinction to the species! (Wood engraving from C. W. Wilson's Picturesque Palestine, 1883; see also p. 64 and fig. 52).

FIGURE 1. — *Cedrus libani*. A grove of giant Cedars-of-Lebanon on white limestone in Lebanon, with the snow-capped peaks of Dar el Kodib in the background. Thus did this Prince of Trees grow in Biblical times before man brought

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Preface

Twelve years have elapsed since we began work on this résumé of present day knowledge of Biblical botany. During the course of the work much assistance was rendered us by many friends and colleagues, and by the staffs of various libraries. Especially do we wish publicly to acknowledge our deep appreciation of the help given us by various members of the staff of the American Museum of Natural History, the American Geographical Society, the College of Physicians and Surgeons, Columbia University Library, the Jewish Theological Seminary, the New York Academy of Medicine, the New York Botanical Garden, the New York Public Library (especially the Jewish Reading Room), and Union Theological Seminary, all in New York City, and of the Arnold Arboretum at Jamaica Plain, Massachusetts, and the Hebrew University at Jerusalem. We are also most grateful to Mr. T. K. BARRIE, of Coudersport, Pa., for information graciously supplied about the lentisk tree; to Mrs. GRACE ESTERNAUX, of the Biology Department of Evander Childs High School, New York City, for checking all the Greek words of the text in the Septuagint and in various concordances, Greek dictionaries, and lexicons; to Dr. MICHAEL EVENARI, of the Botany Department of the Hebrew University at Jerusalem, for his gift of illustrations and for his reading of and valued criticisms of the whole text; to the late Dr. J. M. GREENMAN, of the Missouri Botanical Garden, St. Louis, for his checking of certain bibliographic materials; to Dr. ROBERT F. GRIGGS, of George Washington University, Washington, for information relative to the banana-grape controversy; to Miss ELIZABETH C. HALL, librarian of the New York Botanical Garden, for her perennial assistance, so cheerfully rendered, in many bibliographic problems; to Rev. ALBERT K. HERLING, then of Tufts College and pastor of the Unity Community Church, Natick, Mass., for his careful checking of references from the Apocrypha and for other assistance; to Rev. Dr. JOHN HAYNES HOLMES, distinguished pastor emeritus of the Community Church, New York City, for his reading of certain chapters and especially for his helpful advice and enthusiastic encouragement of the whole project; to Miss BARBARA HOSKINS, then of the New York Botanical Garden library staff, for her copious and very efficient help in bibliographic matters; to Dr. and Mrs. MOSES BARRAS, and Mrs. SYLVIA KAPLAN, of the Hebrew Department of Evander Childs High School, New York City, for their invaluable aid in checking all the Hebrew characters and transliterations; to Miss ROSLYN NORTON, erstwhile instructor in Hebrew at the Schiff Jewish Cultural Center, New York City, and Mr. MARTIN NORTON, Hebrew student, for checking the Hebrew words and Old Testament references in ancient and modern Hebrew Bibles and for providing some and checking all their English transliterations; to the late Professor ALFRED REHDER, of Arnold Arboretum, for valuable information regarding the geographic distribution of certain species of trees; to Mr. W. T. STEARN, of the Royal Horticultural Society, London, for information about lilies, onions, papyrus, etc.; to Mr. JASON R. SWALLEN, of the United States National Museum, Washington, for information relative to grasses; to Dr. LOUIS C. WHEELER, of the University of Southern California, Los Angeles, for information about Biblical dyes and their sources; to Miss CAROL WOODWARD, then editorial assistant at the New York Botanical Garden, for many helpful suggestions during the course of the work; to Mr. E. R. VAN LIEW, of Givaudan-Delawanna Company, New York, for information on labdanum; to Dr. JOHN C. TREVOR, Director of the Department of English Bible, National Council of Churches of Christ in the U.S.A., Chicago; and to Dr. FRANS VERDOORN, the editor of *Chronica Botanica*, for his invaluable cooperation and painstaking help so generously extended throughout the preparation of this book.

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It should be explained here that in the preparation of the transliterations into English characters of the Hebrew words referred to in most of the chapters, we came upon many variations in spelling and accentuation in the different authorities listed in the bibliography. Probably only a very few of these variations can be credited to inaccuracies in copying, typographic errors, or similar mistakes. Most of them are due to differences in Hebrew pronunciation, such as the Ashkenazi (used so widely in Europe) or Sephardic (which is the classical Palestinian) and the various intermediate dialects, and to the lack of exact equivalents of Hebrew letter-sounds in our language. In cases where we have given several transliterations for the same Hebrew word, these are the forms common in the quoted literature. They should, in most cases, be easily recognizable to Hebrew students with either a classical or an Ashkenazi background. Dr. J. C. TREVOR, in several letters to us, takes exception to many of these transliterations, stating that they are obsolete forms not generally accepted by Hebrew scholars today. He states, for instance, that today "b", "g", "d", "k", "p", and "t" are used in place of the "bh", "gh", "dh", "kh", "ph", and "th" of older writers quoted by us for the softened letters (used when they follow a vowel). Also "š" is used more frequently today than "sh". The "sh'wa" or shortest Hebrew vowel is now indicated by raising the letter (according to its color, *i.e.*, a, e, or o) slightly above the line; "aleph" is indicated by an apostrophe opened to the left; and "ayin" is indicated by an apostrophe opened to the right, as in their letter names. Dr. TREVOR's corrections have come to us too late to be incorporated in the general text of the book, but are given in part in the Supplementary Notes.

In various places in the text we have had occasion to assign approximate dates to Biblical occurrences. In this we have followed the so-called Archbishop USSHER chronology. We realize that modern Biblical scholars do not place complete reliance on this old chronology, but in view of the fact that it is still widely accepted by the general Bible-reading public, we have decided to follow it here.

THE AUTHORS

*These publishers prefer to have what we and others call the "Goodspeed Version" referred to as "The University of Chicago Version".

**These publishers prefer to have what we and others call the "O'Hara Version" referred to as "The Confraternity Edition".

*To the Memory of
John Hendley Barnhart
Botanical Bibliographer and Biographer
An unfailing Font of Knowledge
Always cheerfully shared, a thorough Scientist
Abundantly imbued with Humanity
Genial Adviser and Friend
this Book is gratefully dedicated*

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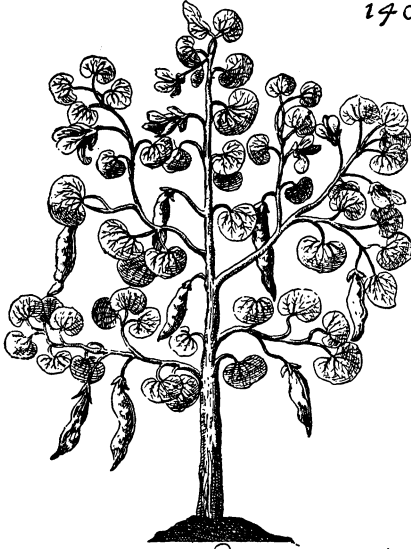
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Judas baum. *Arbor Judæ.*

140



Ein böses maud wird kein glück haben.^{2, 12}
 Der Judas baum (man mains) den nahmen trägt
 davon daß er gehend an ihm bekahm verräthers lohn:
 Also man boßheit wil der unschuld ürtheil haben,
 Zu ihren süß se selbst die grüber vffeat namben.

Adams äpfel. *Malus Assyrica.*

79

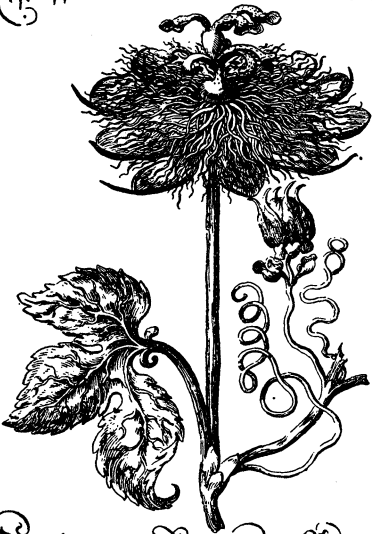


Er wird nichts in seinem sterben mitnehmen.^{2, 12}
 Der Adams äpfel hat sich selbst gemacht zum hecht
 hat Creißel, sünd und tod, und also sein geschlecht
 in untergang geführt, die armen kinder erben
 vom vatter anders nichts, als unglück, schand u. sünden.

Passionblumen.

Maracot.

22



Du legest mich in des todes staub.¹¹⁰
 Das fremde Maracot von der Natur gebrüt
 des leidens Christi süß und siegel in sich trägt:
 O Mensch! laß du dem herz der blumen auch nach-
 lass lebend in dir sein des Herren tod und nahmen.

FIGURES 2-4. — Renaissance Bibles and Biblical commentaries were often illustrated with decorative and symbolic engravings. On this page are reproduced three charming woodcuts from an old German, emblematic commentary on the Psalms, HOHBERG'S "Psalter Davids" (1680), with illustrations of plants at that time considered as very typical Bible plants. In more recent times, it has been shown that two of the three species illustrated here are not actually Bible plants, *Cercis siliquastrum*, long considered to be the tree in which Judas hanged himself, is not mentioned in the Scriptures. *Passiflora incarnata*, one of the passionflowers, is an American plant and was unknown in Biblical times, though it has been popularly supposed to be a Bible plant since 1610, because of a fancied symbolism of the Crucifixion seen in its remarkable flowers. The "Adam's Apple" (labeled "*Malus assyrica*" here) is not a true apple (cf. figs. 91, 94 and 95), nor is it the plant referred to as "apple" in the Old Testament—it appears, rather, to be the sycamore fig, *Ficus sycomorus*. (Courtesy Arnold Arboretum of Harvard University).



List of Illustrations

VIGNETTE by Professor OLLE HJORTZBERG: Moses smiting the rock in Horeb and obtaining water therefrom, as recounted in the book of Exodus. Though the rod appears somewhat generalized, it is probable that an almond branch was intended. (Swedish Bible, 1927, cf. sub fig. 9) i

HALF TITLE: In this wood engraving, GERARD JANSSEN, of Kampen, attempted to crowd, into a single picture, the leading events of the Old and New Testaments, including (on the left) MOSES receiving the Commandments, HANNAH and the infant SAMUEL, the raising of the golden serpent, the temptation of ADAM and EVE in the Garden of Eden, with the ultimate end of the Old Dispensation being death. On the right, or New Dispensation, side of the engraving are depicted the Ascension into Heaven, the angels heralding the good news of JESUS' birth, the Annunciation to MARY, the Crucifixion, ELIZABETH and the infant JOHN, and JESUS' triumph over death. In the center is the Tree of Life, green on one side, but withered and dead on the side where JUDAS has hanged himself. At its base are ISAIAH and JOHN THE BAPTIST pointing Mankind from the Old to the New Dispensation. (Frontispiece to the Flemish Bible, published by Plantin in 1566) iii

FIG. 1: *Cedrus libani*, Cedar-of-Lebanon (see also p. 64 and fig. 52) iv

HEADPIECE for the book of Genesis: The artist attempts to symbolize the Garden of Eden, with the intertwined stems of the fig, pomegranate, and the vine, and prancing deer indicating the fruitfulness of the earth. At the lower left is a symbolic representation of the all-seeing eye of God watching over the earth. (Swedish Bible, 1927, cf. sub fig. 9) vii

HEADPIECE: The Good Shepherd, bearing the Lost Sheep on his shoulders and carrying

the symbolic shepherd's staff. With him are four figures representing the four seasons, symbolic of the shortness of life. (After a painting in the crypt of St. Calixtus, Roman catacombs), this headpiece, as well as the vignettes on p. 11, 15, DDD, and at the end of the book, have been drawn by Mrs. MARTHA KOTELES from tracings reproduced in LOUISE TWINING, Symbols and Emblems of Early and Mediaeval Christian Art, 1852 xi

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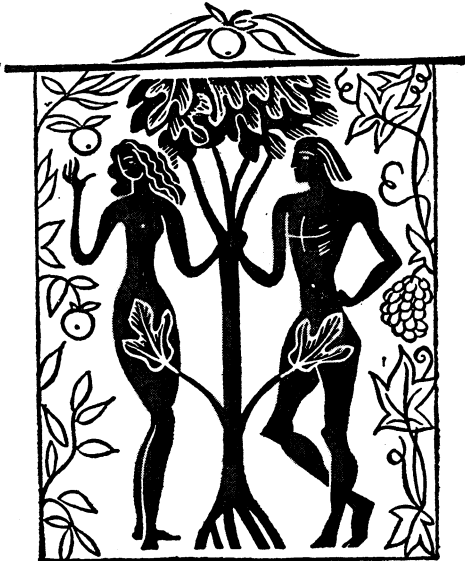
TAILPIECE: An artist's attempt to portray the "good" and the "corrupt" trees described in MATTHEW. The good tree is distinguished by its flourishing leaves and by the lamps, signifying good deeds, suspended from its branches. The corrupt tree has bare branches and the feller's ax already is buried in its trunk. (After sculpture in the Cathedral of Amiens) 11

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INITIAL used by the Plantin Press 13



FIGURES 5-8.— Three representations of the Temptation in the Garden of Eden, a favorite subject through the ages. The Tree of Knowledge has sometimes been depicted as a fig tree, sometimes as a citron, sometimes as a mountain-ash, but most often as an apple (as in figs. 91, 94 and 95). Fig. 5 is from the typographically famous "Methodus Primum Olimpiade" (published in Basel, 1504), in fig. 6, a Renaissance woodcut, the skeleton tree bears fruits which look like citrons or pomelos. In fig. 7 the central tree is obviously a fig, to the right of which is a grape vine and to the left apples (from a modern advertisement, designed by JOHN FARLEIGH, for the British Brewers' Society).—Fig. 8, a fine, contemporary drawing by JOSEPH SCHARL for a series of interpretations of the Old and New Testament, symbolizes King SOLOMON and his Beloved enjoying the manifold blessings of an Eden-like paradise, possibly his own famous garden.—See also p. 329, fig. 91 and fig. 95.



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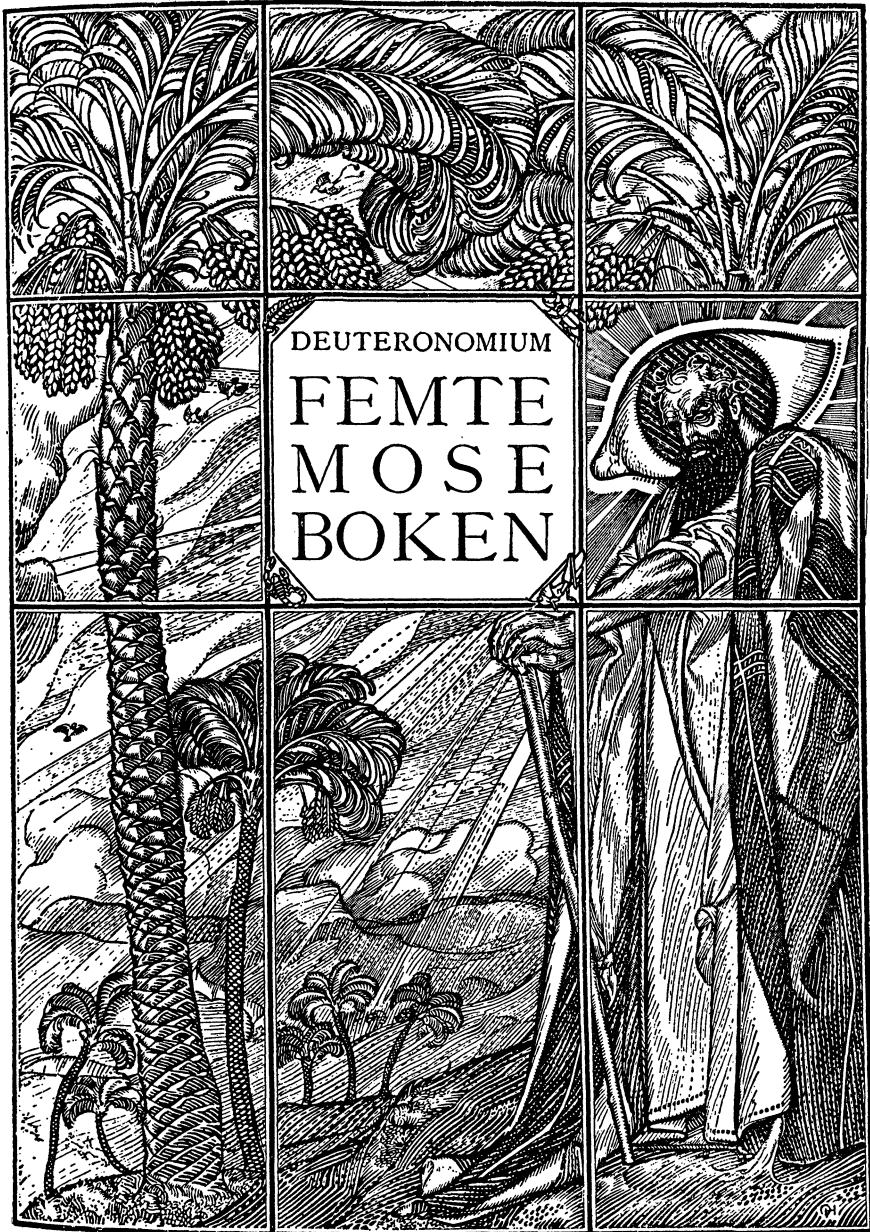


FIGURE 9. — The large Swedish Family and Pulpit Bible, published in 1927 by A. B. Nordisk Familjeboks Bibelförlag in Stockholm, Sweden, an unusually fine typographical accomplishment, is also unique in being one of the very few modern Bibles illustrated with, in general, quite accurate as well as highly ornamental and artistic drawings of various Bible plants by Professor OLLE HJORTZBERG. We reproduce this title page for the book of Deuteronomy, wherein the distinguished artist has depicted the aged Moses describing the Promised Land, rich in blessings, into which he himself could not take his people, but which he commanded them to "go up and possess it". The date palms (see also fig. 28, fig. 70, and fig. 92) in the drawing are heavy with fruit symbolizing the fruitfulness of the land.

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HERBARVM

ATQVE ARBORVM QVÆ

IN BIBLIIS PASSIM. OBVIÆ
sunt, & ex quibus sacri vates similitudines de-
sumunt, ac collationes rebus accommodant, di-
lucida explicatio: in qua narratione singula lo-
ca explanantur, quibus Prophetæ obserua-
ta stirpium natura, conciones suas il-
lustrant, diuinaq; oracula ful-
ciunt, LIVINO LEMNIO Sacra-
rum Literarum stu-

dioso autore,
In v. s. h. h. copuzurum Livinij in



ANTVERPIÆ

Apud Gulielmum Simonem
sub scuto Basileensi.

1566.

Cum Privilegio.

EXIMIO SVM-

MÆQVE VIRTVTIS

AC DIGNITATIS VIRO

D. THOMÆ THIELDIO DIVI

Bernardi in confinij Antuerpianis

ad Scaldam, Antistiti cum primis

reuerendo Liuinus Lemnius

Medicus Zirizæus sacra-

rum literarum stu-

diosus.

S. P. D.



QVVM mihi nuper am-
plissimè de prædicaret virtu-
tis tuæ decus, & mentis
præstantiam, Antistes spe-
tatisime, Iacobus Susius vir, præter anti-
quæ nobilitatis insignia, omni disciplina-
rum genere excultissimus: cæpit ilico ani-
mus noster in tui nominis amorem ac vene-
rationem incitari. Quis enim erga illum non
afficiatur? qui in pacificandis optimatum
dissidijs, in dirimendis sopiendisq; controuer-

A 2 sjs

OMNIA

SERIO



FIGURES 10-12. — Facsimile reproductions of three pages from the first book ever published on the plants of the Holy Scriptures. This was a 161-page work, published in Antwerp in 1566, by LEVINUS LEMMENS (1505-1568), a Dutch physician of Zierikzee, a friend of DODOENS and GESSNER. Shown are the title-page, the author's portrait given on the back of the title-page, and the first page of preface. Early works on the subject, like this one, depended almost entirely on the evidence furnished by comparative philology, etymology, the opinions of the "Church Fathers", and the "internal evidence" of the Scriptures themselves. Not until 1757 was botanical evidence brought to bear on the subject—and this was long after some of the Bible versions now in most general use were formulated. (Courtesy Arnold Arboretum of Harvard University).

Historical Sketch



POPULAR INTEREST IN THE BOTANY OF THE BIBLE DATES FROM VERY EARLY TIMES. PLANTS AND PLANT PRODUCTS ARE REFERRED TO IN SO MANY HUNDREDS OF VERSES OF BOTH THE OLD AND NEW TESTAMENTS, AS WELL AS IN THE BOOKS OF THE APOCRYPHA, THAT IT IS NOT AT ALL SURPRISING TO FIND EARLY THEOLOGIANS, DIVINES, AND SCHOLARS EXCEEDINGLY INTERESTED IN THEM. THEOLOGICAL LITERATURE, FROM ITS VERY BEGINNINGS, IS FILLED WITH REFERENCES TO AND COMMENTS UPON THE PLANTS OF THE BIBLE AND OF BIBLICAL LANDS. THERE WAS, OF COURSE, A LONG PERIOD OF TIME WHEN NO ONE DARED TO CHALLENGE ANY OF THE TRANSLATIONS OR INTERPRETATIONS OF BIBLICAL PASSAGES BY THE LEADERS OF THE CHURCH THEN IN AUTHORITY. THE TIME CAME, HOWEVER, WHEN QUESTIONS WERE ASKED AND

various sects or denominations appeared—at first persecuted and suppressed as “heretics”. Translations were questioned and even the canonicity of some of the chapters and of entire books was challenged. There naturally followed heated and often bitter discussions and arguments among scholars and theologians concerning the translation and interpretation of certain Hebrew or Greek words or phrases in the various passages referring to, or thought to refer to, plants or plant products. No attempt has been made by us to review the huge theological literature on this subject, or to list it in our bibliography, primarily because these writers were not botanically trained and their arguments, while in many cases interesting to read, are largely metaphysical, philosophical, moralistic, or philological in nature.

Passing over the incidental—though none the less important—contributions to the subject made by ARISTOTLE, PLATO, PLINY, DIOSCORIDES, HERODOTUS, THEOPHRASTUS, and even PLUTARCH and JOSEPHUS, we find that the first book (of which we have a record) that dealt entirely with the plants mentioned in the Scriptures was that of LEVINUS LEMMENS in 1566 (206). This was a 161-page work with the imposing title of “Herbarum atque arborum quae in Bibliis passim obviae sunt et ex quibus sacri vates similitudines desumunt, ac collationes rebus accommodant, dilucida explicatio; in qua narratione singula loca explanantur quibus Prophetiae observata stirpium natura, conciones suas illustrant, divina oracula fulciunt.” It was reissued, in 1568, with another title, as “Similitudinum ac parabolarum quae in Bibliis ex herbis atque arboribus desumuntur dilucida explicatio . . .” Then followed THOMAS NEWTON’S “An herbal for the Bible” in 1587, with 287 pages, which was actually only a translation, albeit with alterations, of LEMMENS’ work. The only other noteworthy contribution to the subject in the 16th century was F. VALLES’ “De iis, quae scripta sunt physice in Libris Sacris; sive, de sacre philosophia”—a 978-page work first issued in the year 1588.

The 17th century was ushered in by L. RUMETIUS’ “Sacrorum Bibliorum arboretum morale”, with 118 pages, published in 1606, but later (in 1626) expanded into a 3-volume and 901-page work, and by CLEMENS ANOMOEUS’ “Sacrorum arborum, fruticum et herbarum”, in 1609, with 223 pages. These were followed by a Portuguese work of 582 pages in 1622 by F. I. DE BARREIRA, by JOHANNES MEURS’ “Arboretum sacrum” in 1642, and by A. COCQUIUS’ two books—“Historia ac contemplatio sacra plantarum arborum & herbarum quarum fit mentio in Sacra Scriptura” in 1664 and his “Observationes et exercitationes philologico-physiologicae” in 1671. E. CASTELLI produced in 1667 a book on the plants mentioned in the Bible, and there were smaller tracts on various single plants by DU PAS (lily of the field), MUNDELSTRUP (apple of Sodom), RAVIUS (mandrake), and MEYER (sycomore). In 1663 the first of the many editions of J. H. URSINUS’ extremely popular 638-page

“Arboretum biblicum” was printed, to be followed, in 1694, by the “Scripture herbal” of WILLIAM WESTMACOTT.

In the 18th century there appeared the numerous and very important works of CELSIUS, HILLER, SCHEUCHZER, SHAW, OEDMAN, HARRIS, and TAYLOR. In the year 1740 the first edition of J. B. ROHR’s “Phytotheologia” was published, and, in 1745 and 1747, the two volumes of CELSIUS’ “Hierobotanicon”. The latter are usually regarded as being among the foundation-stones of this study.

There is no other branch of botany in which so very many persons have spoken, argued, and written without ever bothering to investigate the controversial matters by direct observation,—in other words, without applying the scientific method! It seemed entirely unnecessary—and even irrelevant—to these older writers, chiefly theologians, divines, and classical scholars, to inquire as to what plants actually were growing in Biblical lands in their day. Even scholars with a fair knowledge of natural history were slow to realize that the plants of one region might differ considerably from those of another region. For centuries scholars and even herbalists attempted to identify in Germany, France, England, or Scandinavia the plants described by THEOPHRASTUS or DIOSCORIDES from Greece. That a plant described from Greece might not be also native to Sweden or England or South Africa apparently never occurred to these writers. Conversely, for centuries herbalists searched the writings of the ancient Greeks, Romans, and Arabs for descriptions of the wayside plants of Great Britain and Holland, rarely, if ever, realizing the futility of their task! So it is not surprising that most of the early writers on the plants of the Bible should have based the greater portion or even all of their arguments on such lines of evidence as furnished by comparative philology, etymology, the opinions of the “Church Fathers”, and the “internal evidence” of the Scriptures themselves. That they should have arrived by these means at various often extremely divergent and in not a few cases completely erroneous conclusions was inevitable. KITTO has quite aptly summed up the situation in the following words: “The Natural Histories of the Bible form a class by themselves, having less connexion than any other with the science of nature. They are rather works of criticism than of natural history—rather the production of philologists than of natural historians. Whatever learning could do on such subjects has been done; and whatever might be done by science, observation, and well directed research has been left undone. The process usually taken in works of this class has been to exhaust the resources of philology and conjecture in the attempt to discover the meaning of the Hebrew name and the object denoted by it. From the very nature of the thing, the conclusion arrived at is often unsatisfactory or uncertain. But a conclusion being taken, the ancient writers of Greece and Rome are ransacked to supply this history and description of the object, and in particular to furnish such intimations as may coincide with or illustrate those of the sacred writers. All this was very proper; but the value of the information thus collected as *contributory* to a Natural History of Palestine might have been very greatly enhanced had corroborations and elucidations been sought in the *actual* condition of the country, and the character of its products in the various departments of nature” (202).

In 1757 the “Immortal Swede”, CAROLUS LINNAEUS, edited and published the “Iter palaestinum” (160) of his lamented student and devoted follower, F. HASSELQUIST. This 619-page work was immediately translated, by command of the Queen of Sweden, into German, English, and French. The English edition is entitled “Voyages and travels in the Levant in the years 1749, 50, 51, 52: containing observations in natural history, physick, agriculture, and commerce: particularly in the Holy Land and the natural history of the Scriptures”. This book marks the beginning of an entirely new epoch in the study of the plants of the Bible. LINNAEUS himself in the introduction to the book says: “In one of my botanical lectures in 1747 I enumerated the countries of which we knew the natural history and those of which we were ignorant. Among the latter was Palestine: with this we were less acquainted than with the remotest parts of India; and although the natural history of this remarkable country was most necessary for divines and writers on the Scriptures,

who have used their greatest endeavours to know the animals therein mentioned, yet they could not with any degree of certainty determine which they were before someone had been in the country and informed himself of its natural history" (162).

Impressed by this lament of LINNÆUS in 1747, his student, HASSELQUIST, though weak and delicate in health, undertook two years later a journey to Egypt and Palestine. He succeeded in exploring a large part of the Holy Land and in making extensive notes and collections for shipment back to Sweden, but the excessive heat of Palestine proved too much for him and he died in Smyrna at the age of 31—"wasting away", as his great tutor and biographer laments, "like a lamp whose oil is spent." But the results of HASSELQUIST'S investigations—the first to be made by a qualified naturalist in that area—were given to the world by LINNÆUS in 1757. Imperfect though this work is because of the short time that HASSELQUIST had in Palestine before he succumbed, it is still one of the most valuable books ever written on the subject. It marks the beginning of a new era because now for the first time in history a writer on the natural history of the Bible had actually visited Biblical lands and had there studied firsthand the natural features of the region. The writings of all previous workers, including LEMMENS, URSINUS, SHAW, and even CELSIUS—friend and patron of LINNÆUS—were based on hearsay and suppositions, often quite erroneous. Beginning with HASSELQUIST at least some of the writers on Biblical natural history based their arguments and commentaries on actual observations rather than on mere suppositions, assumptions, and linguistic maneuverings.

HASSELQUIST was followed in the exploration of Biblical lands by another ill-starred naturalist, PEHR FORSKÅL, who traveled in and explored Egypt, Arabia, and the regions about the Red Sea. Misfortune and hard luck dogged his footsteps. His body wracked by diseases, attacked repeatedly by robbers and bandits who once stripped him of all his worldly possessions save only his pressed plant specimens which they spurned as "worthless", his misfortunes came to a climax when his guides and carriers deserted him in the midst of the Arabian desert and he was left to die of hunger and thirst. But in 1775 and 1776, after his untimely death, the results of his brave pioneering were published by C. NIEBUHR. One 164-page volume described the mammals, birds, fish, insects, amphibians, worms, and materia medica of the region (121); another volume, of 377 pages, described the plants (122). So, thanks to the self-sacrificial labors of HASSELQUIST and FORSKÅL, both of whom paid with their life's blood, the world was finally given a firsthand description of at least some of the plants and animals of Biblical lands.

It is astonishing to note how slow botanists were to follow up the work of these two pioneers, and to explore intensively the Holy Land. In spite of the unnaturally truncated work of HASSELQUIST and FORSKÅL, the lament of LINNÆUS held true for an unbelievably long time, during which far more was learned and was known of vastly more distant and isolated lands than was known of Palestine and its surrounding countries. In 1863 a writer in the "London Quarterly Review" (301) tells of visiting the great British Museum of natural history in South Kensington and of finding there specimens of plants and animals of all the rest of the world in great abundance, but scarcely any at all from Palestine! Even today this singular dearth of material from the Holy Land in our leading museums and herbaria is most noticeable, and, to the student of the plants of the Bible, most deplorable.

The books of URSINUS are typical of that class of publications on the natural history of the Bible described so fitly by KITTO. URSINUS gives diagrammatic illustrations, often laughable in their inaccuracy, of the more important plants, and brief descriptions, culled mostly from the old Greek and Roman natural history writers, but goes deeply into the linguistic origins of their names, considering the original Hebrew and Greek texts. In 1793 the first edition of T. M. HARRIS' 297-page "The natural history of the Bible" appeared. The great botanist, C. P. THUNBERG, in 1828, published nine dissertations on the plants of the Bible, entitled "Afhandling om de växter,

som i Bibelon omtales" (321). KITTO's splendid work on "Palestine: the physical geography and natural history of the Holy Land" was printed in 1841. Very frequently cited is MARIE CALLCOTT's famous "Scripture herbal", on whose 568 pages, in 1842, was brought together most of the pertinent information assembled by all the previous authors on this subject. PRATT's "Plants and trees of Scripture", which made its appearance, unsigned, in 1851, is well worthy of mention, as is also J. H. BALFOUR's "The plants of the Bible" of 1857. Canon TRISTRAM's "Natural history of the Bible"—a 524-page work whose first edition appeared in 1867—is very frequently quoted especially in Biblical commentaries and theological works. We have personally found the volume by the distinguished Kew botanist, JOHN SMITH, entitled "Bible plants, their history", of 265 pages, published in 1878, extremely useful, and it will be cited hundreds of times on the following pages. In the decade of 1883 to 1893 the first edition of G. E. POST's monumental "Flora of Syria, Palestine, and Sinai" was published. In 1932—1933 a second edition of this work appeared. It is still the only comprehensive and authoritative flora that we have for this most important and fascinating part of the earth's surface. The work of W. H. GROSER, entitled "Scriptural natural history. I. Trees and plants mentioned in the Bible", first issued in 1888, is a fine and handy book. In 1928 and 1929 an interesting series of articles by A. BORAH on the trees of the Bible appeared in "American Forests & Forest Life". Several authors have written on Biblical botany in the "Gardeners' Chronicle", while as late as 1934 a stimulating paper on "Flowers of the Bible" appeared in "Nature Magazine".

Thus we see that interest in the subject has remained keen right down to the present day. In fact, there is at present a professor of Biblical botany at the Hebrew University of Jerusalem, where intensive research is being carried on in this subject. It is confidently expected that much valuable light will be shed on the plants of the Bible by Dr. HA-REUBENI, his students, and his successors. Further evidence of the continued popular appeal of this branch of botany is seen in the fact that so many of the better books on this subject were reprinted in 2, 3, 4, or more editions, and some translated into several languages. The edition of our own previous work on the subject in 1940 (233) was quickly exhausted. This led to the publication by Miss E. A. KING and Miss C. H. WOODWARD of their résumé in the "Journal of the New York Botanical Garden" (192, 347) and to Miss KING's volume on "Bible plants for American gardens" in 1941 (187). These works, too, were soon out of print. The two former were reprinted twice and another edition is now under way. Realizing the popularity of the topic, the New York Botanical Garden made it the subject of its annual entry at the International Flower Show held at Grand Central Palace, New York City, in March, 1941, where it proved to be the cynosure of all eyes and where it won a first prize gold medal award. Since then the Garden has many times reconstructed the scene of the Nativity at Bethlehem in one of its display greenhouses during the Christmas season, with only authentic Bible plants used in the scenery. That these exhibits have captured the public imagination and interest is attested by the huge crowds which invariably visit them and by the long series of newspaper, magazine, and church paper notices cited in our bibliography (318, 348-372), which, in fact, is only a very partial listing of the more important notices which happen to have come to our attention. Letters have poured into the Garden from every section of the United States and Canada, and from several foreign countries, on this subject. At present there are at least two Biblical gardens established by churches in the West, and a well-known architect plans to offer special designs for gardens of Biblical plants for churches, synagogues, and other religious institutions such as monasteries, convents, and theological seminaries. Several persons have written to us of their intentions to establish Biblical gardens in their towns, similar to the Shakespeare gardens which have been so popular.

One of the most frequent errors into which the non-botanically trained preachers and theological writers have fallen in the past—and, surprisingly, continue to fall even at the present time—is that of identifying the plants of

the Scriptures with plants growing naturally in the regions in which these men or women happen to be living—France, Germany, England, Scotland, the United States, Canada, etc. This error was understandable and forgivable in the distant past, before the days of LINNÆUS, HASSELQUIST, and FORSKAL, because in those days few persons except soldiers traveled extensively and hardly anyone realized the great differences that exist in the floras of various lands. To LINNÆUS, among many other things, goes the credit for proving and emphasizing the fact that floras and faunas differ from place to place, depending on climate, soils, natural barriers, latitude and longitude, etc. Even he had not realized this until after his trip to Lapland. Yet this is now such a common piece of general knowledge that it seems unbelievable that preachers should continue to identify the “elm”, “sycamore”, “lily”, “rose”, “vine”, etc., of the Scriptures with plants bearing these names in our own American woods and fields! And yet this has been done very extensively and is still being done today, much to the amusement of the botanist. Another common error of the non-botanist who visits the Holy Land today is the supposition that all the plants which he sees there now were naturally there in ancient Biblical days, or that he must find there now the plants referred to in the Bible as having been there then. Both of these suppositions are fallacious, since they fail to take into account that fact that floras change, especially in regions like Palestine and Egypt where man, notorious for his aptitude in upsetting the delicately adjusted balances in nature, has been most active, in one way or another, for at least 6000 years. Many plants now extremely common in the Holy Land were definitely *not* there in Biblical days. Many examples might be mentioned, but outstanding are the American locust, *Robinia pseudo-acacia* L., which has been introduced into Palestine only rather recently, but is thriving and spreading there now as well as it does in its native land, and the American pricklypear cactus, *Opuntia ficus-indica* (L.) Mill., which was introduced some time ago and has found Palestine so favorable to its growth that it is now found “everywhere” (266) and is one of the conspicuous and distinctive features of the landscape. So characteristic is it now that artists who make Biblical pictures have time and again fallen into the ridiculous error of painting some episode in the life of JESUS or of one of the Old Testament characters, showing the surrounding landscape filled with cactus plants in flower or fruit! Every botanist, of course, knows that no *Opuntia* cacti were known anywhere in the Old World until after the discovery and exploration of America and their subsequent introduction from America. Similarly, the opopanax, *Vachellia farnesiana* (L.) Wight & Arn., is now found all through the Levant in hedges and along watercourses, but is an American plant. Again, the white mulberry, *Morus alba* L., is now cultivated “everywhere” (267) in the Holy Land and one might be led to assume that it was the mulberry of the Bible. However, *M. alba* is a native of China, and it is fairly certain that trade had not yet been established with China in Biblical days, so it could not have been in the Holy Land in those days. The same is true of the weeping willow, *Salix babylonica* L., now widely cultivated and escaped in Palestine, but actually a native of Japan or China. It could not have been known to the Biblical children of Israel. Similarly, the badly-named rose-of-Sharon (*Hibiscus syriacus* L.), the soapwort (*Saponaria officinalis* L.), and many species of *Citrus* are now common in the Holy Land due to recent introduction. Hundreds of other exotic plants exist at present in Syria, Lebanon, and Palestine which were certainly not there in Biblical days, and many of these are now escaping into the countryside and grow like natives. There is even a legend that the blue vervain, *Verbena hastata* L., grew at the foot of the cross when JESUS was crucified, but this, again, is impossible since that species is confined to portions of the United States and Canada. ERG lists 115 plant species as endemic to Palestine and has computed that they comprise only about one quarter of all plants there today (119). How different the plant life of Biblical Palestine must have been from that of the present time!

The complications which this introduction of exotic species into Palestine has brought about is well illustrated by a passage in Dr. J. C. GEIKIE'S “Life

and Words of Christ" where the present mixture of native and exotic species in the flora as observed through the eyes of a non-botanist is dramatically pictured: "Within the extent of a single landscape, there is every climate, from the cold of Northern Europe to the heat of India. The oak, the pine, the walnut, the maple, the juniper, the alder, the poplar, the willow, the ash, the ivy, and the hawthorn, grow luxuriantly on the heights of Hermon, Bashan, and Galilee. Hence the traveller from the more northerly temperate lands finds himself, in some parts, surrounded by the trees and vegetation of his own country. He sees the apple, the pear, and the plum, and rejoices to meet the familiar wheat and barley, the peas, potatoes, cabbage, carrots, lettuce, endive, and mustard. The Englishman is delighted to find himself surrounded by many of the flowers of his native land; for out of the 2,000 or 2,500 flowers of Palestine, perhaps 500 are British. It looks like home to see the anemony, ranunculus, yellow water-lily, tulip, crocus, and hyacinth, the mignonette, geraniums, mallows, the common bramble, the dog-rose, the daisy, the well-known groundsel, the dandelion,—sage, thyme, and sweet marjoram, blue and white pimpernel, cyclamens, vervain, mint, horehound, road-way nettles, and thistles; and ponds with the wonted water-cress, duckweed, and rushes.

"The traveller from more southern countries is no less at home; for from whatever part he comes, be it sunny Spain or Western India, he will recognize well-known forms in one or the other of such a list as the carob, the oleander and willow skirting the streams and water-courses; the sycamore, the fig, the olive, the date-palm, the pride of India, the pistachio, the tamarisk, the acacia, and the tall tropical grasses and reeds; or in such fruits as the date, the pomegranate, the vine, the orange, the shaddock, the lime, the banana, the almond, and the prickly-pear. The sight of fields of cotton, millet, rice, sugar-cane, maize, or even of Indian indigo, and of patches of melons, gourds, pumpkins, tobacco, yam, sweet potato, and other southern or tropical field or garden crops, will carry him back in thought to his home (128a)."

There is, however, another side to the picture. Many plants which grew in abundance in the Holy Land or surrounding countries in Biblical days are now no longer found there or else grow in far smaller numbers. Some have been driven out by foreign, more weedy invaders, much as the native vegetation in many parts of America is being driven out by European or Asiatic weeds. Others of the native Palestinian plants have been exterminated or almost exterminated by the over-cultivation of the land, the destruction of the forests, and the resulting changes in climatic and other environmental conditions. If we stop a moment to recall the vast changes which have occurred in the American Middle West due to the cultivation of the land over the past 75 years, and then recall that the Palestine area has been under cultivation continuously for the past 3000 or 4000 years, we may obtain a fair idea of the changes that must have taken place there. At one time Palestine was a land of palm trees, with the date-palm as abundant and characteristic there as it was in Egypt. This we know not only from the testimony of early historians, but also from the abundant fossil remains of palm trunks buried in the shifting sands. Now the date-palm must be carefully cultivated there. In Biblical days the towering cedars clothed the slopes of the Lebanon and other mountain ranges. Now the few remaining specimens must be carefully fenced in and protected by the government, lest the species be completely exterminated in its own homeland.

Anyone delving even very superficially into the literature of Bible plants will be impressed at once by the amazing discrepancies, contradictions, palpable mis-identifications, erroneous statements, and general confusion which exist there. The reasons for this lamentable confusion are several. First, it must be remembered that the exact science of botany, as such, is a very recent development in human knowledge. It is true that men were always concerned with and interested in the plants about them, but this interest could hardly be termed as anything approaching an exact science until quite recently in man's history. Certainly during the days when the books of the Bible, especially those of the Old Testament, were composed and later recorded, there was no such thing as an exact science of botany or botanical nomenclature, hence

exactness and accuracy of terminology were impossible. Secondly, the writers of the books of the Bible were not botanists or even "natural historians" (with, perhaps, one possible exception). Mostly they were very plain men, with a limited vocabulary. Nor was the purpose of their writing botanical. The Bible was not intended by its writers to serve as a textbook of natural history. To the writers of the Scriptures the botanical aspects were strictly secondary and subservient to the moral, ethical, theological, and historical aspects, which were to them of far greater importance and significance. Thus it would be more surprising to *find* accuracy in botanical matters than *not* to find it. Thirdly, one must keep in mind the history of the Scriptures. It is generally agreed by students of the subject (102) that much of the material of the Old Testament originated in the form of poetry—songs and ballads, or what we now call folksongs—handed down from generation to generation of bards and singers for many hundreds of years before ever they were written down; indeed, in some cases, before ever written language was invented. It is thought that the so-called "Books of the Law" (Pentateuch, Torah), the events recorded in which are purported to have covered the period of 4004-1451 B.C. in the USSHER chronology, were not actually completed in written form until about 444 B.C.; the "Prophets" (Nebi'im) at about 250 B.C.; and the remaining books of the Old Testament or "Sacred Writings" (Ketubim) and poetical books at about 150-100 B.C. The Hexateuch (Genesis to Joshua) was probably written in part, by many different scribes, with more constantly added, in the 10th or 9th centuries B.C. In such a situation as this, with much of the material existing for hundreds of years merely as folksongs or ballads, then written down in part by various writers, at various dates, and mostly long after the events described, it is not surprising that confusion of terminology should result, along with probable mis-identifications, the use of different words for the same plant and of the same word for different plants, even in the "original" texts.

Fourthly, one must remember that even after the books of the Bible were once recorded in written form, they were still subject to much possible change. The Hebrew Bible was first translated into the Greek between the 3rd and 1st centuries B. C., while it was the Reformers, much later, who separated the books which had no Hebrew original into the Apocrypha. The oldest Hebrew text of the Bible now known to us is the Masoretic text, which may have been written between the 6th and 8th centuries A. D., although no less an authority than GOODSPEED and others of similar merit say not until the 9th century (5). It is probable, although not at all certain, that it became fixed at about the 2nd century A. D. After that time it was copied and recopied by lonely monks in the solitude of their cloistered monastery cells. This copying was undoubtedly done very faithfully and religiously, by persons to whom every "jot and tittle" was sacred, and so it can be rather safely assumed that no more than a very few purely accidental changes crept in during that time (8). This leaves, however, a tremendous period of years between the time when it was first written down (from the 10th century B. C.) to the time when it became fixed (in the 2nd century A. D.), during which errors, corruptions, and accidental or intentional additions or subtractions, and various other modifications could have and probably did creep into the texts (10, 11, 12). And then there was before that the vastly much longer period of time during which the material was handed down by singers and bards, by word of mouth, from generation to generation, much as the folklore of any nation or race. The changes that must have occurred then can only be imagined.

The Masoretic text has also been subject to many "editions" and translations, among the more important of which are the Samaritan (written in the ancient Hebrew or Ibrî, the so-called Samaritan character, in the 1st or 2nd century A. D.), those of AQUILA, SYMMACHUS, THEODOTIUS, ORIGEN, HESYCHUS, and LUCIAN, all thought to date back to about the 2nd century, the various uncial editions of the Septuagint of the 4th to 7th centuries and the later cursive editions of the 10th to 14th centuries, the Vulgate or Latin translation of JEROME, thought to date to the 2nd century, and the Chaldee

versions (or Targums) of about the 2nd to 4th centuries A. D. (306). There have also been various Egyptian versions (of the 3rd and 4th centuries, including the so-called Memphitic or Coptic, Thebaic, and Bashmuric or Ammonian), as well as Ethiopian and Syriac (of the 4th century), Armenian (5th century), Gothic (6th century), Slavonic (9th century), and Arabic (10th century) versions. According to the American Bible Society, the Bible has at present been translated into 1118 different languages and dialects! It must be remembered in this connection that it is humanly impossible ever to make a translation from one language to another and still express *exactly* the same meaning. There are shades of meaning and connotations in every language which it is impossible to translate accurately into any other language. Thus, every time a translation into a new language is made, something of the original is lost, or something is added. And if translations are made one from the other in a linear series, instead of in each case from the "original" texts, these differences in meaning become ever greater. And the "original" texts are not always available to translators. In fact, it is relevant to point out here that many of the older versions and translations were made without recourse to "original" texts now available. On the other hand, many ancient texts then available have since been lost. All of this helps to explain some of the confusion which exists. In this connection a statement from the preface of the Jewish Publication Society's revision of 1946 is worth quoting: "The historic necessity for translation was repeated with all the great changes in Israel's career. It is enough to point to the Septuagint, or the Greek translation of the Scriptures, the product of Israel's contact with the Hellenistic civilization dominating the world at that time; to the Arabic translation by the Gaon Saadya, when the great majority of the Jewish people came under the sceptre of Mohammedan rulers; and the German translation by MENDELSSOHN and his school, at the dawn of a new epoch, which brought the Jews in Europe, most of whom spoke a German dialect, into closer contact with their neighbours. These translations are all historical products intimately connected with Israel's wanderings among the nations and with the great events of mankind in general.

"Ancient and continuous as this task of translation was, it would be a mistake to think that there were no misgivings about it. At least it is certain that opinions were divided as to the desirability of such undertakings. While PHILO and his Alexandrian coreligionists looked upon the translation of the Seventy as a work of inspired men, the Palestinian Rabbis subsequently considered the day on which the Septuagint was completed as one of the most unfortunate in Israel's history, seeing that the Torah could never be adequately translated. And there are indications enough that the consequences of such translations were not all of a desirable nature" (16).

Careful comparison of these many editions and versions reveals numerous differences. This holds for the botanical aspects as well as for any other, as will be abundantly illustrated on the following pages. Each time that it was translated the text was subjected to editorial criticism—"editing", as it were—and the opinions of the various editors have frequently changed the meaning of the original texts. The early vernacular translations were mostly translations, not of the original texts, but of 4th century Latin versions, which, for all their merits, were in turn based on totally inadequate knowledge of the original sources (10). In 1611 the English version known as the Authorized Version of King James I was completed, and to this, again, with all its merits, we owe much of the confusion regarding the plants of the Bible which has misled writers from that day to this. It was the Authorized Version which perpetuated, and, indeed, in some cases, originated, the mis-identification of Biblical plants with common English ones. It is most unfortunate that botanical knowledge was not in a more advanced stage at the time that this version was undertaken, for in this almost universally-used version among Protestants for the past 336 years aspens are called "mulberries", mulberries are called "sycamine", a species of fig is called "sycamore", the eaglewood is called "aloes", the acanthus is referred to as a "nettle", the almond becomes a "hazel", the juniper is called a "heath", the dill is called "anise", the apricot becomes an

“apple”, the box is called “ivory”, the cypress is called “box”, the saltwort is referred to as “mallows”, the terebinth becomes an “elm”, and the planetree becomes a “chestnut”! Similarly, in the field of zoology, the antelope is called a “wild ox”, the bull a “unicorn”, the hippopotamus a “behemoth”, hyenas are “doleful creatures”, the jackal is called “fox” and “dragon”, the pelican is a “cormorant”, the goose is referred to as a “fatted fowl”, the buzzard is called “glede”, the lämmergeier is called “ossifrage”, ostriches are called “owls”, the crane becomes a “swallow”, the crocodile is called a “whale”, “leviathan”, and “dragon”, locusts are called “palmerworms”, and sea-cows become “badgers”!

The King James Version, however, was not the only “authorized” English version. There were others by WYCLIFFE (14th century), TYNDALE (1525), COVERDALE (1535), MATTHEW (1537), TAVERNER (1539), and CRANMER (1539), as well as the so-called Geneva Bible of WHITTINGHAM (1557 and 1560)—the Bible adopted by the Puritans and the first to omit the entire Apocrypha. Later appeared the Bishops’ Bible of 1568 and 1572. LUTHER’S Bible appeared first as the “Septemberbibel”, which was a New Testament translation dated September 1522 at Wittenberg. The title page was without any date or publisher’s name. The Zurich Bible appeared in 1530, a German version, which consisted of LUTHER’S translation and the addition of the Prophets and the Apocrypha. The Berleburg Bible (1726-42) was a German translation based on the two preceding ones and illustrating mystical tendencies. In 1735 the WERTHEIM Bible, a German rationalistic version, was published by WERTHEIM. The Probe-Bibel or Proof Bible (1892) is the revision of LUTHER’S Bible as ordered by the Eisenach German Protestant Church Congress.

GREGORY MARTIN’S Rheims and Douay Bible of 1582 and 1609, became the official English Catholic version. Both the Geneva and the Douay versions added to the texts notes (political as well as theological) of highly controversial nature (306). The Douay version was revised by Bishop CHALLONER in the middle of the 18th century.

The MAZARIN Bible, GUTENBERG Bible, or Bible of Forty-two Lines, an edition of the Vulgate printed at Metz about 1450-55 by GUTENBERG and others, was the first Bible, and probably the first complete book, printed with movable type. It derives one of its names from being found about 1760 in the library of MAZARIN. The Bible of Thirty-six Lines, a folio edition of the Biblia Latina, is so-called because of the page format of two columns having thirty-six lines. It is also called the Bamberg Bible because that was probably its place of printing in 1460.

The Leopolda Bible (1561) was a Polish translation by JOHN OF LEMBERG from the Vulgate. It was published at Cracow. It was intended for Roman Catholic use, but was not sanctioned by the Pope.

The St. Wenceslaus or Wenzel Bible was published at Prague for Bohemian Roman Catholics by the Jesuits (1677-1715).

WUYECK’S or WUJEK’S Bible is the Authorized Polish Roman Catholic version made by the Jesuit WUJEK and published at Cracow—New Testament 1593—Old Testament 1599.

The Bible of Ferrara (1553) was the first edition of the Old Testament in Spanish by DUARTE PIVEL, and was made directly from the Hebrew expressly for the Jews. Another edition appeared in the same year for Christians.

PFISTER’S Bible was so-called because it was printed by ALBERT PFISTER. SCHELHORN’S Bible was so-called because it was described by SCHELHORN in 1760.

The Kralitz or Brothers’ Bible is the most important Bohemian version published by the United Brethren at Kralitz in Moravia (1579-93).

The Ostrog Bible is the first complete Bible printed in Slavonic. It was printed in Ostrog in 1581.

Of the many other editions there are those whose chief importance is derived from some peculiarity of or mistake in printing or translation such as:

Chained Bible (1539) for the Great Bible of CRANMER since it was often chained in churches for public reading.

Bug Bible (1551) reading in Psalm 91:5 “So that thou shalt not need to be afraid for any bugges

- [terrors] by night", as it is also rendered in the COVERDALE and TAVERNER works.
- Breeches* or Geneva Bible (1560) reading in Genesis 3:7 "They sewed fig leaves together and made themselves breeches" [aprons].
- Placemaker's Bible* (about 1562) reading in Matthew 5:9 "Blessed are the placemakers" [peacemakers].
- Bible of the Bear* or Biblia del Oso, being the first published Spanish translation of the whole Bible, so-called from the animal which appeared as the frontispiece, and dated 1567-9 at Basel.
- Treacle Bible* or Bishops' Bible (1568) reading in Jeremiah 8:22 "Is there no tryacle [treacle] in Gilead?"
- Thumb Bible* (Aberdeen about 1607) about the size of a thumb, one inch square, and a half inch thick.
- Rosin Bible*, the Douay Bible of 1609, having in Jeremiah 8:22 the wording "Is there no rosin [balm] in Galaad [Gilead]?"
- He Bible*, the first edition (1611) of the King James Version, reading in Ruth 3:15 "He [she] went into the city", as does the Revised Version.
- She Bible*, the second edition of the King James, appearing in the same year, and correcting this error.
- Adulterous* or *Wicked Bible* (1631) having the seventh commandment printed "Thou shalt commit adultery" in Exodus 20:14.
- Printer's Bible* (about 1702) reading in Psalm 119:161 "Printers [princes] have persecuted me without a cause."
- Vinegar Bible* (Clarendon Press, Oxford, 1717) having the title "Parable of the Vinegar [vineyard]" over the twentieth chapter of Luke.
- Murderer's Bible* (about 1801) reading in Jude 16 "These are murderers [murmurers]."
- To-remain Bible* (Bible Society of Cambridge 1805) having the words "to remain" inserted in Galatians 4:29 instead of a comma.
- Standing Fishes' Bible* (1806) reading in Ezekiel 47:10 "The fishes [fishers] shall stand upon it".
- Discharge Bible* (1806) reading in Timothy 5:21 "I discharge [charge] thee before God."
- Wifehater Bible* (1810) reading in Luke 14:26 "If any man come to me and hate not his own father . . . Yea, and his own wife [life] also".
- Ears-to-ear Bible* (1810) reading in Matthew 13:43 "Who hath ears to ear [hear], let him hear".
- Rebekah's camels Bible* (1823) reading in Genesis 24:61 "And Rebekah arose, and her camels [damsels]". (158)

In very recent years there have appeared several excellent new Bible translations. Among these must be mentioned the translation of the New Testament into everyday English by R. F. WEYMOUTH in 1947 (15), the revision of the Challoner-Rheims version prepared under the direction of Bishop EDWIN V. O'HARA, completed in 1941, and the Revised Standard Version published by the International Council of Religious Education under the direction of L. A. WEIGLE in 1946. Another of the important recent contributions is the English translation in 1940 of the New Testament according to the Eastern text from the Peshitta or original Aramaic sources, by G. M. LAMSA. The rendition of the New Testament into Basic English in 1941 is of considerable interest, although not of any particular value in our study. The attempt to render the entire New Testament into a language of 1000 words naturally does not lend itself to scientific accuracy (7).

Most important of all, however, from our point of view are the splendid translations of Dr. JAMES MOFFATT in 1922-1925 (10, 11, 12) and of Dr. EDGAR J. GOODSPEED and his associates in 1939 (5). These two translations are almost revolutionary in form. Not only have the authors gone back to all the original sources, including many not available to previous translators, but they have studied and compared all the previous versions and have couched their final rendition in everyday English as it is spoken in America today. In scientific matters it is very obvious that they have studied the works of botanical and zoological writers, including the various works discussed by us in this historical sketch. They have not been afraid to adopt the conclusions of modern scientific research wherever these apply. The same high commendation holds for the LEESER and JASTROW versions of the Old Testament prepared for Jewish-English readers. It is a decided joy to read their renditions of many passages whose meaning was effectively obscured by the antiquated and medieval English of previous versions. Many errors have been corrected. Unfortunately, in our opinion there are still instances of mis-identification in even these splendid versions, and even a few new ambiguities and ill-advised

renditions have been initiated. The invention of the name “wake-tree” for the almond is one of these.

As a single typical example of the differences which one finds in rendition of the same passage in different English versions alone may be cited the case of Nahum 2: 3. This is rendered by the King James Version—“and the *fir trees* shall be terribly shaken”, by the JASTROW version—“and the *cypress spears* are made to quiver”, by the GOODSPEED version—“and the *chargers* will prance”, by MOFFATT—“and their *horses* prance at the muster”, and by the Douay version—“and the *drivers* are stupefied.” Here the same word runs the gamut of interpretation from trees to spears to horses to men!

In addition to inaccuracies and ambiguities in the translations themselves, commentators have published many utterly fantastic claims. One, for instance, has stated that the bright tint produced with henna dye on the soles of the feet and the palms of the hands of Oriental women needed renewing once in about two weeks, while the dye on their nails “is permanent for years” (146). It would appear from this that fingernails do not grow as rapidly in the Orient as they do in the Occident—an assumption not at all borne out by the facts! Again, a commentator has said that “blood oranges are produced from a branch (of orange) grafted on a pomegranate stem” (184). These are typical examples of hundreds of such erroneous statements which crowd the literature on Bible plants.

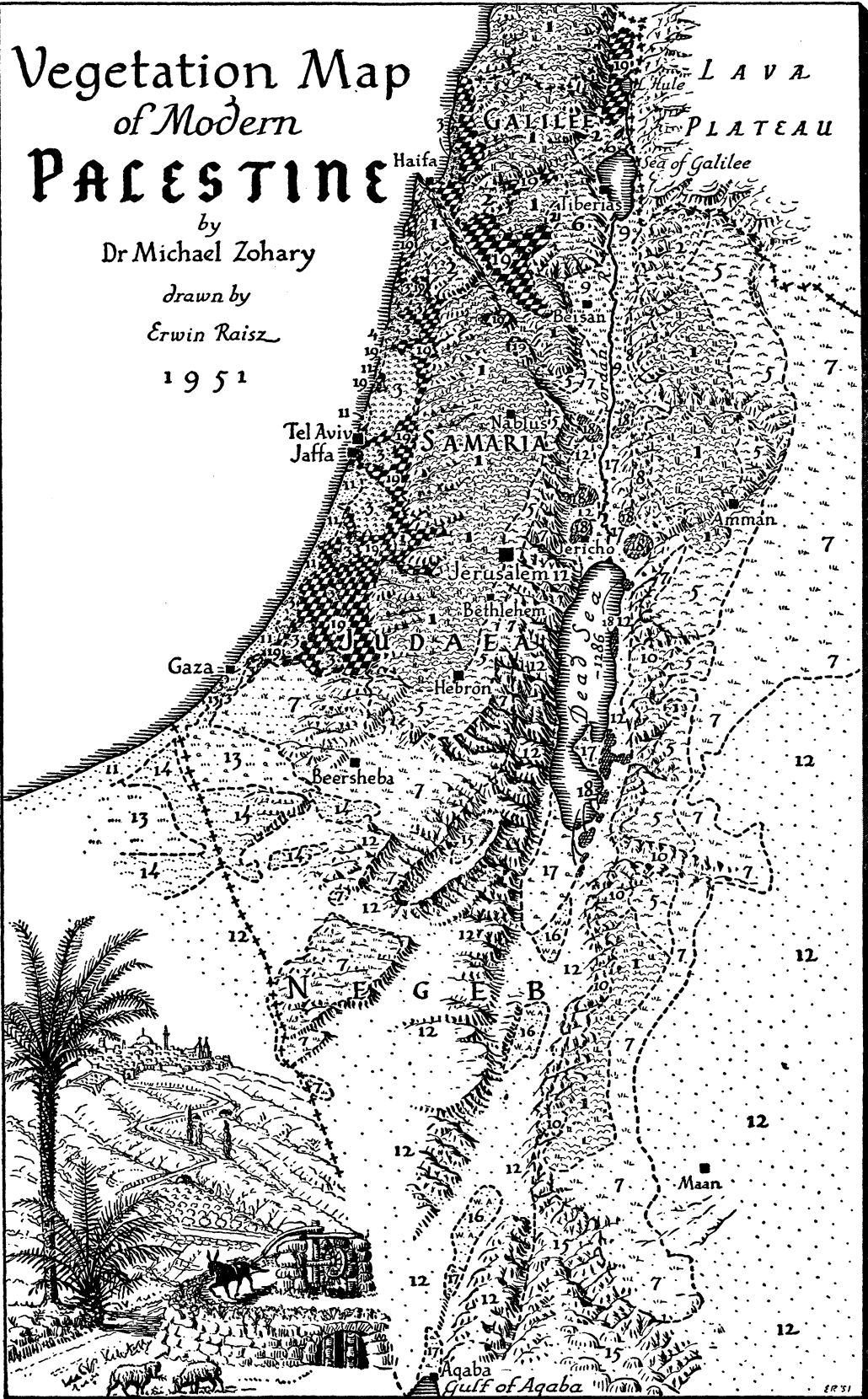


Vegetation Map of Modern PALESTINE

by
Dr Michael Zohary

drawn by
Erwin Raisz

1951



Description of the Land



LOOKING OVER A LIST OF THE ANIMALS AND PLANTS TO WHICH MENTION IS MADE IN THE BIBLE, IT BECOMES EVIDENT AT ONCE THAT THEY ARE PRINCIPALLY THOSE OF EGYPT AND PALESTINE (301), ALTHOUGH, OF COURSE, THERE ARE SOME REFERENCES TO THOSE THAT OCCUR IN ARABIA, THE SINAI PENINSULA, AND SYRIA, AS WELL AS VARIOUS ARTICLES OF MERCHANDISE CONSISTING OF ANIMAL OR VEGETABLE PRODUCTS IMPORTED FROM YEMEN, SOMALILAND, INDIA, AND CEYLON. IT HAS BEEN POINTED OUT (184) THAT THE FAUNA AND FLORA OF THE BIBLE ACCORD WELL WITH THE KNOWN FACTS OF THE GEOGRAPHY AND CHRONOLOGY INVOLVED. THE DOMESTIC ANIMALS AND CEREALS BELONG MOSTLY TO MESOPOTAMIA, PERSIA, AND OTHER LANDS TO THE EAST OF PALESTINE,

an area thought by many anthropologists to represent the cradle of the human race; those of the Pentateuch are in general such as had their origin, or, at least, were very prevalent, in Egypt and the Sinai Peninsula; those of the historical books and most of the Prophets belong more particularly to Palestine; while those of Job are more typically Assyrian than they are Egyptian, Arabian, or Palestinian. The marked paucity of marine references is in accord with the historical fact that the seacoast was never held by the Hebrews.

A few words regarding the present climate and phytogeography of Bible lands are perhaps appropriate here (146). The climate of the Lebanon-Syria-Palestine-Transjordan-Egypt region is extremely varied. Dr. Post has well stated (266) that this area "is unequalled by any of the same size on the globe, not only for the thrilling and important events of human history of which it has been the theatre, but for its unique geological structure, its great diversity of surface and climate, and its remarkable fauna and flora. It is the meeting point of three continents, since Asia Minor must be regarded, from the standpoint of its Natural History, as belonging to Europe rather than Asia, and as such, a link of connection between them all."

On the snow-capped peaks of the Lebanon mountains, which rise to 10,200 feet, and in parts of the Antilebanon chain (4000 to 8700 feet altitude) the climate is almost arctic in severity, while in the lower portions of the Ghor or Jordan Valley it is decidedly tropical. Between these two extremes of temperature, and the extremes in elevation of Lebanon and the Dead Sea (1292 feet below sea level), we find almost every intermediate type of environment. There is the distinct western coastal region with its sand dunes and its lush meadows, the region of inland plains and foothills, the higher uplands, and the lofty tablelands beyond the Jordan. Then there are the surrounding deserts of Syria and, to the south and southwest, of Arabia, the Sinai Peninsula, and Egypt. In Egypt the most outstanding features are the extremely fertile Nile River delta and valley, the extensive dry deserts, and the scattered wadies with their oases, which are also characteristic of the Arabian deserts. The diverse climatic and physiographic features have brought about a corresponding variety in wild life. Tropical bats, Indian owls, and Ethiopian sunbirds are

FIGURE 13. — *Vegetation Map of Modern Palestine* (prepared by Dr. MICHAEL ZOHARY, 1951). — (1) *Mediterranean evergreen forests and Maquis* (Jerusalem pine, Kermes oak, Palestine Terebinth, Lentisk, Carob). — (2) *Mediterranean deciduous forests and Maquis* (Tabor oak, Storax, Atlantic pistachio). — (3) *Light soils belt vegetation* (Eragrostis, Tabor oak, Carob, Lentisk). — (4) *Carob-Lentisk forests on sandy soils*. — (5) *Mediterranean dwarf shrub formation* (Ononis, Salvia, Echinops, Carlina, Ballota). — (6) *Mediterranean dwarf shrub formation as above accompanied by Zizyphus lotus*. — (7) *Irano-Turanian dwarf shrub steppes* (Artemisia herba-alba, Noëa, Haloxylon). — (8) *Irano-Turanian shrub steppes* (Retama duriaei). — (9) *Irano-Turanian shrub steppes* (Zizyphus lotus). — (10) *Irano-Turanian steppes* (no communities identified as yet). — (11) *Vegetation of mobile and semi-stable coastal sands* (Artemisia, Lotus). — (12) *Saharo-Sindian desert vegetation on Hammadas and gypseous soils* (Anabasis, Salsola, Zygophyllum, Suaeda). — (13) *Saharo-Sindian desert vegetation on sandy-loess soils* (Artemisia monosperma, steppes of annual grasses). — (14) *Saharo-Sindian dune vegetation* (Aristida, Retama) in W. Negev. — (15) *Sandy desert vegetation of E. Negev and Edom* (Retama, Anabasis, Haloxylon, Zilla). — (16) *Sandy desert vegetation of Wadi Araba* (Haloxylon persicum, Haloxylon salicornicum). — (17) *Saline desert vegetation* (Tamarix, Arthrocnemum, Suaeda, Atriplex, Salsola, Nitraria). — (18) *Sudano-Deccanian oases vegetation* (Zizyphus, Balanites, Acacia). — (19) *Weeds and hydrophilous vegetation of alluvial plains* (Frosopis, Phragmites, Populus euphratica, Potamogeton).

found in Palestine, along with European robins, skylarks, finches, and wrens. The plants of the coastal plain and southern highlands are mostly the same as, or very similar to, those common in the Mediterranean region as a whole east of Gibraltar. Here one finds the Aleppo pine, myrtle, holm, olive, arbutus, carob, orange, citron, grapevine, fig, and pomegranate, "and the streams are overhung with the roseate blossoms of the oleander" (146).

The remainder of the tablelands which make up the greater part of Palestine east of the Jordan and of Transjordan west of that river, have a flora of a more widely diffused character. There are plants of Europe and central Asia, including even some of the same species as are found naturally in England (although not as many as some writers would have us believe—the relationships in most cases are generic, not specific). Among these plants of the tablelands are pines, junipers, terebinths, almond, apricot, peach, hawthorn, mountain-ash, ivy, honeysuckle, walnut, mulberry, oaks, poplars, willows, "the majestic cedars of Lebanon, the melancholy cypress, and the plane-tree with its wide-spreading shade" (146).

The vegetation of the Jordan valley is of a type most closely related to that of northern Africa, with some western Indian and also some European species interspersed. Here the date-palm once flourished in great numbers, although now only a very few remain. Here grow the acacias and the retam of the Sinai desert and many less well-known plants common to northern Africa and Arabia.

The mountain chains of Lebanon and Antilebanon, in spite of their height and cold, are completely lacking in any truly Arctic species of plants, due, it is thought, to a very hot geological period which preceded the present and which doubtless exterminated them (266). Endemic plants, however, are there in large numbers. The chain of the Antilebanons more or less parallels the higher Lebanons and terminates in the massive Mount Hermon (9400 feet altitude) which dominates northern and eastern Palestine. Between Hermon and the mountains of Gilead is a great lava plateau 40 miles long, formed by the ancient eruptions of the numerous volcanic cones which still dot its surface. This lava outpouring is largely responsible for the fertile wheat fields of Bashan. Rainfall in the westernmost range of mountains varies from 36 to 50 inches due to the fact that these mountains impede the eastward flow of the heavy moisture-laden winds from the Mediterranean Sea. The rainfall on the second range of mountains is about half that of the Lebanons, while that of the eastern plateau is not more than 10 to 12 inches. Although the entire Lebanon-Syria-Palestine-Transjordan-Sinai region is only about the size of New York state or of England, it has a vascular flora of at least 126 families, 850 genera, and 3500 species (266). If the Biblical portion of Egypt is included, the entire area of Bible lands would be about equivalent to that of New York and Maryland, or less than that of England and Scotland combined. And over all this area, except the most remote, are now the introduced weeds from Europe, Asia, Africa, and even America, and, in cultivation, exotics of hundreds of kinds from every corner of the globe.

The barrenness and desolation of so much of Palestine, Syria, and Transjordan today are laid to two chief causes: first, the cutting down of the natural timbers by the natives and by successive hordes of invaders from the time of SENNACHERIB (705-681 B. C.) to that of TITUS (70 A. D.), leaving the exposed land to be eroded and the fertile topsoil to be carried off, much as in parts of our own American Middle West; second, the neglect of the ancient terrace-type cultivation, which was the precursor of our modern contour-plowing. "Originally Palestine was emphatically 'a good land, a land of brooks of water, of fountains and depths that spring out of valleys and hills'; a land whose inhabitants could 'eat bread without scarceness' and 'not lack anything in it'. It was 'a pleasant portion' and 'a delightful land' (Deut. 8: 7-9; Jerem. 12: 10; Mal. 3: 12). But centuries of misrule and neglect have combined with natural agencies to make desolate this once favored heritage. The winter rains have swept the thin soil from the hill-sides, the sword of the conqueror and the ax of the peasant have demolished both forest and fruit-tree; many a

spring has thus run dry, and many a stream now feeds only a pestilential marsh; the 'soil mourneth and languisheth' and the ancient prediction is fulfilled by the operation of natural but unerring laws" (146)—"When Lebanon withers in shame, and Sharon sinks to a desert, and Bashan and Karmel are leafless" (Isaiah 33: 9, MOFFATT translation). And the modern botanist confirms the equally complete and literal accuracy of the ancient prophetic denunciation: "Upon the land of my people shall come up thorns and briers; yea, upon all the houses of joy in the joyous city . . . The thorn and the thistle shall come upon their altars" (Isaiah 32: 13; Hosea 10: 8).

The year in Palestine is naturally divided into two seasons beginning, according to DALMAN (97) with the winter "rains" from December or a trifle earlier and lasting for about two hundred days, after which the winds reverse their course and the east or desert winds complete the rest of the calendar year with a "summer" dryness. It seems that even today Palestinians refer very infrequently to time and events as measured by formal calendar dates, but rather to them in terms of a natural calendar which is marked off by the time of sowing, pruning, and harvesting for each of the main crops. Throughout the Bible there are found no formal calendar references. The Hebrews set their natural calendars according to the moon. Their gentile neighbors had similar natural calendar time reckoning, but it was set according to the sun (97).

FONDA of the United States Soil Conservation Service writes: "Even in the most material sense the psalmist who scribed the 24th psalm, 'The earth is the Lord's and the fullness thereof', knew what he was writing. Throughout the ages, in one way or another, man has disputed this stewardship of the land, claiming its use for personal and often selfish benefits. Parts of the old Biblical land are among the countries which offer some of the world's most stark testimonials of soil erosion and land exploitation. Dr. W. C. LOWDERMILK, an eminent student of land use in the Biblical regions as well as other areas, states: 'Out of the land of Mesopotamia came the stories of the "Flood" and of NOAH and the Ark; JONAH and Nineveh and of the "Tower of Babel". Here also was the traditional site of the Garden of Eden, where ADAM and EVE were food gatherers. Today it is as barren of vegetation as though shaved with a razor.' Fabulous old cities, now covered deep with shifting sands, broken and weathered olive presses and other relics of human endeavor and life offer mute testimony to the bountiful prosperity man once enjoyed from the then rich soil and flourishing agriculture. 'The land which we passed through to spy it out is an exceeding good land—a land which floweth with milk and honey.' This was the minority report submitted by JOSHUA and CALEB to MOSES, who had sent these two and ten other men to spy out the land of Canaan. Dr. LOWDERMILK writes that 'The Promised Land', which three thousand years ago was 'flowing with milk and honey', has been so devastated by soil erosion that the soils have been swept off fully half the area of the hill lands. A survey of ancient village sites abandoned and now occupied discloses how the lands of Palestine have been depopulated since the seventh century" (120).





FIGURE 14. — A view of Bethlehem from the southwest. Neglect of the ancient terrace type cultivation on steep hillsides, like this, soon completed the total destruction of the land begun originally by the ruthless deforestation and carried on by the thoughtless exploitation of man over a history of 6,000 or more

years. The leafy trees are olives. Ruins such as are seen in the foreground are now often covered by caper and prickly-pear plants. (Wood engraving from C. W. Wilson's *Picturesque Palestine*, 1883).

Helps to Users of this Work



SCRIPTURAL CITATIONS AS GIVEN AT THE BEGINNING OF THE CHAPTERS ARE TAKEN IN EVERY CASE FROM THE AUTHORIZED VERSION OF KING JAMES, SINCE THAT IS THE MOST GENERALLY USED VERSION AMONG ENGLISH-SPEAKING PEOPLE. TO CONSERVE SPACE ONLY THE MOST IMPORTANT OR INTERESTING VERSES ARE QUOTED IN EACH CHAPTER, AND IN CASES WHERE THE REFERENCES ARE LENGTHY, ONLY THE MOST RELEVANT PARTS OF EACH VERSE. AT THE END OF EACH CHAPTER WE HAVE PLACED THE NAMES OF THE PLANTS WHICH WE REGARD AS THE ONES REFERRED TO IN THE CITED VERSES OF SCRIPTURE IMMEDIATELY BELOW THEM. THESE NAMES AND AUTHORITIES ARE, IN GENERAL, IN ACCORDANCE WITH POST (266, 267), OR, IN THE CASE OF BACTERIA AND RELATED SCHIZOPHYTES, IN ACCORDANCE WITH THE LATEST EDITION OF BERGEY'S MANUAL (52). WHERE VERSES OR PARTS OF VERSES ARE OMITTED THIS

fact is indicated by a series of dots—the length of this series of dots bears no definite relation to the number of verses or words omitted. Where a quotation ends at the conclusion of a verse a period is placed regardless of the punctuation mark which may occur there in the original (except for interrogation and exclamation points, which are naturally retained). In all other cases the spelling, capitalization, and punctuation of the original are retained. The italicization of supplied words as given in the King James Version is, however, not retained. Instead, we are italicizing in each quotation the word or words chiefly involved in that particular chapter. All personal names are printed in small capitals as per the rules of the Cambridge and Oxford University Presses, unless they are employed in such a way as not actually to refer to persons.

In the body of each chapter we refer to the 1611 Authorized Version of King James I either as the "Authorized Version" or the "King James Version" (2, 3, 17); the 1914 edition of the Challoner-Rheims-Douay version as the "Douay version" (1); the 1941 revision of the Challoner-Rheims-Douay version edited under the patronage of the Episcopal Committee of the Confraternity of Christian Doctrine as the "O'HARA version" (13); Dr. MOFFATT'S three volumes as the "MOFFATT version" (10, 11, 12); Dr. LAMSA'S translation of the New Testament as the "LAMSA version" (8); the 5th edition (1943) of Dr. WEYMOUTH'S translation into everyday English as the "WEYMOUTH version" (15); the Jewish Publication Society of America's 1946 edition as the "JASTROW version" (16); the Revised Standard Version of 1946 as the "WEIGLE version" (14); the 1939 "Complete Bible: an American translation" by E. J. GOODSPEED, T. J. MEEK, L. WATERMAN, J. M. P. SMITH, and A. R. GORDON as the "GOODSPEED version" (5); and the "Twenty-four books of the Holy Scriptures carefully translated after the best Jewish authorities" by I. LEESSER in 1913 as the "LEESSER version" (9).

In parentheses throughout the work will be found the numbers referring to items in our bibliography on pages 259 to 270 from which the statements quoted have been taken or which are authority for statements there made. No attempt has been made thus to refer to every place in the bibliography where a statement is made, for very many of the statements occur in numerous of the works cited. Only the most striking or controversial statements are thus indicated. As a matter of general popular interest the procedure of previous authors on this subject has been followed, and interesting myths, superstitions, and legends about the plants in question, or their close relatives, are given in very brief form in many of the chapters. No attempt has been made to make this discussion of the mythology and folklore of the plants or their use in medicine or present day arts complete. Such material of this character as is

given is taken largely from R. A. COTES' "Bible flowers" (95), H. FRIEND'S "Flowers and flower lore" (125, 126), SKINNER'S "Myths and legends of flowers, trees, fruits, and plants in all ages and in all climes" (298), previous works on Scriptural natural history, and such standard sources as WEBSTER'S dictionary (158) and the Twentieth Century Encyclopedia (373). For more information on this subject the reader is referred to these books. Our sincere thanks are hereby rendered to the publishers and copyright owners of these books, the various editions and translations of the Bible or its several parts, and the many other publications listed in our bibliography and cited in various parts of this work, for their kind permission to quote from their works.

Some of the versions of the Bible do not employ the same names for the various component books, nor are they always included in the same sequence. The names and sequence adopted by us in this work are those of the King James Version. Similarly, the chapter and verse numbers used by us are those of that version. Readers desirous of looking up a given reference in another version must bear in mind the discrepancy that often occurs in the numbering of the chapters and verses. To conserve space we refer to the Song of Solomon simply as "Song" and the Acts of the Apostles as "Acts". The following table indicates the different names under which the various books of the Bible will be found in the leading Protestant, Catholic, and Jewish Bibles in use today. The number preceding each name indicates the numerical position of that book in the sequence of that particular version:

<i>Authorized Version:</i>	<i>Douay Version:</i>	<i>Jastrow Version:</i>
1. GENESIS.....	1. GENESIS.....	1. GENESIS
2. EXODUS.....	2. EXODUS.....	2. EXODUS
3. LEVITICUS.....	3. LEVITICUS.....	3. LEVITICUS
4. NUMBERS.....	4. NUMBERS.....	4. NUMBERS
5. DEUTERONOMY.....	5. DEUTERONOMY.....	5. DEUTERONOMY
6. JOSHUA.....	6. JOSUE.....	6. JOSHUA
7. JUDGES.....	7. JUDGES.....	7. JUDGES
8. RUTH.....	8. RUTH.....	31. RUTH
9. I SAMUEL.....	9. I KINGS.....	8. I SAMUEL
10. II SAMUEL.....	10. II KINGS.....	9. II SAMUEL
11. I KINGS.....	11. III KINGS.....	10. I KINGS
12. II KINGS.....	12. IV KINGS.....	11. II KINGS
13. I CHRONICLES.....	13. I PARALIPOMENON.....	38. I CHRONICLES
14. II CHRONICLES.....	14. II PARALIPOMENON.....	39. II CHRONICLES
15. EZRA.....	15. I ESDRAS.....	36. EZRA
16. NEHEMIAH.....	16. II ESDRAS.....	37. NEHEMIAH
17. ESTHER.....	19. ESTHER.....	34. ESTHER
18. JOB.....	20. JOB.....	29. JOB
19. PSALMS.....	21. PSALMS.....	27. PSALMS
20. PROVERBS.....	22. PROVERBS.....	28. PROVERBS
21. ECCLESIASTES.....	23. ECCLESIASTES.....	33. ECCLESIASTES
22. SONG OF SOLOMON.....	24. CANTICLE OF CANTICLES.....	30. SONG OF SONGS
23. ISAIAH.....	27. ISAIAS.....	12. ISAIAH
24. JEREMIAH.....	28. JEREMIAS.....	13. JEREMIAH
25. LAMENTATIONS.....	29. LAMENTATIONS.....	32. LAMENTATIONS
26. EZEKIEL.....	31. EZECHIEL.....	14. EZEKIEL
27. DANIEL.....	32. DANIEL.....	35. DANIEL
28. HOSEA.....	33. OSEE.....	15. HOSEA
29. JOEL.....	34. JOEL.....	16. JOEL
30. AMOS.....	35. AMOS.....	17. AMOS
31. OBADIAH.....	36. ABDIAS.....	18. OBADIAH
32. JONAH.....	37. JONAH.....	19. JONAH
33. MICAH.....	38. MICHAES.....	20. MICAH
34. NAHUM.....	39. NAHUM.....	21. NAHUM
35. HABAKKUK.....	40. HABACUC.....	22. HABAKKUK
36. ZEPHANIAH.....	41. SOPHONIAS.....	23. ZEPHANIAH
37. HAGGAI.....	42. AGGEUS.....	24. HAGGAI
38. ZECHARIAH.....	43. ZACHARIAS.....	25. ZECHARIAH
39. MALACHI.....	44. MALACHIAS.....	26. MALACHI
40. I ESDRAS.....		
41. II ESDRAS.....		
42. TOBIT.....	17. TOBIAS.....	
43. JUDITH.....	18. JUDITH.....	
44. ADDITIONS TO ESTHER.....		