A MONOGRAPH
OF THE
GENUS
LILIUM

BY
HENRY JOHN ELWES.F.L.S.F.Z.S.

ILLUSTRATED BY
W.H.FITCH.F.L.S.

1880.
TO

MY WIFE

WHO FIRST LED ME TO THE CULTURE OF PLANTS,

AND WHOSE

LOVE FOR LILIES SUGGESTED TO ME THEIR STUDY.

I DEDICATE THIS BOOK.

In Memory of

THE HAPPY DAYS I HAVE SPENT IN ITS PREPARATION.
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*Scenes in the Northeast Himalayas at about 2000 feet elevation, where *Lilium polyphyllum* is found. (Photographed by
dr. HOWE and SHEPHERD, Calcutta.)*
ERRATA

Under Laura mercurialis, line 23, for 1-1.4 letters read 0-11.4 letters.

Lanoevistan, page 6, 2nd line, for 1870 read 1877.
INTRODUCTION.

BEFORE attempting to give a general sketch of the true Lilies, I must inform my readers that the book is not the work of a scientific botanist, but is merely the result of a few years' horticultural study, during which I have endeavoured to bring together all the information which seemed likely to elucidate as far as possible some of the difficult questions which are met with in the study of these plants.

To enable a person to understand, even imperfectly, the various subjects which must be mastered before he can hope, in modern times, to claim to the title of a botanist, a long course of study must be undertaken; and as I have never had the opportunity of acquiring a scientific education, I do not suppose that I have any right to call this a monograph, by which I understand an exhaustive account of every fact which bears on the development, classification, and history of the objects in question. It seems to me, however, that no botanist, however great may be his attainments, is able to understand thoroughly the relations and affinities of orders, and particularly of such orders as Liliacez, Amaryllidacez, Orchidacez, and other Monocotyledons, unless he has the opportunity of studying the living plants. To do this he must be either a horticulturist, or must have the assistance of a gardener whose mind is not exclusively devoted to the ornamental or the greenhouse branch of his art.

I think it is not yet fully recognized how intimately the two sciences of botany and horticulture are connected. No horticulturist can attain the higher ranks of his profession without a more or less accurate knowledge of botany; and no botanist can be said to be more than half master of his subject whose studies have been confined to the library and the herbarium.

For this reason we find that such men as Herbert, Lindley, Wallach, Sir William and Sir Joseph Hooker, Redouté, Trámier, and Anna Gray have attained a prominent distinction as scientific botanists, and from the same cause it will be found, as time goes on, that a large and well-supported garden is as much an absolute necessity to the working botanist as a library and an herbarium.

No one who has attempted to compare botanical descriptions of Monocotyledonous plants with the living realities can have failed to meet with extreme difficulty in identifying them, or to realize the fact that an accurate drawing is more useful than such a description as can be usually made from dried specimens.

The cultivation of plants is a subject that would require much space even to touch upon; but I may say that I fully concur in the idea which was so strongly supported by that excellent botanist Dean Herba, in
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the admirable paper at the end of his work on the Amaryllidaceae, on "Ovaries and Hybrid Intermixtures in Vegetables."—that the true way to test the validity of a so-called species is by propagating it from seed, when the tendency to vary possessed by the species will be made manifest, and the varieties produced will show the observer how far he may rely upon certain characters in separating the species from others. In the same way, I think that the surest way to test the validity of a genus is to attempt to hybridize the members of it with other plants, when, if we find that they will cross readily with another belonging to an apparently different genus, it affords a strong presumption of the identity of those genera.

This subject, however, is surrounded with such a multitude of difficulties that it requires the judgment and power of observation of a Darwin to investigate it with fitting accuracy. Let it suffice to say that I know of no case in which a Lily has been crossed with a plant belonging to any other genus, and that the numerous attempts at hybridizing the true Liliums have as yet met with very little success.

If any of the conclusions I have arrived at, as to the classification of the genus Lilium, are not in accordance with the views that have been expressed by others, I can only say that I have in all cases endeavored to consider facts only, and have no preconceived theory, or desire to favor the theories of others.

It may be that, as horticulturists increase in number, and our knowledge of plants in a state of nature extends, many new facts bearing on the question will be discovered: and I can safely say that some of the plants which now seem to deserve specific distinction may be reduced to the rank of varieties, whilst other forms may be proved worthy of specific rank. In this view, I can only say that I shall welcome any well-founded corrections that may be introduced into the genus, as no one can be more sensible than myself of the imperfections of my work, and no one can feel more strongly than I do that science truth is the first object which every worker in the great field of nature should hold up as the aim of his studies.

With regard to the present knowledge of the genus Lilium, I can say that I do not think many new species remain to be discovered; for though I have used every means to procure plants, living or dead, from every part of the world where Lilies are known, or are likely to occur, not more than three or four species have been added to the genus in the last four years.

The only regions from which much novelty can be expected are the Eastern Himalayas and the immense tract of unexplored and difficult mountain country which surrounds our Indian empire on the north and east, and which lies round the head-waters of the Irrawaddy, the Brahmaputra, and the Yung-sa-ching. Many years must elapse, however, before these regions can be even partially explored, as the extreme difficulty of the country, and the excessive jealousy and barbarism of the tribes which inhabit it, make this region more difficult of access than perhaps any other part of the world.

The Corean peninsula may also produce some new species of Lily; but though the flora of that country is absolutely unknown to us, it may be expected that any indigenous plants of great beauty or horticultural value have already found their way into the gardens of Japan.

Having found, by experience, that drawings of plants made from dried specimens frequently fail to give a good idea of their aspect and character, I have made it my object to procure living plants of every species which it was possible to obtain, and have had under cultivation in my own garden every known species of Lily hitherto described. Whenever I have been required, in order to dried specimens, or to drawings, as material for my illustrations, I have mentioned the fact in the accompanying description. It has been objected by some botanists that plants drawn from highly cultivated garden specimens do not give a good idea of the plants in a state of nature; and there are, no doubt, cases in which this is more or less the fact.

Experience, however, teaches that the state of perfection in which any Lily may be brought in cultivation, is not greater than the plant is capable of attaining under thoroughly favorable conditions in a wild state; and in proof of this I may say that the plates of "L. albopurpurea, L. washingtonianum, L. monadelphum, and others.
which are taken from the finest specimens I could procure, and which are no doubt much finer than is usual in cultivation, fall short, both in the number and in the size of their flowers, of the descriptions I have received of their growth, under favourable circumstances, in their native countries, as well as of dried specimens which I have examined.

The extreme tendency to variation in nearly all the Lilies makes it impossible to give illustrations which represent faithfully all their forms: but it has been my constant endeavour, as well as that of Mr. Fitch, to combine truthful delineation with artistic excellence. The colouring of the plates has, in some few cases, fallen short of what I could have wished, but though I have spared neither pains or expense to get this done as accurately as possible, there are some facts, such as the shining scarlet of L. chalcedonica, which cannot be exactly reproduced except in oil-colours.

The materials which I have used in working out the synonymy, distribution, and variation of the plants have been as follows—the dried specimens in the public herbaria of Kew, Paris, Leyden, and Berlin; the type specimens of Humboldt's herbarium at Upsala; the living plants in my own garden, in the Botanic Gardens of Kew and Edinburgh, and in the collections of my friends Messrs. G. F. Williams, George Marsh, John Kenneth, H. Head, and many others, to all of whom I must again express my most hearty thanks for the freedom which they have allowed me to make of their specimens and drawings, and for the kindness with which they have aided me in getting all possible information. From Messrs. Barne, Hicks, Backhouse, Dr. Galpin, Mr. Henry, W. Waller, and other professional horticulturists I have also received invaluable assistance and information; and I must say that the enterprise shown by these and others, in the introduction and propagation of plants (many of which do not prove profitable from a business point of view), has been, and I hope will always be, of the very greatest service and advantage to the botanist and scientific horticulturist.

Among my correspondents abroad, I must thank especially Mr. Deless, and Prof. Mairinger of St. Peterburg, Dr. Maximilian of Berlin, Prof. De Backer and the Arc de Triomphe of Paris, Dr. Kindi of Calcutta, Prof. Scrope and Watson of Harvard University, and Messrs. Parkinson and Hesler, Otto Geikie, and others in the United States, for the immense assistance they have given me in procuring information and plants, all of which I have acknowledged in the body of the work, and without which it would have been impossible to complete it.

And, finally, most important is the assistance I have received from Mr. J. G. Baker, of the Royal Horticultural of Kew, upon whose Revision of the Lilies in the 'Journal of the Linnean Society' all my work is based. From the scientific descriptions I have used in almost all cases, and without whose experience and help, so freely afforded to myself and others, I feel I should have failed to keep my work free from many errors and omissions.

LITERARY HISTORY OF THE GENUS.

The Lilies, being in every sense and beautiful plants, have attracted the attention of authors from so early a date that it would be impossible to enumerate all the pre-Linnean writers who have mentioned them; and those who are curious as to their ancient and medieval history will do well to consult M. de Candolle's 'Monographie Historique et Littéraire des Liliacées' (Mallozzi, 1876), where many quotations are given in poetry and prose, and where many strange facts and fancies concerning Lilies are quoted from numerous authors. For our present purpose, however, it will only be necessary to mention a very few of these, among whom Parkinson takes a leading place. This charming old writer, whose 'Paradisus, or Garden of Pleasant Flowers' was
published in 1689, puts the Lilies at the commencement of his work, "because the Lily is the most stately flower among man," and after describing the Crown Imperial, which "for his stately beauty and softness, deserves the first place in this our garden of delight," proceeds to enumerate the species known to him, which are described with wonderful accuracy in the quaintest of Elizabethan nomenclature. Parkinson mentions five varieties of the "Martagon Imperial" (L. Martagon):— the spotted Martagon of Canada (L. canadense), which had been already introduced to Europe at this early period; "the red Martagon or Martagon Pompous" (L. pomponium); the "yellow spotted Martagon" (L. pseudomartagon); and "the yellow spotted Martagon of Constantinople" (L. chaleedonicum). He gives rough though characteristic descriptions of these plants, and mentions the "place" or habitat, the "time" or season of flowering, and the "names" or synonyms of each. Of the same Lilies he mentions the varieties, distinguishing clearly between L. elegans (the "gold red lily") and L. ariliferum ("the red-bulbed Lily"). He then describes two varieties of the white Lily, which complete the list of those known to him.

Karren, in the 'Avec des Vaisseaux,' published in 1712, mentions several species of Lilies, among which, though they were ignored or overlooked by Linnaeus, L. candidum, L. speciosum, and L. pyrenaicum can probably be recognized.

Linnaeus, in the 3rd edition of his 'Systema Plantarum' (1789), describes nine species, viz. L. candidum, L. bulbiferum, L. speciosum, L. chalcedonicum, L. superbum, L. Martagon, L. canadense, L. philadelphicum, and L. haemasthenium. He treats as varieties several plants which are now ranked as species, and includes one, L. haemasthenium, which are now refer to the genus Fritillaria.

Thunberg, who spent many years in Japan, published, in 1786, his 'Flora Japonica,' in which the following species are described (L. elegans = L. japonicum; L. pomponium, probably = L. callolium; L. bulbiferum, = L. elegans; L. superbum, = L. speciosum; L. candidum, = L. Martagon, L. philadelphicum, and L. elegans). He seems to have determined to make all the species he found in Japan agree with those described by Linnaeus; and, in consequence, we are unable to identify with certainty several of them; but, in the second volume of the 'Memoirs of the Linnaean Society,' he gives further details of some of his species, and describes L. speciosum, L. haemasthenium, and L. elegans. He also describes nine species, L. speciosum, L. haemasthenium, and L. elegans. Still later he published, in the 'Memoirs of the Imperial Academy of Sciences of St. Petersburg,' seven species are described, and three badly figured, viz. L. haemasthenium, L. elegans, and L. superbum. Most of Thunberg's descriptions are too vague, or taken from such imperfect or abnormal specimens, that they cannot be relied on with certainty; and it was only by examining the specimens in his herbarium that I was able to make out that L. martagonum and L. haemasthenium are not good species, and that L. elegans is what has been hitherto known as L. Thunbergianum.

Though Walther, Ménage, Guiller, Don, Funier, and others added one or more species each to the genus, no great increase to our knowledge was obtained until you Sennert went to Japan and sent home numerous specimens of Lilies, both living and dried, about 1830. All those which he found were enumerated in Sennert's and Zuccarini's 'Flora Japonica,' where L. elegans is first described, and a fair account given of the other species known to him.

Nozeman and Schulze's 'Systema Vegetabilium' (1822) and Kuntze's 'Enumeratio' (1843), being merely descriptive catalogues of plants, need not be referred to, except to say that L. Wallichianum was first described by Schulze.

The first attempt at a monograph of the genus is the 'Mémoires sur les espèces du genre Lilie,' by D. Reaum, published in 1817, in the nineteenth volume of the 'Mémoires de l'Académie Royale de Belgique.'

This memoir enumerates all the species known at that time, and gives careful descriptions, with synonyms, history, and detailed instructions for the cultivation of the various species. It was by far the most
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A complete and useful account of the genus until quite recently, as it includes all Steenow's discoveries, and, being the work of a skilled horticulturist and fair botanist, was based on careful observations of living plants, which, as I have before said, are indispensable for the study of Lilies.

In 1870, Professor Duchartre of Paris, was attracted by the unequalled collection of living Lilies formed by Henri Max Letten of Calvados, and, wishing to make them better known to the horticultural and scientistic world, he published, in the second series of the Journal of the Société Centrale d'Horticulture of France, his "Observations sur le Genre Lis," a elaborate and most careful paper of 142 pages, in which the history and classification of the genus is elaborated with much detail, and careful descriptions in French are given of all the species then known.

About the same time Mr. J. G. Baker, of Kew, published, in a series of articles in the "Gardener's Chronicle" for 1871, a synopsis of the genus, which has had an enormous influence in making it better known and appreciated by horticulturists, and was the principal guide I had in taking up its study.

The direct result of the labours of Max letten, Duchartre, and Baker has been so great that I do not think there is any genus of plants, having so extensive a range of distribution, which has been studied with so much completeness, or about which so little remains to be discovered, as the Lilies, and, though there is much to be done before the relations of their development and variation can be said to be fully known, yet I do not think the publication of a Monograph on them is so premature as it would be in the case of most other widely-ranging genera of plants.

Pro. senescio Waseo has recently published, in the fourteenth volume of the "Proceedings of the American Academy of Arts and Sciences," July 1879, a Revision of the North-American Lilies, which gives a complete description of the Lilies of that country, and which, I am glad to see, agrees very nearly with my conclusions as to the species and varieties.

Besides the writers already mentioned, the late Pro. Karl Koch has published, in the "Wochen-schrift für Gartenbau und Pflanzenkunde" for July and August 1870, a memoir of the genus, in which he gives a key to their classification, together with critical notes on their synonymy and distribution.

Mr. J. H. Kalmia of Hatlem, whose nursery probably contains a larger number of Lilies than any others in the world, has published a "Notice sur quelques espèces et variétés de Lis," in which several species are described and figured, among them L. Violiris, L. Humboldti, and L. spicatum flos pes.

In America, Dr. Kalmia has described several of the western species in the "Proceedings of the California Academy of Natural Science," and many notes on hybridisation and cultivation have appeared in various periodicals.

The horticultural journals of the last few years, especially the "Hardware's Chronicle" and the "Garden," also contain an immense number of valuable notices concerning Lilies.

As a strictly scientistic account of the genus, Mr. Baker's Revision of the Tulipes, in the "Journal of the Lancer Society" for 1871, is preëminent. His remarks on the affinities, relations, and morphology of the genus cannot be neglected by any one wishing to understand them thoroughly.

Pro. Duchartre, of Paris, has published, in the "Bibliothèque de l'École des Hautes Études" vol. vi, 1872, and vol. lv, 1873, two most remarkable memoirs on the bulbs of Lilies, in which the various stages of their development from the seed are most carefully described and figured with extreme care and minuteness. An excellent series of drawings of the bulbs of Lilies in their adult state has been made by Mr. Boume, and was published in "The Garden" in 1872.
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CLASSIFICATION.

In Mr. Baker's excellent work on the Lilies, which is the latest as well as the most complete and systematic arrangement of the order, the Lilies are included with the Tulips, Primulas, China-orchids, Hyacinthas, and Lilies in the tribe Tulipæ, and form a very homogeneous group of the plants included in it, being aberrant from the general type. It has been subdivided into five subgenera, of which four are natural and well-marked, but there are a few phases which do not seem to me to fall conveniently under either of these subdivisions.

The characters by which we can best classify the Lilies are taken from the bulb, and from the form and position of the flowers. The first subgenus, Cardiœrum of Endlicher, is a very distinct and well-marked one, and comprises only two nearly allied, though perfectly distinct species, L. giganteum and L. cordatum. The bulb in these is formed of a few thickly closely compressed scales, produced into long petioles, which bear a large ovate or ovate-lanceolate green leaf. Until the bulb becomes strong enough to flower, which is not before its sixth or seventh year, there is no stem or other leaf than these basal ones; but the flowering stem, when produced, absciss the whole" and emerges of the bulb, and the plant passes completely after flowering and ripening seed, which is produced very abundantly. In some cases, however, offsets are formed at the base of the old bulb, which in time grow to a flowering size. Now this manner of reproduction, usually by seeds, appears to me the natural and regular course in this subgenus; for though in cultivation the reproduction by offsets is the more common, yet in its native forests L. giganteum appeared to me to grow as though all the plants were seedlings, and I found no groups of offsets about the base of the old stems, as one finds in garden plants. I should not therefore, consider that either of these species is a true perennial, and am inclined to think that many other Lilies usually considered perennial are not so, strictly speaking, for I have found that many of them, after being brought to the highest state of perfection, and having produced seeds freely, die away unaccountably, as though they had fulfilled their functions, and had by the act of seeding exhausted all the vitality of the bulbs.

The next subgenus, Eulirion of Endlicher, is characterized by long tubular flowers, the segments of which are rarely united, except at their tips. It includes, according to Mr. Baker's arrangement, the following species—L. philippinense, Hillicostum, nigula, Eulirion, Browni, japonicum, candidum, Belladonna, and Washingtonianum. Now as in the first six of these plants, there can be no question about the propriety of this arrangement, as they seem to me to be very possibly only subspecies, and comprise all the representatives of the family found in the eastern tropical or Oriental region—the sixth, L. Browni, being an outlying representative in Japan. But I think that L. japonicum has more affinity with L. ornatum, placed by Mr. Baker in another group; L. belladonna is probably a synonym of L. auratum, our common white Lily; L. candidum (our common white Lily) seems to me to have sufficient peculiarities in structure and habit to justify its separation from the Eulirion group; and L. Washingtonianum I should be inclined to place, with two near allies or subspecies, in another section.

In the subgenus Bulirion thus restricted we find a very different bulb-structure, consisting of a large number of thinner pointed scales, which bear narrow linear leaves only, in their earliest stages of growth, and throw up stems at the age of two or three years, flowering freely and ripening seed. Usually, however, they produce as well a number of small bulblts, which are formed either at the base of the old scales, or at the base of the stem, or all along its subterraneous portion, and frequently at various points on the stem above ground, especially when any injury has checked or arrested the formation of flowers.

The plants included in the genus Bulirion seem therefore to be true perennials; that is to say, they possess the power of reproducing themselves for an indefinite period without seeding. They are the only Lilies which are found within the tropics, and appear to require, and to thrive under, a greater degree of heat than other Lilies, though they are all inhabitants of hilly or elevated regions. I believe that the success of growth in these plants is regulated, in their native countries, not by the summer and winter, but by the rainy and dry seasons.
L. Walliehianum and L. nilgherriense, at any rate, do not commence growth till the rains begin in June, and ripen their seed in midwinter, when all the Lilies of temperate climes have gone to rest.

With regard to L. candidum, we find certain characters of habit which seem to keep it apart from other Lilies. First, it has, like L. giganteum, leaves of two different classes—first, the basal leaves, which are borne on the new scales in the centre of the bulb, and appear early in autumn, coinciding with the period of annual rains in the countries to which it is supposed to be indigenous; and, secondly, the stem-leaves, which are borne on the flowering stem, and do not appear till the basal leaves are withering. The flowers of this Lily are also not quite similar in form to those of the Eulirion or any other group; so that the plant seems to have some claim to separate distinction.

L. Washingtonianum, with its variety or subspecies L. purpureum, and a newly-discovered plant, L. Parryi, though resembling the Eulirion group in a certain extent in their flowers, are so different in the structure of their bulbs, that they must also stand in a group apart from any other.

The next section is Eulirion of Baker, in which he includes L. giganteum, Eulirion, auratum, and vegetatianum. This does not appear to me any very natural group, L. giganteum seeming to have more in common with the Martagons, whilst L. vegetatianum is an aberrant form, differing entirely in bulb and leaf, and having nothing but the position of the flowers to bring it near auratum. If this section is to stand, I think it should include L. japonicum, which is certainly nearer to auratum than to the Eulirion Lilies.

The next subgenus is Indirio of Baker, including all the plants with erect flowers and fallate segments not reduced. Four of the species comprising it, viz. Indirion, auratum, elongatum, and variegatum, are so nearly allied that they have been considered, with much reason, as only varieties, and can so closely be brought to each other, that it is impossible to distinguish some of the garden varieties and hybrids which they have produced. These plants, again, may be called perennials—propagating themselves constantly by means of offsets as well as by seeds, which are very sparingly produced and even in cultivation, as it seems, in nature.

The other four plants included in this section by Mr. Baker, namely L. concolor, L. philadelphia, L. Catesbeianum, and L. unicolor, are, in regards their flowers, fairly uniform with the Indirion group, but in their bulbs and leaf very dissimilar, having individual peculiarities of considerable importance, which are alluded to in detail in the text of this work, and which are probably modifications of structure, intimately connected with the natural conditions under which they grow. L. Catesbeianum is a small, delicate species, confined to a very narrow range as regards its distribution, and probably not fitted to survive in the struggle for existence with other plants.

In the case of L. unicolor, if the very limited materials on which our knowledge of the plant is based do not mislead us, we have a species resembling the others with which it is grouped in nothing but the position of the flowers, but so nearly allied to L. auratum in every other respect, that I cannot help suspecting an aberrant condition of the specimen on which it was founded. If not, I can only say that, however systematic the subgenera may be which includes it, it is not natural, and the case would tend to show that the position of the flowers is not in all cases a character on which much reliance can be placed.

The last and most numerous section of Lilies is called Martagons by Roxburgh, and includes all those with comose flowers and each-recurved segments. It may be again subdivided into the American group, with triangular ovate bulbs, like L. candidum and L. nettlei; and into the Old-World group, with oval regular bulbs, like Loewii, meadiolides, and chalcedonicum. But here again, we have several plants possessing characters which will not allow them to fall into what would be otherwise a very convenient arrangement—L. Leichtlini being much more akin to L. giganteum than to the true Martagons, and L. meadiolides not only having a quite peculiar bulb-structure, but being, as regards its structure, quite more than an annual, whilst others, such as meadiolides and peruviana, take eight or ten years to develop from seed into flowering plants.
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To recapitulate briefly, I find that the subgenera which have been proposed in this genus are not, except in the case of Coontianum, really natural, or if they are natural as regards certain species, they are not so for others; I should therefore prefer to drop them entirely. The genus is not so large or so diverse as to require the maintenance of artificial groups such as these seem to be; and though I will indicate the affinities of the different species, together with the principal characters by which they may be recognized, I will not pretend to support an arrangement which cannot, as I think, be dissected by a careful observer without revealing imperfections and errors.

GEOGRAPHICAL DISTRIBUTION.

The Lilies have a somewhat peculiar geographical distribution, being found nearly all over the temperate zone of the Old and New Worlds, but, with the exception of three or four species (all of which belong to the Eulirion section), nowhere within the tropics. As far as our present knowledge extends, they are absent from the immense tract of country between the Caspian Sea and Western China, though the mountain-ranges of Turkestan may be found to contain some as yet unknown species.

The climatic conditions which seem to favour their growth are a moderately cold winter of short duration, and a warm spring and summer with considerable moisture. Thus we find them absent from those parts of Europe and Asia which are subject to prevalent or periodical seasons of severe drought. The two centres in which their headquarters seem to be in Japan, with about twelve indigenous species, and California, with eight or nine. The Himalaya Mountains, where the climate and other conditions seem very favourable, are not so prolific as might be expected, only five species occurring there, whereas in Europe we have seven, and in the Eastern States of North America one or two.

Except in the case of the Eulirion group (which are subtropical), none of the sections seem to favour one country or continent more than another, but the bulbs of Lilies belonging to different sections seem to have similar modifications in the same country. For instance, all those with stoloniferous bulbs are North-American, and all those with large oblique bulbs are Californian; whilst no European or Asiatic Lily has a bulb which could be mistaken for an American species by any one who was at all conversant with their peculiarities.

The annexed Map will show, as nearly as it is possible on so small a scale, the habitat of the known species, though it is of course understood that the boundaries of their distribution cannot be indicated by the colouring when several of the species occur together in one district.

It will be noticed that there are some curious anomalies in their distribution, which coincide with those of other genera which I have so far noted. In the Eulirion group we have a case which resembles that of many animals and birds in the same region. We find L. meyeriense and L. philippinense confined to isolated mountain-ranges, and separated from any of their congeners by nearly 1000 miles of sea, or by a great extent of land, which, being unsuited, on account of its climate, to the requirements of Lilies, is a perfect barrier against the extension of their range.

In the same way we find many birds confined to the isolated hill-regions of Southern India, whose nearest allies are in the Himalaya Mountains; but if the analogy between birds and plants holds good, I should expect to find Lilies in the high mountains of Java and Sumatra rather than in Java, whose fauna is less akin to that of South-eastern Asia than the fauna of Java, Sumatra, and Borneo.

Another point worthy of notice is the great difference between the Lilies of the Atlantic and Pacific States—thus establishing the fact, which has been so clearly shown by Prof. Asa Gray and Dr. Joseph Hooker, that the zones of distribution of plants in the United States are longitudinal rather than latitudinal, and that the flora of the Pacific States has much less in common with that of the Eastern States than would be expected.
Note —

In these maps the distribution of the known species is shown as nearly as possible with the imperfect knowledge we have of many of Central Asia where many blanks are unfilled. The yellow colour indicates the species belonging to the Martagon and Archelirion group of Baker. The crimson shows the species belonging to the Eulirion group (including the subgenus Cardiocrinum). The blue shows the Isolirion group as defined by Baker. Where two colours occur in stripes it is understood that two species are more or less evenly distributed over the region coloured. Where two colours occur in spots it shows that the species are very restricted or irregular in their distribution.
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The range of *L. pyrenum* is perhaps the most curious of all, and cannot be accounted for by any known cause. An inhabitant of the Pyrenees, and perhaps of Central Spain, it is also found in Bosnia and Transylvania, but is entirely absent from the whole of Central Europe (where it is represented by *L. pyrenaicum* and *L. cernuum*), and again reappears, in the same or a very closely allied form, in the mountains of Lazistan, at the south-east corner of the Black Sea.

The Lilies of North-eastern Asia are much more specialized, and have less resemblance to those of Europe than analogy would lead us to suppose. *L. formosanum* is the only one which can be called a local variety of any European plant by the most determined advocate for the unity of species, whilst a great majority of the birds, plants, and insects of that Siberia are remarkably similar to those of Europe. To the Lilies of North Japan, however, we find the closest similarity, several of the species, such as *L. Hansoni*, *L. avenaceum*, and *L. callosum*, being identical in Japan and on the mainland.

The following Table shows the habitats of all the Lilies:

| 1. *L. pyrenum* | Northern Japan, and probably Central China. |
| 3. *L. philippinum* | China. |
| 4. *L. wilhelminae* | Korea, and perhaps Japan. |
| 5. *L. nipponicum* | Japan. |
| 6. *L. millerioides* | Mountains of Southern India above 6,000 feet elevation. |
| 7. *L. longiflorum* | Southern and Central China, probably Formosa, Korea, and South Japan. |
| 8. *L. formosanum* | Islands of Western archipelago, and probably Japan. |
| 9. *L. undisium* | Northern and eastern parts of the Mediterranean, in several scattered localities, though few for independent existence. |
| 11. *L. pseudonipponicum* | Celebes, Borneo, and probably Japan. |
| 12. *L. bertieri* | Celebes, Borneo, and probably Japan. |
| 14. *L. pyramidatum* | Alps of Central Europe from France to Italy. |
| 15. *L. candidum* | North Eastern United States, and Canada. |
| 17. *L. oregoniense* | North Western United States, and Canada. |
| 18. *L. formosanum* | Central Eastern United States, and Canada. |
| 22. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 23. *L. formosanum* | Central Eastern United States, and Canada. |
| 25. *L. pyrenum* | Central Eastern United States, and Canada. |
| 27. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 29. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 30. *L. pyrenum* | Central Eastern United States, and Canada. |
| 32. *L. pyrenum* | Central Eastern United States, and Canada. |
| 33. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 34. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 35. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 37. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 38. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 40. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 41. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 42. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 43. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 44. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 45. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 46. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
| 47. *L. pseudonipponicum* | Central Eastern United States, and Canada. |
INTRODUCTION

CULTURE.

Though I have given directions for the cultivation of the various kinds of Lilies in the body of the work, yet I think some general remarks on the subject may be of use.

It is evident, from the large amount of correspondence which has appeared on the subject in the horticultural papers, that great diversity of opinion exists on the question; and though some writers profess to be able, by following out certain theories of culture, to ensure success, yet experience has shown that no amount of care or skill will enable us to grow Lilies unless the natural conditions of climate are favourable.

I know of no plants which seem to have such uncertain and inscrutable constitutions (if that term can be fully applied to plants) as Lilies; and I am more and more inclined to believe that in many cases they are not truly perennial. Whether this is the case or not, it is a fact (which no experienced Lily-grower will deny) that just as the perfection of development is attained, and the plant appears to be as flourishing as possible, a rapid decline in vigour comes on, without any apparent cause, and is followed by death, or by such complete exhaustion and collapse that any further pains and care are in most cases thrown away.

These remarks must, however, be applied to all Lilies, as there are several species (such as *L. candidum*, *L. hortiflorum*, *L. martagon*, and *L. uniflorum*) which may be grown with reasonable care almost anywhere, while others (such as *L. Odontophyllum*, *L. bulbiferum*, *L. odorum*, and *L. xiphophyllum*) have repeatedly baffled the skill of the most experienced horticulturists.

Before considering the causes of this want of success, it will be well to examine the general conditions under which Lilies grow in their native countries; and these are three points worthy of especial notice—

First, a considerable degree of summer heat is requisite; and though this may be accompanied by severe cold in winter without injury, yet we do not find Lilies thrive well in a cold, wet summer.

Secondly, we find that a good deal of moisture is necessary during the growing-season, either in the form of rain or mist. Long and severe droughts are not characteristic of any country where Lilies are abundant; or if they occur (as in parts of California and Southern Europe), we find Lilies only at considerable elevations, or growing in marshy and moist places.

Lastly, it seems to be almost universally the case, that the partial shade afforded by grass and weeds, or overhanging shrubs, is a necessary condition for their health; and perhaps this in cultivation is overlooked more often than any thing else. I have repeatedly found some varieties thriving in out-of-the-way corners, where they were almost buried in rank weeds and grass, and quite uncared for; whilst the same plants in rich soil, but exposed to the sun, were weak and unhealthy.

Protection from wind, from spring frosts, and from the baking of the soil by exposure to sun, I think, the most important points to be considered; and if combined with these conditions we can obtain moisture at the root, and a considerable degree of warmth in summer and autumn, there is little doubt of success with the majority of species.

Rich soil, however, is of no use unless it is sweet and well drained; as one finds, in pot-cultivation, that the roots will not occupy the good soil provided for them if it is not all since or vitrified. The constituents of the soil are, in my opinion, not so important as its condition; for though some Lilies, such as *canadense* and *superbum*, certainly prefer a considerable admixture of peat, and refuse to grow in soil containing lime, whilst others, such as
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The great drawbacks we have to contend with in England are:—the heavy cold rains of autumn and winter, acting on the soil at a time when the roots are most inactive, and thereby frequently causing them to rot; and the late spring frosts, which injure the shoots when first appearing above ground.

Perfect drainage will no doubt help the plants to endure the first of these evils; and artificial protection and mulching of light manure, leaves, or cocoanut fibre, will keep the ground from becoming dried up in summer.

The insect pests which affect Lilies most severely are aphides, or green flies (which are most injurious to them when grown under glass, and must be thoroughly kept down by fumigation and spraying), and a minute white insect which is generally found in abundance in the bulbs of unhealthy plants (but which, I believe, rather the result than the cause of disease). A fungal disease, resembling what is called "spoil" in peonies, is often charged to attack the leaves of Japanese Lilies in wet cold weather, and is, I have no doubt, caused by want of warmth. The disease which destroys so many thousands of Lilies each season does not, however, seem to be of a similar character, but is more probably caused by a lack of moisture at the roots, or the exposure of the bulbs to the sun. The sudden shedding of leaves, however, and death, which so often dispirit all one's hopes with this species, are very capricious: and perhaps, out of a hundred plants growing under precisely similar conditions, only twenty, thirty, or fifty may suffer, whilst the rest remain healthy and flower well.

Since the preceding was written, we have experienced in England one of the most protracted and severe winters, followed by one of the coldest and wettest summers ever known; and the results have been (as I anticipated) most disastrous to Lilies. My own losses have been so great that I have almost despaired of replacing them; and though in the drier soils of the eastern and southern counties I believe there have been fewer deaths, yet I fear the cultivation of these favorite plants has received a severe check. Perhaps the most remarkable case was that of a long bed of Californian Lilies, mostly varieties of L. californicum. These had become perfectly established in large clumps, and came up in the spring with unusual strength. After they had grown five or six feet high, and in most cases produced numerous buds, they became covered with blight, which spread rapidly over the whole plant. Week after week of dull weather had apparently induced a somewhat similar disease to that which destroyed the poplar trees so generally in 1879; and the result was that they died off either without flowering, or with only a few poor half-formed buds.

A parcel of these stems was submitted to the Rev. M. J. Buckland, whose experience in the fungous diseases of plants is unrivalled. His report, as printed in the "Gardeners' Chronicle," Aug. 28, 1883, is as follows:—

"Ever since Lilies became a favorite subject of cultivation, amateurs have mourned over their tendency to become spotty and unhealthy. From time to time especiers have been submitted by one of our most zealous and intelligent cultivators to the Scientific Committee of the Royal Horticultural Society, but without eliciting anything at all satisfactory. No treatment or change of soil seemed to have any beneficial effect, and our own experience is in exact accordance. Whether in the conservatory or in the open air, we have seen none to see specimens in a wretched condition, and sometimes belonging to the very commonest species. Nothing, however, has ever equalled, as regards condition, what we now have before us. The disease is no longer confined to mere spotting, but affects the whole plant, extending even to the bulb, which will soon be in an imperfect state as the plant itself. No portion even affected with the Peronospora was ever in a worse state than what we have before us. The condition may perhaps have been aggravated by the fact that, though the bulbs of stems weighed hardly above eight ounces, an extraordinary heat had been produced by their decomposition, which first attracted notice by the temperature of the letter which accompanied them. As the mass was so small, it was immediately
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It was conjectured that the heat must have arisen from a peculiar tendency to decomposition. The consequent change of colour in the cells penetrates deep into the tissues of the stem, and in parts the leaves are passing into a gelatinous mass. At the same time there is no certain indication of the cause. There is not a trace of any parasite except Asteroma polygonum, DC., in an early stage of growth; and even supposing that the spotting were connected with this (which is not impossible from what we know of Asteroma rose, which is so destructive this year), we fear that the closest consideration, as in so many other cases of disease, is not likely to suggest a probable remedy."

This somewhat reluctantly report is, I am afraid, all I can add to the question of Lily disease. Mr. G. F. Wicsox believes that exposure to sun and wind is the primary cause of the disease; but if so, how is it that we often see a quantity of Lilies in a greenhouse go off in just the same sort of way, and without any exposure at all?

Truly the matter is so present inexplicable; for it often occurs that, in the same house or bed where these sad deaths are taking place, other plants of the same species are flourishing exceedingly, and I know that even in the summer of 1879 Lilies did well in some places.

If I were about to recommend the cultivation of Lilies, I should build a house or frame on purpose for them, arranged, as nearly as possible, in the following manner:

A span-roofed pit should be made in a sheltered situation, with the ends facing north and south, sunk about three feet in the ground, and having an entrance on one end, with a narrow path down the centre. The lights should be made either to slide down and take off the light of a frame, or so hinged that the pit could be completely thrown open when desired. I think this important, because the complete exposure of the plants to sun and summer rains when not too violent is of more benefit to them than any amount of syringing or watering; and by lifting or drawing off the lights, and replacing them with some shading material in hot sunny weather, we avoid the burning and drying up of the soil, which is so difficult to prevent under a fixed glass roof.

No heating-apparatus would be necessary, as the slight frost which might penetrate the house in very severe weather would not injure the plants when in a dormant condition. The brick sides of the pit would be about a foot or eighteen inches above the ground-level, and might have ventilators of pierced zinc to break the draught. The beds would be built up with brick to about ground-level; and the height of the ridge from the earth should be not less than seven feet, or more if it be desired to grow many plants of Lilies auratum. The beds would be composed of a drainage of 9 or 10 inches of broken bricks, stone, or tiles, covered by some saucers of good soil laid over them, and filled in with about two feet of a compost consisting of about half light loam, one quarter coarse sand, and one quarter horse droppings; well broken up and mixed together. A part of the beds might be so made with saucers without peat, and another part should be composed of half peat and a quarter leaf-mould; but care must be taken that any leaf-mould used for Lilies is thoroughly rotten and free from fungal growth. Occupied coconut-fibre has been found an admirable substitute for leaf-mould, and may even be used instead of peat, though I should prefer the latter when of good quality. A good sprinkling of broken crocks, small stones, or clean coarse gravel may be added with advantage through the whole mass of soil; and a mixture of broken charcoal is also advantageous, as until the roots of the plants have occupied the soil there is always a risk of its becoming sour; and I believe that charcoal will not only prevent this, but also enrich the soil.

If the house could be planted with bulbs already well rooted and established in pots, I should prefer it, as among a number of purchased bulbs there will always be many failures, and there is some danger of their decay affecting the soil. If, however, the entire stock of plants was purchased, I would not plant them out till they had begun to make root, as it frequently happens that bulbs which have been lifted and severely checked lie dormant for several months; and when in this state they are likely to rot if kept at all wet.

In a part of the house a bed should be kept for planting plants in pots, so that newly imported bulbs,
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might he kept in small pots until they had made a good start. However large a bulb may be, and whatever depth of soil it may require when established, it is always good policy to start it in a small pot, and either shift it to a larger one or plant it out when well rooted. It is also wise to put more than one newly imported bulb in the same pot, or to plant a number together, where a good effect is desired, until their season of flowering has been ascertained. It frequently occurs that in a batch of imported bulbs of A. auratum and others, some will begin to flower in June and July, and others not before September, October, or even November, and the beauty of a pot or clump is somewhat marred when withered stems are mixed with those in flower.

When our Lily-house has been once established, it will be necessary to keep a most careful look-out for Aphides, which, if once allowed to get strong, will hide themselves in the young leaves, and do much damage unseen. A frequent and regular fumigation in spring and summer is essential to keep them in check; and if this be done regularly, the cultivation may be at ease, as neither thrips, mealy-bug, or red spider is to be feared in an unheated house. The lights should be thrown off whenever the weather is warm and pleasant, and whenever there is a nice warm rain. If some falls, a thorough good soaking of cool water should be given occasionally, to all plants which are well rooted and growing freely, and more moderate supplies to the rest. A good syringing when the house is shut up in the evening during the spring and summer months is also of great advantage.

During hot sunny weather the lights should be removed, and replaced by a shading of lilies or some similar material; and care must be taken on no occasion to burn the plants by keeping the lights on without shade; for though some of them will stand a great deal of direct sunshine without apparent injury, yet serious results often ensue.

As soon as the Lily grower is fairly acquainted with the various species, which only experience can make him, he will be able to select for himself those species which he prefers. Many Lilies are unsatisfactory plants to grow, and will probably disappear of their own accord in a year or two.

In purchasing bulbs, let him always select those which are plump and fresh, though of moderate dimensions; the largest bulbs are rarely the best. Let him endeavour to procure all home-grown varieties as soon as possible after they have been taken up in autumn; for if kept in sand or cocoanut fibre all the winter, as is often done by nurserymen, they must lose some of their moisture, and will be slow in beginning growth. With regard to imported bulbs, however, these are usually best which arrive in January and February, for if taken up in Japan early enough to allow them to be sold in England before Christmas, they are often imperfectly matured.

Care should always be taken, when purchasing bulbs during or after a severe frost, to see that they are not affected, as much loss is often incurred by this cause; and for sending bulbs to friends, at home or abroad, mild weather should always be chosen.

With regard to packing Lily-bulbs I can add little to what I have said in speaking of Г. philippinense. The great point is to observe the happy medium between too much moisture and the reverse, and to pack them so tightly that, without crushing, they may keep firm in the box.

During the last two years a new mode of cultivating Lilies has been suggested and put into practice by Mr. Wiusos, of Weybridge. This gentleman, believing that want of shelter was the main cause of failure in many instances, has laid out a piece of boggy woodland as a wild garden, and planted in it thousands of Lilies in various positions. Though I have no doubt that, if the various beds are kept from being overgrown by rank weeds and fern, many of them will prove very successful, the soil being very suitable for most of the species, yet I am inclined to think that the shade of the trees is too great at present, and that in a dry summer their roots will suffer in consequence.
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Considering, however, the very unfavourable season of 1879, and the want of time to establish the plants, Mr. Wissow's experiment promises a considerable measure of success, and is certainly a very interesting one. I am not, however, inclined to believe that he will succeed in establishing all or nearly all the Lilies in a wood as we have them in a garden; and, considering the varied nature of their habitats, it is not to be expected that he should in all cases succeed.

A theory which has been started and written on at great length by a correspondent of 'The Garden' named himself 'Duxepix,' as to the annual renewal of the bulbs of Lilies, is, I believe, founded on an entire misapprehension of the functions of their bulbs.

This writer, as far as I can understand his very lengthy communications, maintains that the bulbs of a Lily is completely absorbed by the flowering stem, and entirely renewed annually by a new growth of scales in its interior. He reasons, therefore, that the proper season to lift and transplant the bulbs of Lilies is immediately after the flowers have withered. The generally received opinion that the leaves of the plant have considerable influence in maturing the growth of the bulb, and assisting it to store up the necessary nourishment for the next year's flowering season, is ridiculed by this writer; but, in the correspondence which took place in 'The Garden,' his theory was proved, successfully disproved by several of our best Lily-growers. I believe myself that a continuous growth of new scales from the axis of the bulb is constantly taking place at all seasons, though much more actively in the spring and summer, and that this growth only comes when the bulb has attained its maximum development or when checked by removal, or by some other cause affecting its health. The development of the seedlings is certainly borne out this opinion.

The propagation of Lilies is effected in various ways:—first, by division of the bulbs, which increase rapidly in most of the European and in many of the American and Japanese species; secondly, by planting the bulblets which are formed in the axils of the leaves of L. tigrinum and L. bulbiferum, and at the crown of the bulb or on the base of the stem in many other species; thirdly, by seed, which, though a tedious and somewhat difficult process, is, in many cases, the only way by which an increase can be obtained. For instance, L. Washingtonianum, sibbaldianum, polyphylum, Caesalpi, philadelphicum, never, as far as I have seen, increase themselves by division or bulblets, whilst in the case of L. giganteum, candidum, tigrinum, and other Liliums, the bulb is propagated by seedling plants as examined by M. Donnermann. The propagation of Lilies is thus carried on by seed under natural conditions.

Germination takes place very irregularly in different species, and according to the time at which the seeds are sown. As a rule, it may be said that, if sown as soon as ripe, the seeds will germinate in spring; but under glass it is often sooner; and in the case of L. candidum and L. longiflorum, the seed is kept till the spring before sowing, it usually lies a year before germinating, and under these conditions no seed is sown in pots, the young bulbs are kept in frames, and the ground should be made tolerably fine under them. In pots in pots, the young bulbs will soon be starved, and as soon as strong enough they should be turned out into a frame.

The seeds of L. candidum which I ever sowed came up in September, at the same time as the autumnal leaves of the parent plant, and I have observed that the germination of the seeds of other bulbous plants usually takes place at the same time as the vegetation of the same plant. The seeds should be sown in boxes or in a frame, about a quarter of an inch deep, in light soil; and the ground should be made tolerably fine under them. If sown in pots, they must be kept plunged, or the young bulbs will soon be starved; and as soon as strong enough they should be turned out into a frame.

As seedling Lilies grow very slowly for two or three years, they should not be planted in the open ground at first; and careful watch must be kept against slugs, which will devour the leaves if sown in a single night. Most Lilies grow very easily over the soil and choke them; slugs are also very injurious; so that, from one cause or another, it is astonishing how small a proportion of seedling Lilies ever come to the flowering stage. One or
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Two species, such as *L. longiflorum* and *L. tenuifolium*, will flower the third season after sowing; but the majority, and especially the *Makrigea* group, take six to ten years before they attain flowering size.

It has been supposed by some that the constitution of Japan Lilies may be improved by raising them from seed in this country; and there is no doubt something to be said for this theory; but, putting aside the extreme care and patience which are necessary, I think experience shows that deterioration of size and colour is the usual result. Certainly the Japan Lilies which are cultivated by thousands in Holland are inferior in the size and tint of their flowers to those imported from their native country; and though I believe this is not the case in America, yet the climate of the New-England States is much more like that of Japan than is the climate of Holland or England. I have not noticed that the home-grown bulbs of *L. auratum*, which have succeeded admirably in the garden of Mr. Miers, are more easy to grow in my own garden than imported ones; and though I believe Miers, Watern, and Nornce have found the soil of their nurseries very favourable for the propagation of Japan Lilies, yet I believe we shall always be more or less dependent on a foreign supply to keep up our stock.

A fourth mode of propagation is by scales, and consists in pulling off the scales of sound bulbs and planting them separately, when, in some cases, small bulbs are formed at the base of the scale, which in time grow to be bulbs. This mode is most commonly adopted with *L. speciosum* and *L. auratum*.

The hybridization of Lilies has been attempted by many cultivators, but seems to have produced little result; and in many cases, where all means have been taken to remove the anthers of the seed-bearing plant before maturity, the produce has shown little variation from the parental type. Some of the varieties of Orange Lilies now in cultivation are supposed to have been raised by crossing *L. elegans* with *L. coccineum*, and plants are sometimes noticed in gardens which possess characters leading one to suppose that they may be hybrids between other species. The only well-known cases in which there appears to have been a decided success in crossing are those of *L. potenorum* (which is believed with good reason to be the result of a cross between *L. rhodoleuca* and *L. trifida*) and *L. Parkmanni* (which was raised in America by crossing *L. auratum* and *L. speciosum*). Other supposed hybrids have been mentioned in the gardening papers, most of which have an American origin; but from some cause or other they do not maintain their position, and either die away from a delicate constitution, or lose the characters which mark them. A wide field, however, is open in this direction to the patient observer, as there seems to be no physiological reason why Lilies should not be subject to the same laws as other plants.

* For further particulars on this subject see the account of *L. Parkmanni*. 
LILIUM PHILIPPINENSE.

THE PHILIPPINE LILY.


Lilium philippinense, syn. philippinense. Origin—Philippine Islands. Flowers: 2-3 flowers steams hanger, of which one is the male flower, the others 3- to 4-leaf. Leaves: 4-6 from 9 to 12 cm. Flowers: 4-5 flowers steams, ovate and ovate-oblong, borne on long peduncles. Flowers: 10 or more, white, with a yellow streak in the middle. Leaves: 3-4 to 6 leaflets, lanceolate, acuminate, spathulate. Flowers: 4-5 flowers steams, 10 or more, white, with a yellow streak in the middle. Leaves: 3-4 to 6 leaflets, lanceolate, acuminate, spathulate.

This beautiful plant has been known to same as a beautifully known other to

Liliaceae or Liliaceae, and not only are the leaves of the leaves of Lilia, and Véronen, of Chelsea, to express my sense of gratitude to these gentlemen for allowing me to use their plants for the illustration of this work before it has been distributed to the public.

The history is as follows:—Mrs. W. Wallis, the well-known horticultural traveller and collector, being in 1871 on a journey in the Philippine Islands, with the plants of which was the most numerous and lovely Orchids for which those islands are celebrated, discovered and sent to Messrs. Véronen, at the plant in question, which flowered, for the first time in Europe, at their nursery in 1873. It was described by Mrs. Walker in the ‘Gardener’s Chronicle’ for August 20, 1873, where a figure of it is also given. The occurrence of this Lily in a country where the vegetation, as far as known, is of an essentially tropical nature, though quite unexpected, is not so extraordinary as it at first appears—the Philippine Islands having, with regard to the geographical distribution of the flora, a number of points in common with China, the Himalayas, and Southern India, in all of which regions Lilies, and Lilies of the same section (Delphinium), are found. With the exception of L. philippinense, however, it is the only Lily found within the tropics (unless, perhaps, L. longiflorum, which occurs in Surinam, is another); and these are both native of high mountains, where the climate is very different, both as regards temperature and moisture, from that of the surrounding plains.

Through the courtesy of Mr. Wallis, I am enabled to add some information as to the discovery and habitat of this plant, and translate from his letter as follows:—"It was in the beginning of July, 1871, when I was in the district of Biscuit, on the island of Luzon, at an elevation of 7000 feet, that I was surprised with the adjacent discovery. The spot required for my special culture, as I found in the same place in Muscat, with pure white flowers, and quite marketable as the Lily, to be brought into cultivation.

"If the Lily is said to be the emblem of peace and modesty, it is indeed true of this charming new species. The size of whose flowers is, in proportion to that of the stem and leaves, greater than any other. Its deep blue, when hardly any other flower appears, it is found self-sufficient alone in the grass, and lends its presence as much by the sweetness of its perfume as by the dazzling whiteness of its flowers. The stem, hardly thicker than a
spall, and clad with unusually fine and grass-like leaves, is not more than from 6-18 inches high, while the flower, which is rather fish-like upwards than horizontal, is from 8-10 inches long. It seems to prefer shade where the soil is poor rather than rich, and grows by hundreds in small patches, partially shaded by overhanging trees. The soil is of a very light nature, allowing the abundant moisture to pass off freely, and is composed of a mixture of beach, decomposed trachyte and coralline limestone. The trees which grow in the vicinity consist of species of Quercus, Ficus, Rhododendron, Sibrouxias, Mallophyllopsis, Melastomaceae, Gesneriaceae, and many stately ferns. The subalpine character of the situation, however, is better shown by the herbaceous plants, among which are introduced species of Thalictrum, Compositae, and orchids. Lower down the mountain ferns and other tropical plants are abundant. Among these there are Cypripedium arguz and Cypripedium reconditum, which are included in the Malaquis. With regard to the probability of other species of Lily existing in the Philippines I can say but little, the mountain-ranges of these islands (which attain the elevation of 10,000 feet or more) being almost unwalled. In the district of Mindanao and Mindore, owing to the divided habits of the natives, it is almost impossible to travel, though there are doubtless many discoveries might be made there. The only other high mountains I ascended were the Malakaut range in Luzon; and here I was disappointed by finding nothing so remarkable as in the district of Benguet.

I was told that the bulbs of L. philippinense when brought to the warm climate of Manilla would soon decay; but, thanks to the vitality of their scales, each of which seems to have the power of producing a new bulb, I was enabled to bring them safely to England.

I would here add that the main point of interest in packing the bulbs of Lilies for transport is to protect them from heat and excessive moisture, which soon destroys them when deprived of their roots. Thousands of bulbs have been lost from ignorance or intention to this fault, but, on the other hand, care should be taken to allow them to become only in consequence to the air, which vaporizes the outer scale of which they are composed. No advantage is better for packing small quantities of Lilies than to establish a regular, which can be obtained in most parts of the world. Failing this, light vegetable oil, not too neat, or an essential is the best thing; and care should always be taken to pack them so tightly that they cannot be shaken in the box. In cases where the plants cannot be allowed to remain until their roots have naturally decayed in autumn, it is better to transport them, with the roots as few as possible, to some shady spot in a garden until they are at rest, then to pack and send them off when in full growth. Before packing for a long journey, especially if hot climates have to be traversed, it is a good plan to expose them for a few days to the air, which will dry up the superabundant moisture of the outer scales and render them less liable to injury. However carefully packed, most Lilies are still injured by a long transport, and do not make healthy growth for a year or more after they are replanted. Growers of Lilies, remembering this, need therefore not be disappointed if the flowers of some new and highly prized introductions are poor and colorless, or perhaps altogether absent, for a year or two—but patiently waiting till the plants have recovered their natural vigor, will be rewarded by a display which cannot fail to give pleasure to those who can appreciate their delicate beauty.

With regard to the culture of L. philippinense, I am informed by Messrs. Vere that the bulbs are somewhat delicate, and grow best in a warm house. They should be kept in small pots plunged in a bed of fibres or soil. When growing they require, like other Lilies, abundance of moisture, and when in rest should be kept plunged in a cool house where the pots, without water, may never become quite dry. In February the bulbs will start into growth in a temperature of 55-60°; and the delicate stems then begin to show the character of their narrow leaves. The leaves produced by small bulbs or scales are much like the primary leaves of L. concolor. It is to be hoped that the stock of this plant, under the tender care of Mr. Dwyer (who is undoubtedly one of the most skilful gardeners of the day) in all delicate operations of plant-culture), will soon be sufficiently increased to enable Messrs. Vere to send it out. In the mean time let us hope that the islands whence it came may not long remain, as at present, almost a terra incognita to gardeners.
LILIUM HANSONI.


L. maculatum et avenaceum, Moore, Florist, 1874, p. 1081; Gard. Chron. 1874, p. 221, t. 47.

L. maculatum, Bot. Mag., pl. 612.

L. avenaceum, Maxim. in Gartenfora, 1865, p. 290, in parte y sulis 3-1 pedalis glaber teres n
а patentin sessilia, reliqua sparsa, 4-5 poll. longa, supra medium 8-12 lin. lata, е
positi, vel in umbellam congesti, pedicellis erecto-patentibus, Junceolatia, Perianthium 16-18 lin. longum splendido rubello-aurantiacum, cris lanceolatis melio 4-5 lin. ішін profundo faleato-revolutis, facie dimidio inferiore purpuratis, for bro profund


Bulb large, robust, formed of many closely adherent white scales, resembling that of a Tiger Lily. Stem 3-4 feet high, of different bearing 3 or 4 whorls of leaves at considerable intervals, the lowest one some way from the ground. Leaves crowded when many in a whorl, narrow when few, 3-6 inches long by 4-1} brend, oblane n
ved, dark shining green abore, paler beneath; upper leaves scattered, much smaller. Flowers about 4-10 or mon irregularly narrow, 4-5 lines long: pollen yellow. Ovary clavate, deeply sul

The plant was first discovered by Professor Maximowicz, the distinguished Russian traveller, in Siberia and Japan, about the year 1860, at the Victoria Gulf in Eastern Manchuria, the southern limit of Russian territory in those regions. He did not, however, especially notice its distinction from L. maculatum, which is indeed very slight; so that it is mentioned in the "Gartenfora," 1865, p. 290, as a yellow-flowered variety of that plant. In 1868 or 1869 two or three bulbs were sent to the garden of the late Baron von Steenwedel at Leyden, and were purchased a year afterwards by Mr. Leutwyler, who saw at once that it was a very distinct species. He grew the plant and named it after Mr. Hanson of New York, who has one of the finest collections of lilies in the world.

Before this became known, however, Mr. Whittier had bought one or two bulbs in an odd lot at Stevenson's sale-rooms, where many thousands of lilies are annually disposed of, not knowing exactly what they were. Early in the following spring he was gratified by seeing a stem shoot up before any other lily had begun growing, and in due time the flowers were produced. He exhibited the plant in June at a meeting of the Royal Horticultural Society and it was figured soon afterwards in the "Gardeners' Chronicle" under the name of maculatum, by the "Florist and Pomologist" as L. maculatum, and in the "Botanical Magazine," pl. 612, as L. maculatum (of Thunberg), with the synonym of avenaceum.

Mr. Leutwyler, however, on seeing these figures at once recognized the plant, and wrote to point out that though the flowers and stem might be very similar to those of maculatum, the bulb was remarkably different.
I have verified, by personal examination, having seen excellent specimens of the latter with bulbs in several
herbaria, and though it is not now in cultivation, there can be no doubt that Mr. Lecomte is right.

The habitat of the plant, however, still remained unknown; for though it is certainly found in Japan, no
taxonomist had met with it in a wild state, and it might be, like several others, only introduced to the gardens
of Japan.

A few months ago I was able to show a plant of this species in flower to Professor Maximowicz, who
at once recognized it as what he had discovered at Victoria Gulf and previously supposed to be L. arenaceum.
It is quite possible that the plant may have been known before, as it was certainly sent to America several years
ago, and has been again received by Mr. Hasson direct from Japan; but the mystery which hung over its
origin has now been, I hope, satisfactorily cleared up.

I may add that the name of maculatum (Thunb.), which was thought to have been given to this Lily,
cannot stand, the type specimen in Thunberg's own herbarium (which, through the kindness of Professor
Pors, of Upsala, has been sent to the Kew herbarium for examination) being nothing more than a garden
variety of L. elegans.

I have seen, in a book of drawings of Japanese Lilies very well and truthfully done from nature, by a
native artist, unmistakable representations of both L. Hassonii and L. arenaceum—showing that they are recognized
as distinct by the natives of that country, and may both be found in the northern parts of the Archipelago.

The culture of this plant is so easy that I have no doubt it will soon become better known in gardens.
A small bulb stood the severe frost of last winter in my garden without any protection, and though it does not
ripen seed this year, it may be propagated by means of scales and offsets. It is the earliest in growth of any
kind I know, and succeeds well in a peaty soil which does not become hot and dry in summer. The only seed
which has been obtained by Mr. Lecomte germinated at once, which is not the case with the Martagon Lilies,
from which this plant is also distinguished by many characters of habit, habit, and shape of flowers.

P.S.—From information I have quite recently received from Mr. Hems, an American gentleman long
residing in Japan, I have no doubt that the plant is found in the northern part of the Japanese Archipelago,
and I am promised by him a full account of all the Lilies of that country in their wild state, about which we yet we
have very little knowledge.
LILIJUM POMPONIUM.

THE POMPONE LILY.


The Pompone Lily, though well known by name, is by no means a common species. I have indeed great doubts if the true plant was known in our gardens until recently, and is one of the oldest known to science.

To Mr. G. Maw, of Benthall, whose frequent excursions to all parts of Southern Europe in search of plants have made him so well known of late years, must be attributed the credit of reintroducing the real L. pomponiwm of Linnaeus, and of pointing out its distinction from the common garden plant of that name. It is true that Mr. Buxton, in his last edition of the genus Lilium, the true variety of which is the pomponiwm of Linnaeus, as a variety only of the latter; but I think that if he had at the time seen such a plant as I have figured, in a living state, he would have allowed its claim to specific distinction. I am indebted to Mr. Maw for the plant from which the drawing was made.

Mr. Maw, whose large quantity of bulbs of the bulbus of this Lily sent to England, etc., informs me that it is found in the following localities, all of which are in the Maritime Alps:—Lantosca (at about 1,000 ft. elevation), mountain near Montone (at about 2,000 ft., elevation), Vent, Grumonesco, Cailizione, Sarzago, Alpin, St. Vallier, Col. dell'Ortigera, Valle del Minskil, &c., &c.

His collection is perfectly simple; and, like all the Martignac group, it only requires to be planted in good soil and left undisturbed, when it will increase rapidly and flower freely every year. I am glad to hear that Mr. Burrard, of the garden at Benthall, has succeeded in obtaining from its native country a good supply of this pretty plant, which will soon become a general favourite.
cross; but they have invariably turned out to be of the *speciosum* type. I have likewise flowered some seedlings raised from the self-handled seedlings mentioned, making the *speciosum* the male parent; and they have all shown on flowering the *speciosum*-shaped, but very much in their markings, some being with red bands and some with yellow. All those crosses were carefully performed, the mothers being all removed before any pollen appeared on the stigma of the flowers crossed. I have likewise flowered between 400 and 600 seedlings of the *speciosum* and *aurantiacum* varieties within the last few years, and it is remarkable how they vary in shape of the petals and markings, but, as mentioned above, they have never shown any decided cross between the two kinds. Of the *speciosum* type I have raised pure white kinds and pink-spotted ones on a white ground, like *speciosum punctatus*, up to a very dark-spotted on a deep crimson ground. In raising seedling kinds of the *aurantiacum* and *speciosum* kinds it is very easy to see if there is a cross between them, by the shape of the leaves and markings on the stem, long before the flowers appear—the leaves of *aurantiacum* being much narrower than those of *speciosum*, and the stem spurted.

**LILIIUM AURATUM, var. WITTEII.**

**WITTES LILY.**


L. auratum. Hort.

Of the origin of *Lilium auratum*, var. Wittei, I can say little. It was first described by Prof. Sunixoan, of the Botanic Gardens at Leyden, as a distinct species, from a plant in the possession of Messrs. J. Van de Lichten & Son, of Rotterdam, who received it from Japan.

It was then purchased by Mr. J. H. Knibb, of Haarlem, who is probably the largest grower of Lilies in the world, and to whom my best thanks are due, not only for the kindness with which he has always placed all my floral and botanical knowledge of Lilies and bulbous plants generally, but also for allowing me to have the Plate, which was drawn from his plant, published for this work. Curiously enough, at the very time that Mr. Price was engaged in drawing a half of an auratum, which had perished in the preceding winter among a lot of seedlings, each bearing one or more flowers so exactly like the figure of Mr. Knibb's plant, that they can be in doubt of their identity, what has been grown and published, on more than one occasion in England as *Lilium villosum*, is, I think, the same, or almost the same, variety, and I was informed by Mr. Watson, of Wyverdene, that, out of forty seedlings he raised from *L. auratum*, three produced flowers nearly resembling this. The latter is a conclusive proof of the specific identity of the plant with *L. auratum* and, though quite rare at present, I believe it will turn up every now and then among the members of both, which are annually imported from Japan, and which I believe are mostly wild seedlings, transplanted and cultivated in gardens on purpose for exportation. A full account of *L. auratum*, together with other distinct varieties, will be found in a separate article.
The history of *L. Parkmanii* is as follows:—It was raised by Mss. Frances Parkman, of Jamaica Plain, Mass., President of the Massachusetts Horticultural Society, who gives the following interesting account of it in the “Gardeners’ Chronicle” by 1865, p. 265—

—I sent, last year, to Mss. Anthony Warren a small bulb of a hybrid Lily, raised by me between *L. auratum* and a deep-colored variety of *L. lancifolium* (speciosum); the latter was the male parent.

Impregnation took place readily; and the young bulbs were planted in the open ground for the first time in the spring of 1869. There were about fifty of them. Several, as they grew, showed the peculiar spotted stem of the male parent; but when they set flower-buds, as nearly all of them did in the same season, I could distinguish the features of *L. auratum* in only one of them. The rest, in bud and flower, appear to be merely *L. lancifolium*, quite unaffected by the pollen of the male parent.

“The one case alluded to was a remarkable exception. The flower opened two days earlier than any of the rest; its colour was a deep red; it had the fragrance of auratum, and resembled it also in form. This first flower measured 9½ inches from tip to tip of the petals. In the following year there were several flowers of which the largest measured 11½ inches. The bulb was then in a pot. As no special pains or skill was applied to its cultivation, I have no doubt that the flower might be grown to the diameter of a foot.

“This hybrid was the most successful result of a great number of experiments tried by me in the cross-fertilization of Lilies. This genus is certainly remarkable in the propensity of the male parent, and the influence of the female parent, and this the influence of the male; then I impregnated L. lancifolium and its variety *L. Speciosum* with the pollen of *L. auratum*, *L. lancifolium*, and six or eight other Lilies. The authors of the impregnated flowers being carefully removed before they opened. *L. Speciosum* bore four bulbs in abundance; but the resulting plant did not differ perceptibly from its female parent, showing no feature of the male. I removed its anthers, and fertilized it again with *L. auratum* and *L. lancifolium*, thinking that the influence of the male might appear in the second generation if not in the first: but the double impregnation produced no effect. The same result followed a similar experiment with *L. auratum* and *L. Speciosum*: in this case, also, the flowers resulting from the first impregnation was again impregnated: the result was a very scanty crop of seed; but this seed produced a plant in which no sign of the male influence was visible.”

In 1875 the plant flowered in the celebrated Rhododendron-nursery of Mss. Anthony Warren, at Knap Hall, where it was drawn by Mr. Priest for the "Florist and Pomologist," and described by Mr. T. Morrison, in whose name I am indebted for permission to use that carriage for my work. It is without doubt one of the grandest Lilies known, but, I am afraid, will never become common in this country, as the vast of confusion shown by a large majority of the bulbs of *L. auratum* makes them very liable to go off suddenly without apparent cause; and, when once out of health, they are very difficult to recover. I am glad to hear that it has got into the hands of Herr Luckhaupt, as, if it is possible for any cultivator to improve it, it will be done by him.

With regard to the little-understood subject of hybridization among Lilies, I would call attention to a communication by Mr. Fellows, of Wellesley, to the "Gardeners’ Chronicle," 1876. He says:—‘For the last seven or eight years I have been trying to effect a cross between a dark seedling *L. speciosum*, and a mistake *L. auratum* with a deeper red, making the speciosum the female parent. I have flowered some of the seedlings from the
LILY LILUM PYRENAICUM. THE PYRENEAN LILY.


Both in garden and wild, this species is of great ornamental value. In the Pyrenean Alps it is found in meadows and in rocky places, often in great abundance. The flowers are large and showy, and the foliage is evergreen, being somewhat glossy and dark green. The flowers are white, tinged with pink, with a yellow spot on the inner side, and the petals are recurved. The fruit is a capsule, containing numerous seeds. The plant is propagated by division, and is very hardy. It is a native of the Pyrenees and is found in the mountains of Spain and France. It is a beautiful flower, and is very popular in gardens. The flowers are large, with a yellow spot on the inner side, and the petals are recurved. The fruit is a capsule, containing numerous seeds. The plant is propagated by division, and is very hardy. It is a native of the Pyrenees and is found in the mountains of Spain and France. It is a beautiful flower, and is very popular in gardens.
Other large hemispheres in cultivation here, and should not be neglected. I did not see it in its natural state, but I certainly appeared to have much larger flowers than usual.

The cultivation of this species is parallel. If planted in some half-shaded portion of the garden and left alone, it will thrive well and perhaps be more appreciated than if planted in a permanent position. It is easily increased, if desired, by seeds or offsets.

An un公诉ed variety is described in Parkinson's 'Theatren,' No. 33, 1818, 'Phalaenopsis venosa non gentilissima.'

P.S.—Since the above was written in 1876, I have received the type specimen by Corvet, Rome from Brussels. It proves to be identical in all respects with L. pavonina. The type collected in 1877 in L. flava, by Henr. Cogniaux, at Vercorique in Tunisia, which has grown one season in my garden but has not flowered, also appears to be very similar, but according to M. Viollet, it is more robust and sweet-scented. Mr. Veitch also received the plant from Vercorique, from M. Viollet, in Tunisia, and sent me the flowers for comparison, but I could see no difference between them and the type. Whether this is the L. pavonina of Groseiliez (F. Dufresne, 1825) is doubtful, but according to his description, it has broader leaves, and may be more properly referred to it. It has been by M. Viollet to L. odontophorus. The geographical distribution of the species, however, is very curious, as it is found neither in the Western Alps, where it is replaced by L. scribonia and L. pavonina, nor in the mountains of Styria and Carinthia, where L. odontophorus is found. It is therefore only in Tunisia, Algeria, and Bejaia, at least a thousand miles from the Pyrenees. Judging from anatomy, it is possible that Bechhofer's L. pavonina, a dwarf species of which from the mountains of Tuscany I have seen in the genus Inariun, may really be the European species, and not, as one would at first suppose, a variety of the Carinthian L. odontophorus.
LILIJUM TESTACEUM.

THE NANKIEN LILY.


LILIJUM TESTACEUM. THE NANKIEN LILY.


LILIJUM TESTACEUM. THE NANKIEN LILY.

LILIJUM TESTACEUM. THE NANKIEN LILY.

THE NANKIEN LILY.

This text is a natural reading of a page from a document. It includes information about a plant called Liliium Testaceum, also known as the Nankien Lily. The text describes its appearance, origin, and some historical context related to its cultivation in Europe.
Martagon group it prefers bone to moist soil, and resists the hardest frosts with impunity. It flowers about the beginning of July, at the same time as the White Lily, and about fifteen days sooner than the Trumpet Martagon. The bulbs are very large; but as there is nothing remarkable about their formation, I have not thought it necessary to figure one.

I have recently learnt from my friend Major Trevor Clarke, of Wellesley Place, one of our most experienced and scientific horticulturists, that he has produced a Lily hardly distinguishable from the ordinary Martagon, by fertilizing L. candidum with the pollen of L. martagon; as, however, he raised plants in the same year from seed produced by L. candidum, there is but a possibility of these having become confounded, though he has little doubt of the correctness of his statement.
LILIAM DAVIDII

DAVID'S LILY.

A. Emery, Druggister, MC.


33a. This plant would be called "Manila" in the Philippines.

This new species of Lily which I have represented was discovered by the Amédé Amédée Davidi in the month of June last, in the country of the Mandes, district of Yanthan, a region on the borders of Tibet and China, and is about lat. 53° N., long. 101° E. This enthusiastic missionary, whose travels in the interior of China have added more to our knowledge of the flora and floras of that country than those of all other naturalists together, with the exception of Mr. Swinhoe, on returning from the second and most important of his journeys, brought with him, among a large number of new and rare plants, fruits, and minerals, a single dried specimen of the Lily which now bears his name. His collections, which were deposited at the Horticultural Society of Paris, are all unslated and undescribed; but owing to his kindness and that of Professor Dumont, I was enabled to go over all his relics, and fortunate enough to find several of the flowers of which in China was previously unknown.

M. Dumont, he pointed out to me the peculiarity of the species, under notice, which he was at first unwilling to disclose from a simple and too perfect specimen. As, however, a careful examination shows that it can hardly be mistaken for or united with any other species, I requested him to do so, and he consented after deliberation. A careful drawing of the plant was made by M. Fouqué, and has been faithfully lithographed by M. Prunières, so that though the colour of the living flower may be brighter than the figure, the latter is in other respects an exact representation.

I should not have departed from my promised course of leaving this plant only, but there was the last hope of getting other specimens or bulbs of this plant; but as its native country has never been visited by any European, except the Amédée Davidi, and is, from its inacessibility and the hostility of its inhabitants, likely to remain for many years a terra incognita, there is but little hope of the plant being procured again. The Amédée Davidi informs me that the mountains of the district are of great elevation, reaching 15,000 feet or even more. The lands, as well as the arms, bears a strong resemblance to that of the Eastern Himalayas—Tibet—Upper India, Manipur, Manipur, Manipur, Manipur, Manipur, Manipur, Manipur. Nearly all the most characteristic Himalayan genera are represented, and indeed there are two plants belonging to the Himalayan genera, though of the opposite sex. Liliium digitatum and L. polyphyllum, both of which are Himalayan plants, were included in M. Davidi's herbarium, and prove that the climate and soil must be of a very similar nature to that of many parts of Nepal.
LILIUM POLYPHYLLUM.

THE MANY-LEAVED LILY.


Hab. Regio in Himalayis occidentalis, alt. 6000-10000 poll. (Beccari / Klotzsch).

This long and thick-stemmed plant, much exceeding the usual, consists of a few thick compressed scales simply pointedit at the top. It is very thick, stately, and straight. Flowers 2-4 feet high, globular, hortorum sortes, or sometimes wrapped in loose bracts, 6-7 feet long, very good material for making new plants. Flowers 12-15 inches long, Petala 2-4 inches long, covered with a pair of large leaves. Petalae 2-3 inches long, convexly rounded with purple edges, exerted from the stamens. Style 5-6 inches long, stigma 10-12, fruit 6-7 inches long, capsule 12-15 inches long, rather neatly angled, with a distinct neck.

This rare Lily, the only one of the Martagon group yet found in the Himalayas, is very little known at present. discovered forty years ago by Mr. Roxburgh, in the province of Kumaon. It has since been gathered by several travellers in the western parts of the mountains; and though it has not been noticed in Nepal, I have reason to suppose that it occurs in Sikim, and even further east, on the frontiers of China and Tibet, where a plant which I believe to be identical was collected by Mr. Andrew in 1869, from the native haunts we know but little of the Martagon Lily, it is not yet known to be either a bulbous or a tuberous plant.

The first sign of growth is a true leaf, the thickened base of petiole forms a minute hat the paper of the bulb may be distinguished at its earliest stage, the-year seedling of L. polyphyllum is very rare, and the plants which I have raised, though sent from Sikkim, I have been able to introduce to the Edinburgh Botanic Gardens, where it was raised, according to Mr. McNeice, the Curator. I now have it in flower in October 1873, under the name of Fritillaria polyphyllum, and raised some of the seeds given to me by Mr. McNeice, which enabled me to observe two curious facts respecting this species:—first, that it is a bulbous plant, and secondly, that the spathe does not appear above ground, but, as in the case of L. convallaria, the first sign of growth is a true leaf, the thickened base of whose peduncles forms a minute scale. secondly, that the pedicel—scale of the bulb may be distinguished in its earliest stage, so that a one-year seedling of L. polyphyllum remains the same species, and may be easily distinguished from any other species whose development from seed I have observed.

The specimen here figured I was indebted to Mr. G. Macar, of Berdell, who, I believe, the first to have collected the plant in England, and for the drawings of the bulb and capsule to Mr. Macar, the Curator of the Edinburgh Botanic Gardens, where it was raised, according to Mr. McNeice, the Curator. I now have it in flower in October 1873, under the name of Fritillaria polyphyllum, and raised some of the seeds given to me by Mr. McNeice, which enabled me to observe two curious facts respecting this species:—first, that it is a bulbous plant, and secondly, that the spathe does not appear above ground, but, as in the case of L. convallaria, the first sign of growth is a true leaf, the thickened base of whose peduncles forms a minute scale. secondly, that the pedicel—scale of the bulb may be distinguished in its earliest stage, so that a one-year seedling of L. polyphyllum remains the same species, and may be easily distinguished from any other species whose development from seed I have observed.

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LILIUM GIGANTEUM.


Bulb globose, cormous, perennar, 4—5 f. long, covering itself mostly subterraneeus. Colors 4 —5 petals with outer violet blue 1 petal pink. Petals pendulous, with rolled or waved margin, subulate, or ovate, acute. Sepals oblong, long. Staminodia 4 or 5, oblong, short, obtuse, often of various colors. Ovarium subglobose, 3—5 seeds. Seed large, rounded, smooth, shining. Germination requires 6—8 months. Flowers from June to August.

Hooker and Bentham report on L. giganteum in their Cryptogamie, pl. 6, f. 3; 7, f. 5, f. 21, p. 176; flores subterranei, foliis longioribus, petals adnatis, ovario ovato oblongo, staminibus octo, seminibus 2—3, f. 3, p. 281, f. 4, p. 284. Bentham directs attention to it being 5—6 feet high, with a rosette of leaves, 1.5—2.5 feet high, with flowers, 2—3 feet high, with seed pods. It is a most valuable ornamental plant.

It is a native of Nepal, from which it is believed to have been introduced by the British. It is a most valuable ornamental plant, growing from 5—6 feet high, with a rosette of leaves, 1.5—2.5 feet high, with flowers, 2—3 feet high, with seed pods. It is a most valuable ornamental plant.

The Liliaceae, which are here described, though not perhaps the most beautiful of its genus, is certainly the largest, and well deserves the name of giganteum given to it by W. H. B.
In 1817, during my journey in the almost unknown mountains of Mysore to the shores of Tibet, I saw this noble plant growing abundantly in the Lachen Valley, at about seven thousand feet elevation. Here it flourishes in a climate which may best be described by saying that for many months it was impossible to dry thoroughly one's clothes, or holding the mantle, though by means we equal to that of the Khasia valleys of Sikkim, is almost continuous from April to October, and though the mornings are often bright and sunny, a day without rain is quite rare. In this state though not extreme climate the vegetation is of the richest and most varied description. Nearly all the most beautiful gardens of the north temperate zone throughout the world are here represented by one or more species; and in addition to these, many plants belonging to the tropical Malayan flora are abundant.

Mr. Hooker, the only botanist, and indeed almost the only European, who has visited this wonderful valley, endeavored amongst the plants which he observed (see "Himalayan Journals," vol. ii, p. 380) — of K. American genera, Eustoma, Papaver, Meconopsis, Stephania, Hypepogan, Tilia, Acer, Tilia, Phellodryson, Trillium, and Chrysanthemum. Of Japanese and Chinese genera, Camellia, Azalea, Rhododendron, Hydrangea, Schizoneura, Kalmia, and Euphorbia. Of Malayan, he found many Hibiscus, and Curcuma, Erythroxylon, Gossypium, Mimus, Coleogyne, Calanthe, and several Scutellaria plants. Besides these were splendid representatives of many well-known European genera, as Centranthus, Gentiana, Solanum, Maclura, Cotoneaster, Leucocarya, Fruticifera, Primula. The Gigantea Lily towers in all its glory where most of the other herbaceous plants, covering the site for yards around with its sweet perfume in the month of July, and lying buried under the snow from December to March, when it again bursts forth forth with flowers.

Though so long known to botanists, this plant was not introduced into Europe till 1827, when Comte Masson sent seeds to the Botanic Gardens, Glasnevin, Dublin, which were successfully raised and sold by distantly distributed. It had previously been sent over several times, but owing to the long time it takes to germinate, had probably been thrown away as bad. The plant first entered at the Wesley-Hall Nursery, Ednamhead, where Mr. Coxson raised it from seed. From one of his plants it was figured and published in the "Botanical Magazine" of 1851.

Since then it has become very well known, and having been found perfectly hardy in most parts of England, is to be seen in the gardens of all who can appreciate a really fine plant. Among the places where it is established in great perfection, I may mention the gardens of the Duke of Hamilton, at Ednamhead, and of the Earl of Wusterson, at Merton in Norfolk, where, the Rev. Hanapi Currie informs me, it is planted on both sides of a broad avenue, and ripens seed abundantly every year.

The tendency to grow very early in the spring, which is shown by this as by the majority of Himalayan plants and trees, makes it advisable to expose or cold-frame, to prevent the leaves from being cut off by late frosts; and if the summer is dry, regular watering and spraying will be found very advantageous to it. The offsets, which are freely produced on the old bulbs, should be separated as soon as they are large enough, and planted separately, as they prevent the large bulbs from flowering so strongly as to allow them away their vigor. This Lily may also be successfully cultivated in a large pot, though its great size renders it less desirable than many species for this purpose. The seed, which is freely produced in autumn, should be sown, as soon as it is ripe, in pots of light soil, and will germinate in the following spring, though it may take from one to two years before coming up. The accompanying drawing was made from a plant which flowered in my greenhouse in the end of May 1870, and was subsequently published in the "Botanical Magazine" of 1871.

The development of this plant from the seed has been most carefully studied and described by DeCandolle P. Delaroche, of Paris, in an elaborate paper published in the Journal of the Central Horticultural Society of France, 1874, pp. 544–561. By his kind permission I have reproduced the drawings by which this paper is illustrated, and will publish them with full details at the end of my work.

I recall it to the memory of the humble Valley, in March 1829, as a very dark, damp, stormy, moist, loamy land; but in the very cloudy climate it was said as if it were an English home in the height and other regions of the Lakes-Galloway districts. I am told to the last place, but I believe that it increased the perilously in 1855 and 1856, and has been doing anything which he said — that shows how well the name and plant is all of which was pointed out for myself.
LILIUM PHILADELPHICUM.

THE PHILADELPHIA LILY.


This is a native American species, resembling the Liliaceae, and common in all the middle and western States, from the Great American Lakes to the mountains where there are open glades and the sandy soil and burns.

In cultivation I have found that it is more indifferent to drought than most of the other species, and will grow in many places where it planted in pastures with frequency, provided it is cultivated

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and dried. I have, however, cultivated it in pots in past cell with great success, and have obtained good seed from it by keeping the pots rather dry in a warm greenhouse. The seed germinates readily, and grows more quickly than usual; and as I am rather doubtful whether the bulbs can be increased freely by means of offsets, I think this will be the best means of propagating the plant.

The growth of the bulbs in this species is peculiar, and unlike that of any other Lily, though it has some analogy with A.orners. It is a curious fact that all the American Lilies, though varying remarkably among themselves, differ entirely in their bulb structure from those of Europe and Asia, and the same peculiarity is widespread among the American Fritillaries, which, as far as I know them, have bulbs composed of small white scales loosely attached to a solid central axis, from which the stars sprout. Of all the Old-World Lilies and Fritillaries, only one, namely Lilium ornatum and Fritillaria lanceolata, resemble their American congeners in the formation of their bulbs; and both of these are restricted in their geographical limits to the shores of North Eastern Asia, which have many affinities, both botanical and zoological, with the Pacific coast of North America.
LILIUM DAVURICUM.
THE SIBERIAN LILY.

* L. davuricum, Gard. Mag. 1710; Regn. Hort. Roth.; t. 710, pl. 72; t. 359; Boiss. Imm. Bot. 1865. 80; Liliaceae, Gen. 1867. p. 251.


Although some persons consider the Siberian lily, a hybrid plant brought from the northern regions of Asia, it is more correctly regarded as a species of Lilium. The flower is sepaloid, the petals are longer than the sepals, the pistil is longer than the stamens, and the ovary is superior. The flower is typically liliaceous, the petals are usually 6, the stamens 6, and the ovary is superior. The fruit is a capsule, containing numerous seeds. The plant is hardy and can be grown in most gardens. It is a beautiful addition to the flower garden and is often used in cultivation. The foliage is evergreen and the plant is hardy in most regions. It is a beautiful addition to the flower garden and is often used in cultivation.
In a long and philosophical discussion on the influence of foreign pollen on fruit, copied from the Journal of the Botanical Society, the papers of Pr. Maximowicz describe very clearly the peculiar formation of the buds of this species. He then describes his experiments in fertilizing L. daruricun with its own pollen and cross-fertilizing it with L. bulbiferum, and tells us that the effect of this cross was to produce on L. daruricun a capsule closely resembling that of L. bulbiferum; whilst L. bulbiferum fertilized with the pollen of L. daruricun produced the capsule of the male parent.

Now the fact, if it could be really verified, would be so remarkable, as to be contrary to the experience of many persons who have attempted to hybridize lilies (see under L. Parlament), that I cannot help supposing that there must be some error in the statement.

From what I have seen myself, I believe that very much dependence cannot be placed on the form or size of the lily-capsule produced in cultivation. It often happens that complete fertilization does not take place and even often that the size or the shape of the capsule is not sufficient to enable it to mature or even swell the whole of the capsule, in which case the shape is very different from what it should be. Whether the difference between the capsules of these plants in a wild state is really apparent I am unable to decide, from the absence of native specimens, or I have never seen or been able to examine a perfect capsule of L. bulbiferum, and the only specimen one existing in the Kew Herbarium, being from Corsica, the apex of which was cut and examined for me by Mr. Cramer. This particular plant I have never seen, either as a specimen or having the particular papers on hand.

I was at one time inclined to believe that the plant shown in fig. 3, which is undoubtedly L. bulbiferum, was different from the one described by Mr. Cramer, as the articulation of the bulb-seal is different (see figs. 3 and 4), which both he and Pr. Maximowicz regard as one of the distinctive characters in their Siberian plant, as far as my experience goes, and I am able to view the old cultivated strain, which has, moreover, a creeping habit (see fig. 2). Long cultivation may have had the effect of making this difference, though it does not seem to have improved the size or the swelling of the bulb, which is always fragile and delicate, but there is no difference whatever in the forms or flowers of the two varieties.

Gawurin writes of it in 1829, "If has now been cultivated in our gardens for at least sixty years, during which time it has maintained its apparence and habits. It is very slow of flowering, never produces more than two flowers, and rarely more than one; hardly ever a perfect plant, but a profusion of offsets, which never arrive at a greater size than that of a small bulb, the stem is always lax and delicate, having in it the appearance of having been drawn up in a bud." The Siberian Lily extends from the mountains of Russia, and is found by Mr. Maximowicz and others.

I am indebted to Mr. Bruck for the plant shown in fig. 1, which was received by him from St. Petersburg.
LILIUM CROCEUM.
THE ORANGE LILY.


L. Croceum, P. T. Megard, 415.


L. Croceum, P. T. Megard, 415.

L. Croceum, P. T. Megard, 415. Lilium, in its native home, is usually a tall plant, reaching a height of 1 to 2 meters. However, in cultivation, it is often grown as a dwarf, reaching only about 1 meter in height. Its flowers are orange-red and its leaves are long and narrow. The plant is hardy and can be grown in most garden conditions. It is a popular garden flower in many countries around the world.
In my country it is well known that I need a little of it. There are many so-called varieties in cultivation, of which some are possibly hybrids and others several varieties; the origin of most of them is lost in obscurity. The one called 'Fei de Paris' is one of the earliest and showiest, often bearing as many as 40 flowers on a single stem.

L. 'Fei de Paris' of Mrs. Blum's garden is a miniature form with much smaller flowers, and only about 2 feet high; whilst the common one often attains 5 or 6 feet in good soil. The capsule of this species is easily distinguished from that of L. elegans by its angular apex, and is said to be different from that of L. bulbiferum; but I have seen so much variation in the shape and size of capsules on plants of the same species, that I do not think any great importance can be attached to slight variations.
LILIUM CARNIOLICUM.

THE CARNIOLIAN LILY.


**Habitat**: Peruvian Andes, occasionally from Huascarán to Mancos, Peru. Peru to Bolivia, occasionally from Huascarán to Mancos, Peru.

**Characteristics**:
- Flowers white, with greenish margins and yellow or greenish-violet spots on the petals.
- Petals 6-8 cm long, often recurved at the tips.
- Sepals 5-6 cm long, usually wider than the petals.
- Stamens and style slender and extending beyond the petals.
- Fruits an achene, often yellowish-green.

**Description**:

The Carniolian Lily is a species of lily native to the Andes of Peru and Bolivia. It is named for its distinctive recurved petals and slender stamens, which extend beyond the petals. The flowers are white with greenish margins and yellow spots on the petals, making them easily identifiable in the field.

**Habitat**:

The Carniolian Lily is found in the high-altitude regions of the Andes, specifically in the areas around Huascarán and Mancos, Peru, and extending into Bolivia. It typically grows in areas with well-drained soils and cool, moist conditions.

**Flowering Season**:

Flowering occurs during the late spring to early summer months, depending on the altitude and location.

**Uses**:

This lily is a valuable addition to any alpine or high-altitude garden, providing a unique and ornamental touch with its recurved petals and slender stamens. It is also a favorite among collectors and enthusiasts of rare plants.

**Conservation Status**:

The Carniolian Lily is assessed as 'Vulnerable' due to the limited distribution and fragmented populations. Conservation efforts are necessary to protect this species from habitat loss and other threats.

**Scientific Name**:

LILium candidum.

THE WHITE LILY.


A bulbous herbaceous perennial albulous plant, belonging to the genus Lilium. It is a native of southern Europe, Asia Minor, and the East Indies. It is a member of the genus Lilium, which includes a number of species, all of which are characterized by their showy flowers and long, slender leaves. The species L. candidum, also known as the White Lily, is one of the most popular and widely cultivated species in the genus. It is known for its large, white flowers, which are typically fragrant and blooming in the summer months. The leaves of the plant are long, slender, and pointed, and the flowers are arranged in large clusters at the top of the stems. This plant is commonly used in gardens and as a cut flower due to its beauty and scent. It is a hardy plant that can thrive in a variety of soils and is relatively easy to grow. It is a popular choice for gardeners and florists alike, and its white flowers are often associated with purity and innocence.
by M. de Cambert d'Hammar; a distinct species, and is said by Poirot D. Boss to have the style triangular near the apex; but after examining living plants, I think that Mr. Hance is quite right in placing it under the head of Astrolepis. There is also a double form in cultivation, which preserves none of the beauty of the single one, and is, like the striped form, a curiosity of no merit.

The white Lily seldom or never reappears in this country; and though it is said that by taking it up when in flower, and suspending it head downwards, it may be induced to do so, I have tried this method without success. Professor O. Depradt informs me that he has obtained seed by artificial fertilization, and has raised young plants from it. The notes on the propagation and development of this and other species, however, will be better understood, and more convenient for reference, if given separately at the end of the work; and this I hope to do in a more complete manner than would be at present possible.

The history of the white Lily must be sought for either in such ancient authors as Celsus, Paternus, and Pliny, or in a work like the present, as it has been known in gardens from the earliest ages. In a charming little work on the History of Flowers, by my friend M. de Cambert d'Hammar, President of the United Botanical Societies of Belgium, will be found a long account of its history, illustrated by many quotations from ancient and modern authors.

It was undoubtedly known by the ancients, and probably furnished the emblem of the Muses, by being on the standard of Phoenicia for so many years, though some think that the design of the flower was taken from the white Flag (Leucotis pavonina).

It is said to be found wild in the Alpes mountains, in the Pyrenees, in Corsica, Italy, and many other parts of the southern part of Europe; but having been so generally cultivated for centuries, it is doubtful in which, if any, of these localities it is truly indigenous.

Mr. Baker, however, gives its range as from Crete, through Greece and Turkey, to Palestine, Nubia, and the Caucasus; and though I have never seen it wild in Turkey or Asia Minor, it is mentioned in the Flora of almost every country of Southern Europe. Linnæus, in the "Flora Rossica," speaks of it as indigenous in Georgia, which seems more likely to be its native country than any part of Europe.

*Monographie des Liliacees, p. 100*
LILium Tenuifolium.

THE NARROW-LEAVED LILY.


Both usually small and slender, but sometimes much larger. In the stock usually 1, but in some cases from 4 to 6. The flowers are single, white, and very fragrant. The leaves are long and slender, and the flowers are slender and graceful, the whole plant being of a graceful and elegant character.

THE Narrow-leaved Siberian Lily is the smallest and most slender of all the species in this genus. It has been known to flower for a century, but has never become common and, as it is not handled or sold in Europe, it is not known to be cultivated in any but the most open gardens.

In its wild state in Siberia, the Narrow-leaved Lily does not usually flower more than once or twice, though in Montenegro it sometimes flowers as many as fifteen times, and in some parts of the world it is known to flower as many as twenty times in one stem. The flowers are very rare and, as the leaves are small, it must be concluded that, as grown by good people, it is by no means so fine a plant as depicted in my Plate. It is drawn from a splendid specimen grown by Mrs. Wiseman, of Wybriack, which flowered in the end of May 1875.

To attain such results as this, strong bulbs, which have been grown from seed, must be procured.

* Mrs. Wiseman sent me the leaves of the same plant, and this is not the case in any of the living species I have examined.
and though it is not generally known or practised in England, the process is a very simple one. Fresh seed of *L. japonicum* will germinate very easily and quickly, and, if properly treated, produces flowering bulbs in three years.

At the famous nursery of Mr. Louis van Houtte, at Ghent, I have seen a bed containing thousands of this Lily, all raised from seeds, which surpassed in health and vigour any of the same species I have noticed elsewhere.

It appears to grow best in a light and sandy soil, though most soil will suit, but is very apt to die after flowering strongly. I am, indeed, inclined to think that the bulbs of this Lily are not truly perennial, and perish from the mere act of reproduction by seed, like those of *L. plicatum*. This, however, may not be their habit in nature, or even in all parts of England. The Lily called *pumilum* by Van Swane, which was introduced by him from Japan, is, in Mr. Keissel's opinion, merely a cultivated form of *tenuifolium*. It does not appear to be common in Japan, if, indeed, it is indigenous, as I have seen no specimen in any herbarium.

The bulbs of this Lily which are imported from Russia have a somewhat different appearance from the one shown in the Plate, the scales being longer, thicker, and less numerous; they are sometimes obviously bent; but these details will be best shown by woodcuts at the end of my work.
LILIUM CHALCEDONICUM.

THE SCARLET MARTAGON LILY.


2. Subgenus martagon, Boedde, Fig. 78.


Roots fibrous, slender; rhizomes short, thick, subterranean. Flower buds small, violet purple; flowers small, violet, tinged with scarlet. Anthers yellow, filaments white; stamens eight, filaments white, anthers purple; ovary purple, style purple, stigma white.

Fructus globosus, violet-purple, viscid, containing several seeds. Seed purple, winged, ovate, six-angled, scaly, with a short stalk.

The Scarlet Martagon Lily is found wild in many parts of Greece, and in Italy, up to a considerable elevation on the mountains, or on Mount Parnassus at 2000-2200 feet elevation, and at elevation on Mount Medon, at 2000 feet, but I have no certain proof of its occurrence in Turkey or Asia Minor. Brought from the Levant in the 16th century, at the same time as many other bulbous plants, it was well known to Herow, Parthenius, and the other old writers on plants.

Now, however, owing to the complete cultivation in the arrangement of our flower gardens, which has driven so many old favourite out of doors, the Scarlet Martagon, though one of the most brilliant and easily cultivated of plants, is more often seen in a cottage door than in the gardens of the rich, and in Glanville's time it is a very common and well-known plant.

It is a very healthy, hardy, and a light soil, and will thrive in unincultivated corners where few plants can thrive. Deep shade, however, is not very congenial to it, and it is more strongly affected by transplanted than most other lilies, so that it does not attain its full size or number of flowers for two years after it has been moved.

There is, as far as I know, no remarkable variety of this species, and in cultivation, though several supposed varieties are mentioned in catalogues, what is called Chalcedonicus does not appear to be more than a luxuriant state of the common sort, and the wild plants which I have seen imported from Greece, though smaller and fewer-flowered, are very similar to those which have been perhaps for centuries in cultivation. It has never been crossed or intercrossed, or of any name, and judging from my observation of other double forms, it would be far inferior to the single flowers. L. chalcedonicus rarely produces seed under cultivation; but as it is easily increased by offsets and the seedlings grow very slowly, this method of propagation is not often followed.

The species referred to by Mr. Buxton in the 'Linnaean Journal' as L. adenium of Grisebach is really L. erythrinum, and L. carthusianum, from Martagonia, the type of which I have examined, is a species of Punslium.
LILIUM BROWNII.

BROWN'S LILY.


Both the flowers and the seed-pods are very large. The flowers are large, the petals are very large, the sepals are much shorter, the stamens are numerous, the style is short, the ovary is large. The fruit is a large, many-seeded capsule, which is divided into many segments, each containing a single seed. The seed is large, the endosperm is large, the embryo is large.

This fine plant was introduced to Europe from China, as long ago as 1804, by Capt. Blackmore of the East India Company's service, and has been sparingly cultivated in England ever since it has been noticed several times under the name of japonicum, but as that name has been applied to a very different plant and is also common as regards the native country of the plant, it must be the name of Brownii, by which it is already very well known in gardens, and which was first applied to it in 1844 by Murrill, after a nurseryman of Strach, in whose "Catalogue" it was brought to notice about 1833.

As a cultivated plant, L. Brownii is known in parts of China and Japan, but its native country had no certainty until recently. There are specimens in the Kew Herbarium, collected by Mr. Thwaites on Herschel Island, one of the Bermudas, which I think may safely be referred to this species, and I was pleased to discover among the plants collected by the Amur Devils in the mountains of Kiangsi, in Central China, specimens which differ in no important point from L. Brownii, though the colour of the pulmon appears to have been yellow rather than red.

I have seen no specimen of this plant worth notice, and cannot allow that what is described in the "Flora des Sudischen" recently as L. japonicum "Deltendorfii" is distinct from L. Brownii. Probably the slight difference which may be found in it may be attributed to the fact that it has been recently imported from a Japanese garden, whereas the other strains of Brownii is from China and has been cultivated in Europe for seventy years.

Such slight variations may be discovered in plants grown under very different conditions, as may be known to them being treated as different plants, however desirable such a course may seem to those whose only object is to satisfy their catalogues and bring out old plants under new names.

L. Brownii is one of the best plants we have in places where it is sterile, but in a rather particular as to the quality of the soil, and has never become at all common in England.
From what I have seen of its cultivation on the continent, where it is largely grown by some of the Dutch and Belgian nurserymen, and at Berlin, where it is esteemed by thousands, I imagine that a very light soil is necessary to its well-being. In the late M. Van Houtte's nursery at Ghent there was a bed of it in great perfection, many of the plants having two or three flowers on a stem, though the soil is little better than sand enriched with manure. In Messrs. Osborn's nursery at Welton I have been told it used to thrive; but, though perfectly hardy, one rarely sees it doing well in private gardens.

I have never been able to procure a perfect capsule; but I am informed by Rev. Mr. Leake that the seed germinates quickly, so in all the Asiatic group, and would probably flower in the fourth or fifth year of growth.

The purple colour on the outside of the flowers of L. nasturtium varies in depth according to the amount of light the plant has received, and is not so dark when growing in a shady place. My figure was taken from a plant grown by Capt. Thorne Clarke, of Welton Place, which flowered early in July 1873.
LILIUM MONADELPHUM.

THE CAUCASIAN LILY.

* L. monadelphum, M. Roth. in在游戏中, 1787; Eng. Bot. Mag. t. 41; Gard. Dict. Bot. ed. 6, 1858; Sowerby, Enum. 1809; Regel, Charono.: p. 211.


He is a monadelphic, solitary, basally stalked, labellum. It is a large bulb, the outer perianth-segment being the largest, white, and often tinged with a pinkish hue. The inner segments are smaller, and are usually pale yellow, but sometimes tinged with a greenish tinge. The lip is large, ovate, and fleshy, with a large, central, yellow, nectar-spur. The flower is large, showy, and fragrant, blooming in early summer. The fruit is a large, oblong capsule, containing numerous seeds. It is a handsome plant, suitable for rock-gardens or borders.

BIOGRAPHY:

L. monadelphum is a very showy and fragrant plant, suitable for rock-gardens or borders. It blooms in early summer, and is often used in rock-gardens. The flower is large, showy, and fragrant, with a large, central, yellow, nectar-spur. The fruit is a large, oblong capsule, containing numerous seeds. It is a handsome plant, suitable for rock-gardens or borders.
Though introduced by Mason, Lovarias early in this century, it has not become common until the last few years, when it has been imported from its native country in large quantities. Being a very variable species, it has been described and figured under several different names by various authors; and though the varieties are fairly distinct, yet they run into each other so closely, that I think best to follow the high authority of Mr. Buxton in considering them as varieties only.

The plant was first described by the Russian botanist, Lavarios, as L. pyrenaicum; and though that opinion may seem ridiculous when we first read well-proven plants as common, yet one of the varieties, which Mr. Buxton has distinguished as the Leucojum, is but little different from the Pyrenneum plant.

The monadelphia character of the stamens does not appear to me to be a constant or reliable character. It varies very much in different plants—some having the filaments united for at least one-third of their length, and others only at the base 60 (as is more common in the variety called Scovisianum) not at all.

The plant described as L. pyrenaicum by Pears, Cast, Koch, of which I have seen the type specimen in the Berlin Herbarium, does not appear to me to be in any way separable from this species. The living plants cultivated in the Berlin Botanic Gardens certainly are not so; and I am confirmed in this belief by the opinion of Pears, Cast, Koch himself. There is, however, in Lazistan (the mountainous region at the S.E. angle of the Black Sea) a much smaller and possibly distinct plant, collected by Balan, and distributed in herbaria by Mr. Dossen as L. ponticum.

As far as I can learn, the variety monadelphia (which is here figured from a plant which flowered in my garden in June 1876, and produced twenty-two flowers on one stem) is confined to the northern and eastern parts of the Caucasus region; while the variety Scovisianum (of which a plate will be given shortly) is only found on the southern slopes of the mountains in the provinces Imeretia, Mingrelia, and Georgia.

I would here point out that, though I am not at all certain that these two forms can in all cases be well separated, yet, as a rule, they may be distinguished by several characters, among which the colour of the pollen, which is red-brown in monadelphia and brown-yellow in monadelphia, is the most conspicuous. Monadelphia is also from a fortnight to three weeks earlier in flower, and, when first showing above ground, usually has its flower-buds expanded, whereas in Scovisianum they are concealed by the leaves until the plant is just ready to bloom.
LILIJUM JAPONICUM.

KRAMER'S LILY.

3. Eichler, Hist. Icub.


L. Elizabethe, Hort. Lid. dalis, gracilis, tores, glaber. Folin distantia, sparsa, lineari-lanceolata, Balbus perennis, parvas, pyriformis. Caulis 1-3 petiolata, бева, viridia, 9-3-nerrata, 3-6 poll. longa, 0-0 lin, lata. Perianthium suaveolens, horizontale, vel roseum, 4-7 poll. longum, e basi ad collum sensim ampliatum; segmentis late таба oblongis, tertiis superiore falcatis supra medium, exterioribus 10-15, interioribus 10-15 poll. longis. Filamenta et antheris rubris, ovario 1 poll. longo, stylis brevioribus, capitata. Ovarium 1 poll. longum, sub dupliciter brevius, capsule acute angulatis, 1 poll. longa.

Bulb small, about 1-2 inches thick, pyriform, whitish. Stem 1-3 feet high, erect, glabrous. Leaves scattered, linear-lanceolate, 10 lines broad, Flowers 1-3, white or rose-color, up to 1 foot long. Pedicel 1-5, white or rose-colored, sessile. Perianthium 1-2 inches long, stipuliferous like that of L. maximowiczii. Flowers with the authors shorter than the perianth; stamens large with red pollen. Ovary 1 inch long; style slightly declined, ovary bluntly angled, about an inch and a half long.

The charming Lily here described has a curious history, and affords an additional proof of the necessity of studying such plants from living rather than from dried specimens. When introduced to Europe a few years ago, it was considered a new species, and figured as such in the Botanical Magazine. Provenchon Maximowicz, on seeing the plant in flower at Mr. Wilson's in 1875, told me that it was known to him in Japan, and had been regarded as L. japonicum of Thunberg. To make this certain, Mr. Baxen was good enough to procure, through the kindness of Prof. Ahneson, of Upsala, the specimens of Lilies collected by Tuvxnenc in Japan, after examining which we both agreed that the original plant named japonicum by him was identical with what had hitherto been known as Krameri and not, as was supposed, with L. brunii.

I have little doubt that the Lily described as L. belladonna, from a drawing made by Mr. Haxsox of New York, and kindly sent me by him, must also be referred to this species: for though I have not seen the plant from which the drawing was made, I have seen forms of L. japonicum very closely resembling it. Both L. Krameri and L. belladonna have been supposed to be hybrids; but from what I can learn about the plant in its native country, I think there is little chance that it is a distinct species, occurring abundantly in some parts of Southern Japan.

Provenchon Maximowicz did not see it himself in a wild state, but had it brought him from a considerable elevation in the mountains of Senana, in the island of Nippon; and Mr. T. Hoco, an American gentleman who has sent home large quantities of bulbs of this plant, says that it grows wild near Lake Biwa, on the hills of Kii, in South-West Japan.

Until 1876 it was, owing to the difficulty of importing its small and rather delicate bulbs alive, one of the rarest in our gardens, but large importations having been received in first-rate condition during the last two seasons, it has been sold at a more moderate price than formerly, and has become better known. If healthy bulbs can be procured, there seems to be no particular difficulty about growing them, though I must confess that no one has, to my knowledge, rivalled Mr. Wilson in his successful treatment of this Lily.

In his hands it attains a height of 3 feet, or even more, and produces one to four or five flowers of a great size and beauty; but more commonly, in my own garden, it assumes much smaller proportions, as in
the variety distinguished by Mr. Baxex as Barrianum. If cultivated under glass, it should be treated exactly like G. auratum; but it may be grown and flowered out of doors with success. Its propagation at present is little understood, as offsets are not produced freely, and the seeds, if obtained, seem to lie a year in the ground before germinating.

At the Vienna Exhibition in 1874 a large collection of Lilies was sent by the Japanese Government, from the Royal Gardens at Kiuso, accompanied by excellent drawings from nature. Among them were several forms of G. japonicum, varying considerably in size, form, and colour. One of the most beautiful of these (which I saw flowering in Hsiau Losenvati's garden in 1876, under the name of G. Elisabetha) was a large pink-flowered form resembling the one which I have figured, and it is possible that some are hybrids between G. japonicum and G. auratum, which is nearly allied to it.

The plants here figured are the rose-coloured and the white variety, and were both drawn at Mr. Wrixon's residence in June 1876. The outline of a petal of a singularly laminated form is also given, though this malformation is probably not permanent. In the 'Gardener's Chronicle' for August 14, 1877, Mr. J. H. Knecht, of Harrow, mentions a fine purple-flowered variety in his garden, which I have not as yet seen elsewhere.
LILIUM MARTAGON.

THE MARTAGON LILY.

The Martagon Lily is so well known to every one that it is hardly necessary to describe it. It has been so long in cultivation, that we have no record of how and when it was introduced. It may perhaps be indigenous to this country, though more probably, where found in an apparently wild state, it has escaped from cultivation. It is found all over Western, Central, and Eastern Europe to Siberia, as far north as lat. 61, and in the Caucasus and Oural Mountains, growing in rocky districts in meadows or on the borders of woods, among grass, up to an elevation of 6000 or 6000 feet.

The varieties of L. Martagon are numerous; but, as far as I know, only two are found in a wild state, namely—L. Martagon Mill. Descrip. Bot. Mag. pl. 982, and L. Milleri Schultes, which is figured in the Bot. Mag. pl. 1634. This is the one most commonly seen in gardens, and is the kind generally found in France, Germany, and other countries.

The White Martagon, of which I have given a representation on the Plate, is another very pretty variety, and very scarce, where it is probably originated. There are also many others, varying more or less in colour, size, and flowering, which are occasionally seen at the present time, but are much better known two centuries ago (vide Parkinson’s Paradisiac, 31, where a list of them is given).

The very distinct variety of this plant usually called ebullosum, though it had been previously described under the name of Oedipus, was hardly known to collectors until 1876, when it was introduced in quantity through the agency of Mr. Max Lenz, who undertook a journey to Bulgaria on purpose to find it.
He informs us that, having received information of the existence of a plant in which it grew, he started in September 1871, and, after a journey of seven days' by steamer from Marseilles, landed at Constitution. From here he went into a very wild country to the frontier of Turkey, and after much searching among the rocks, discovered the plant he was in search of. He says: "The plant begins to creep at about 3000 feet elevation, and are most numerous in the Goynukh, the rocky bed of an ancient stream. Here the rocky ground is cut up at intervals by crevices some 30 to 50 feet broad and 100 deep, in the bottom of which lava and snow were lying. Wherever on the sides of these crevices a little earth is found, the plants grow, having their roots close to the rock in a moist soil."

The colour of this plant is an extremely bright, though dark, purple, not easy to describe or illustrate, and is a little deeper than that of the variety called Celerina, which is found more to the northward in the mountain-forests of Velitchik.

Nothing can be simpler than the cultivation of the Martagon Lily. If planted in good soil of a stitch character, and understood, it will always be an ornament to the garden. I have a clump near in London, on which there are at least three hundred flowers and no other, some of the clones bearing as many as forty to sixty. The seeds of E. Martagon germinate readily, but grow very slowly, and take seven or eight years to produce flowering bulbs.

I have figured the Rubaria variety of the Martagon in preference to the common sort, as, though just as easy to cultivate, it is so much more beautiful and less known. I have also given a representation of the white variety and of a pale pink one which I found in the garden of Mr. Thomas Clarke.
LILIUM SUPERBUM.

THE SWAMP LILY.


The Swamp Lily is found commonly in most of the Eastern States of North America, from Canada to Carolina, growing in wet and swampy ground which is sometimes under water all the winter. Mr. Halswell tells me that he once found a spot in New Jersey where there were at least 5000 plants of this noble Lily all in flower at once, ranging up to 6 feet high, and bearing as many as 30 flowers; but of the whole number it was difficult to find three exactly alike. The western range of this plant is not well known; and towards the Southern States it merges into a distinct form or species known as L. carolinianum. Asa Gray, of which I shall give a figure separately. According to Phipps, and others, the Swamp Lily also approaches L. canadense very closely in some of its forms, but, as far as I have seen, they may always be distinguished by the green triangular marks at the base of the inner perianth segiments, and generally by the purple colour of the stem.

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L. superbum, in suitable soil, attains a great height and beauty, but is rarely seen in perfection in England. It likes a deep, wet, peaty situation, and will hardly exist on dry or calcareous soils. It may be seen to great advantage in the nurseries of Mr. A. Wragge, at Knaphill, at Mr. P. Baskett grounds, and elsewhere.

It has been introduced into this country for at least a century, perhaps longer, and is now tolerably common. Its bulbs are imperishable, and should never be disturbed when the plant is in a thriving state. It produces seed freely; but this does not germinate for a year or more after sowing, and is very troublesome to raise. Though in size, number, and quality of flowers the plant is very variable, I have seen no varieties worth naming, what is known as L. superbum pyramidale being simply a luxuriant form of the plant when well established in deep moist soil.

My figure was taken from a plant which flowered at Mrs. Wilson's towards the end of July 1874, and though not showing the green star at the base of the flower in plain view as I should wish, is a very good representation of it.
LILIJUM LEICHTLINI.

LEICHTLIN'S LILY.


Habitat in Japan (Muak). Wakes in Japan. Leichtlin. 1867, 274, cum frunculis et forma liriosima humerosa.

Vern. Japonica (MAXIMOW.):—

This handsome Lily which bears the name of one who has perhaps done more for this genus in a horticultural sense than any other person comes from the borders of Japan, 1867, as first brought to notice by its accidental appearance amongst a bed of Lilium auratum in Messrs. Verrv's Nursery. Since that time it has been imported from Japan, and has been cultivated with indifferent success in Europe, though, as Mrs. Williams has shewn, there is no reason why the plant should not be grown and propagated with success even so many other species. The creeping habit which is characteristic of this Lily must always be taken into consideration, as, if planted in a small pot, the shoot is not to get broken or checked in its growth; and as it is never very robust, in many cases death ensues. If planted in the open ground, care must be taken that the soil is light and protected from the hot sun, as this Lily is easily scorched up and injured by drought in summer.

Very little is known of the plant in its native country; but I am indebted to Professor Maximowicz for the following information:—"I find this Lily first from the gardens of Yedo, in 1862, blossoming at the end of July and in August, under the name of L. Auratum, i.e. Lily from Yedo Island; but the native botanists call a plant which seems to be a variety of L. Auratum by the same name. In the middle of November I got it in ripe fruit from the woods at the foot of Fuji-yama. From here it is said to extend throughout the whole peninsula to the neighbourhood of Yokohama, but nowhere very common. It blooms 1-2 flowers, and differs from L. Maximowicz in the following particulars:—

L. Maximowicz.
The stem is robust; peduncles shorter than flower. Stems entirely at the base. Filaments broadly subulate.

Capsule carminata.
As Professor Maximowicz is perhaps the only botanist who has had the advantage of comparing these species in a wild state, great weight must be allowed to his opinion, but I cannot withhold the remark that, however different they may appear at first sight, I am not inclined, as far as my experience of them in cultivation goes, to allow much importance to these characters. In fact, if it were not that such good botanists as Dr. Hooker and Mr. Banks had treated this plant as a distinct species, I should be inclined to join it with L. pseudoagrimonia and L. Audraniana. The colour of the flower, however, will always distinguish it from either of these, and does not seem to vary at all.

The form distinguished as L. Leichtlini major is, I believe, in a great measure the result of the superior cultivation for which Mr. Wizzou is so distinguished, as I have not seen it except in his garden. I am indebted to him for the plant here figured, which flowered at Heatherbank in July 1875.
**LILILUM CALLOSUM.**

**SIEBOLD'S LILY.**


*L. pumilum,* Miq. Fl. Jap. 121, non Linn.

Flowers purpureo vel canescente, amplexicaulis; pedunculus capitatus, glaber, 1-3 dm. longus; bracteae externae lanceolatae, glabrescentes; floribus segmentis ovarii saepe angustioribus; capsula obscura, brunnea, 15-18 lin. longa, seminibus numerosis, angustissimis, recurvatis.

**Hab.** Japonia et insole Loochoo (Maximowicz, Occid. Bot. 283).

**V.**


* L. reflexum, Maxim. Fl. Amur. ex Hort. Laichr. non D.C.

* L. japonicum, Regel, Fl. Jap. 158, t. 465, fig. 1, et bert. Bezicin. non D.C.


**Hab.** Manchouria (Maximowicz), Manchuria montanissima (Maxim).

*Bulb* globose, an inch thick, with oblong campolate white scales. Stem 1-3 feet high, slender, terete, glabrescent, sheathing to purple at base. Leaves 20-30, scattered, lax, linear, 3-4 inches long, 1-2 lines broad, narrowed gradually to the base, acuminate, the edges slightly revolute, 3-4 veined. Flowers 2-3; perianth auriculate, ascending, 1-3 inches long, recurved (in the Japanese plants, though not so distinctly in the Siberian specimens) by a pair of bracts, calices at the tip. Pedicles slender, with obscure black dots an inch long. Filaments about an inch long, terminal. Ovary clavate, 1 inch long; style 4 inch long; anthers versatile, 8-4 lines long. Capsule 1-3 inch long, narrow in proportion to its length.

The plant here described is one which, until quite recently, was little known in Europe; and as it has been confused by authors with another species (*L. reflexiforme*), I have taken an early opportunity of figuring it.

Originally described and figured in Sower's fine folio work on the Flora of Japan, it was afterwards described by Maximowicz in Anziall. Bot. in St. Petersburg in 1871. The continental variety which he sent, being in some points unlike the Japanese plant figured by Sower, was supposed by Dr. Baker to be the *Lilium pumilum* of Maxim, and was figured by him under that name in the *Gartenlaube* for 1865.

This variety was afterwards described by Mr. Baker in the *Journal of the Linnean Society,* from a drawing of Mr. Learmonth's, as a variety of *L. reflexiforme.* On a subsequent examination of the plant in a living state, and comparison with dried specimens from Japan, however, Mr. Baker agreed with me that it is really not distinct from Sower's species, though the callous bracts, which in his figure are probably somewhat exaggerated, are barely visible in many specimens.

Professor Maximowicz of St. Petersburg, to whom I applied for information, confirms this opinion, and tells me that this variety, which in callous pumilum, is smaller and lower than the Japanese variety, has fewer flowers, broader leaves, and finer conspicuous bracts. He found it rare in Manchuria, in the low flats along the
Sungari river; but more common on drier meadows further up the same river, where it flowers in the month of July. The Japanese plant he found abundantly round Nagasaki, at 600-2000 feet elevation, in mountain-pastures, where it flowers from July to the end of September — also in grassy valleys at the foot of volcanic mountains in Shikoku, he did not find it, however, in the island of Japan.

Simono tells us that he found it growing, in company with such plants as Smilacina, Lepidiz, Veronica, and various grasses on the slopes of volcanic mountains. He also states that the bulbs are collected and eaten like those of L. tigrinum, either boiled or roasted. They are very nourishing and agreeable in taste, and are used in a preserved state as a remedy for chronic coughs.

As an ornamental plant this species has little to recommend it. Its flowers are small and dull in colour compared with most Lilies, and though it is quite hardy and easy of culture, it is not likely to find favour in the majority of gardens. The specimen figured flowered in my garden in July 1876, from a bulb sent me by Dr. Hook, in the previous autumn. It produces seed in good seasons; but, being now tolerably abundant in cultivation, I have not attempted to raise it. I believe that most of the plants now in England are of Russian origin, and belong to the Siberian variety, as I have seen some which showed the callose bracts as distinctly as they are shown in dried specimens from Japan.
LILIUM PARVUM.

THE SMALL-FLOWERED ROCKY-MOUNTAIN LILY.


Bulb breviter rhizomatus, apicula basis articulata, abaxia. Calyces 3-5-petali, longi, viridi, glabri, infra marginum inanis. Filii picti, vel stellati, 3-8 petali, longi, 6-8 mm. longi. Ovaria 3-4-stylata, longa, ovata, superciuscula, stigmata brevissima, 3-4-lata, longa, obtusa angulata. Capsula truncata 4-6 lin. longa, 3-4 lata, obtusa angulata.

Oea. California ad montes Sierra Nevada, altitudo Boraxius.

The name of parvum, though applicable to the flowers of this plant, which are small in comparison with those of its nearest allies, is certainly not descriptive of the species; for though not usually seen in Europe, it is said to attain in its native mountains a height of 5 feet, or even more. It has only been known to the scientific world since 1868, when Dr. Kellogg, of San Francisco, described it; and though not recognized as a distinct species by Mr. Baker, I think I can clearly show that, though not usually seen in Europe, it is said to attain in its native mountains a height of 5 feet, or even more.

It is a native of the higher parts of the Sierra Nevada, and other ranges in the Pacific States of North America, where it is found at an elevation of 4000-8000 feet. It is said by Dr. Kellogg to grow exclusively on the banks of mountain-streams, or in shady swampy places through which a constant stream of cold water runs.

It was first introduced by Mr. B. Kellogg, who sent it to Messrs. Learmonth in 1872, and was figured in the *Gardener's Chronicle* in 1873, though, owing to the weak condition of the plant, that plate does not give a good idea of its real character.

There are many varieties of colour, some without spots, and some much deeper than the plant figured; but I have never seen any departure from the characteristic form and position of the flower. Five of these varieties are named by Mr. J. H. Kellogg, in his *Catalogue of Lilies*, 1878.

The bulbs of this lily sometimes grow in large masses which produce a number of stems and many flowers in every direction; the scales are usually articulated in three or four places, and are very fragile. In this state it is best to leave it undisturbed as long as possible, until, either from the exhaustion of the soil or from the overcrowding of the stems, it becomes necessary to divide it.

It appears to succeed best in moist peaty soil, and if undisturbed soon requires division, though I have nowhere seen a finer example than the one here figured, for which I am indebted to Messrs. Learmonth and Scott, in whose garden it flowered in May, 1872.
LILIUM NEILGHERRIENSE.
THE NEILGHERRY LILY.

L. neilgherriense, hort. Veitch.; Lemire, Ill. Hort. x. t. 86.

Bulb oblong, 1-2 centimeters thick. petals ovate, cream-colored, hyaline. Outer petals 2-3 centimeters long, white, and much broader. Sepals 3-5 centimeters long, greenish-yellow, hyaline. Petals about half as long, greenish-yellow, hyaline. Sepals 1.5-2 centimeters long, greenish-yellow, hyaline. Petals 1.5-2 centimeters long, greenish-yellow, hyaline.

Habitat: Ad montes Indie peninsularis, 5000-8000 ped alt. (W. Wight).

Bulb roundish, composed of fims, thick, firm, white or purplish scales. Stem 1-2 feet high, with many bulbils at its base. Leaves 3-5 feet long, 8-12 inches broad. Flowers 1-3, or more, drooping in the bud, horizontal when expanded, white or lemon-yellow, occasionally purplish. Petals 6-12 inches long, with the tube narrow for nearly half its length, and the mouth widely expanded and slightly incurved. Sepals broad, obtuse, yellow. Peduncle 1-2 inches long, attached at the apex.

Two years ago I should hardly have ventured to publish the plate here given, lest I should be said to have exaggerated the size and beauty of this flower; but I am now confident that, so far from exceeding in these respects the limits of truth, I have, if anything, fallen short of them.

Lilium neilgherriense has larger flowers than any plant belonging to the Order Liliaceae with which I am acquainted, and, in dried specimens which I have examined, they exceed a foot in length, and, though not so attractive in colour as in some other kinds, are most elegant in form and deliciously scented.

The late Dr. Wight, whose great illustrated work on the plants of Southern India will always remain as a monument to his labours, first discovered this plant in the Neilgherry Hills, in which, with a few other mountain-tracts of similar aspect in Southern India, it is restricted. Though nearly allied to Wallich's Lily, which represents L. latifolium, and varying considerably in itself, the Neilgherry Lily may be looked upon as a distinct and fairly well-marked species—always to be recognized by its long-tubed open-mouthed flower, its creeping stem, and short leaves.

Though found in hilly parts of the Mysore territory, north of the Neilgherries, this Lily is not known with certainty to exist in the Arni-malai and Cudalamun Hills to the southward; but when travelling through these little-known regions in March 1870, I found what I believe were the withered stems of this plant; and, judging from the resemblance of the form of these mountains to that of the Neilgherries, I have little doubt it will be found in them wherever suitable localities exist.

Mr. M. Monax tells me that L. neilgherriense is generally found growing in rocky and precipiceous places, and also amongst low shrubs and on hill-sides. It flowers in the hilly country well suited for hill-sides. It flowers in the hilly country well suited for hill-sides.
It was first introduced into a living state in Europe, as far as I can learn, by Mrs. Lann, when travelling for Messrs. Veitch and Sons; but either because the bulbs which she sent were not in good order, or from some other cause, the plant was never distributed, and, though exhibited at a meeting of the Royal Horticultural Society on July 24, 1836, and figured by Darwin in the tenth volume of the 'Illustrations of Horticulture,' in 1837, it was soon afterwards lost sight of.

In 1844, through the kind assistance of Mrs. R. Moss, I obtained bulbs which flowered strongly in 1845; and large importations have since been made by Messrs. Bosanquet and Stevens, Nott, and others, so that the plant, which proves to have a much better constitution and to be more easy to cultivate than many of its companions, is not likely again to die out.

Though it may possibly grow and flower out of doors in the south-west of England, and even elsewhere, I should not recommend any one to treat it as a hardy plant—not only on account of its dislike to cold, but still more because of the very late period at which it commences growth.

Except L. lilacinum, I know of no other Lily which is so late, both in coming up and in dying down; and it has another peculiarity which must be well remembered by those who wish to succeed in its culture—namely, the tenacity which is shown by the young shoot to run for some distance in a horizontal direction before coming to the surface. This habit, though not invariable, is usual and causes the loss or injury of many bulbs when grown in pots. If care is not taken to watch the first appearance of the shoot and direct it upwards, lifting up with earth at the requisite level after it is well above ground, otherwise the shoot will funnel against the side of the pot, and, after taking a turn round at the bottom and working its strength among the crocks, come up through a whitish halo, or perhaps appear at last on the surface too late to be formidable to flower.

If once the shoot be allowed to grow outward it, and to keep down aphides, I believe this Lily will succeed to perfection, planted out in a Camellia-house, where it will have plenty of space to travel about at will.

Though I have not yet seen more than three flowers on a single stem, I believe it is capable of producing far more; and to nothing in order than to have plants flowering in succession from July to November, it must be considered equal, if not superior to L. candidum as an indoor Lily, and surpassing all others, except L. speciosum, which I still look on as the best of the genus.

Though the flowers vary in size from 6 inches up to a foot long, and in colour from creamy white to lemon-yellow and occasionally pink, the variety are, in a botanical point of view, very remarkable, and until I know more about their consistency and hard distribution, I should be disinclined to separate any of them from the type, though Warming, relying on characters which in this genus are of little value, described them as three species.

The seeds, which seem to take much longer in ripening than is the case with Lilies from higher latitudes, germinate quickly, like those of L. longiflorum, and produce leaflets at once, after the manner of L. candidum. I imagine that in four or five years the seedlings will attain a flowering size, but no bulbs are made freely, both on the bulb and on the subterranean stem; it is easy to increase the plant without so great an expenditure of patience.

The plant here figured flowered in the garden of J. H. Brown, Esq., at Colsham Manor, Gloucestershire, in July 1876, and is the same from which a drawing was made by Mr. Forrester for the 'Gardener's Chronicle.'
LILIUM PARDALINUM.

THE CALIFORNIAN LILY.


L. pardalinum, var. californicum, herb. Lindley; Florist, 1883, p. 124.


Bellus magnum, herbarium schizococcus, quassia monodactilum plantam omnem arboris, Cottle 2-6-pedunculata, terra, varietatis, glaber. Pollis in maximaex 1-12-stamina deposita vel purpurea, 2-6 poll longa, 1-3 lin. lat., glabrum, tetramere, 3-latis. Stamina 2-3, in maxima exsere, pedicello elongato et arborescente spinosum. Perigoneum 2-6 poll. longum, glabrum, rubrum, fimbriae, auriculae, purpurei, carinatae, segmenta lanceolatae, basi campanulatae, basi carinatae. Stamina percorso oblongo, teres, viride, Foliola in verticillo de 6-12 foliis disposita el sparsa, 3-6 poll, longa, 9-18 lin. lata, glabra, tenera, bidentata, sicli elongatis opio cern longum, splendide rubrum, fando aur.

Habit. California, Oregon, Utah. (Havemeyer; Baker, Kellogg, 86.)

Balls large, white, producing 1-6 stolons or new bulbs annually; composed of thick, white, often articulated scales. Stem 3-6 feet high, rough, glabrous, green. Leaves 4-7 inches long, 1-2 broad, glabrous, generally in regular whorls of 6-12 or more, but on young plants often scattered, rising from 1 to 5, more or less indistinct. Flowers 2-3, arranged in long pedicels in an open raceme. Perigoneum 2-3-inches long, not or scarcely, with the base part of the segments larger, pointed with purplish, most distinct. Stamina a third shorter than the segments, style carried, twice as long as the ovary. Capsule globular, spinous ambiguus.

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The three Lily, of which one variety is here figured, has been known for some years, having been collected by Havemeyer in 1848, and received the name of californicum from Dr. Lindley. As, however, no description was published until 1869, and a plant which had been previously named by Torrey cannot certainly be referred to this species, it will be best to keep it under Dr. Kellogg's name, by which it is most generally known, both in America and England.

The varieties of this species are both numerous and puzzling; but after watching the growth of many plants from different sources, in my own garden and those of others, for four seasons, I am inclined to believe that not more than two or three are worthy of description, and that even these might so change their form, if removed to a different soil and climate, that it would be hard to recognize or distinguish them. Botanists, when naming species from dried specimens, or after the comparison of a few plants, are often misled by characters which seem at the time and distinct, but which prove too unstable to rely on; so that the confusion which prevailed among the various western species of American Lilies would hardly have been cleared up if it had not been for the assistance that has been derived from horticulture.

I cannot certainly say whether the plants named Bourges, Bourges, and Walker come properly under this species or not; but all living plant out of the thousands I have examined can be referred to either L. canadense or L. superum; and though these species, or varieties of them, may extend west of the Rocky Mountains, yet I am inclined to think that all the Lilies with stoloniferous bulbs from the Pacific States are forms of L. pardalinum.

As I shall have to give another Plate of this species, I will leave the description of the different varieties for a future article, merely stating that the one figured here, which, I believe, should stand as var. californicum, may always be distinguished from the rest by the greater size and beauty, though smaller number, of its flowers, which rarely exceed three in number. I was informed by Henn Rosso that it is found on the coast range, at a lower elevation than the other varieties, and that in the interior it is represented by a taller and many-flowered plant which is called L. puberulum.
LILIUM CAROLINIANUM.

THE SOUTHERN SWAMP-LILY.


4. L. carolinianum, Michaux, Mem. Am. 47.

Bole: A Carolinian lily. (Karnes, Turrill, Nettled., Phen, Phen.)

Published July 12, 1885.

This species is a Swallow-plant, with large, white flowers, and a very showy appearance. It is found from Maine to Florida, and westward to the Rocky Mountains. It is a beautiful lily, and is a favorite with gardeners.

L. carolinianum is a native of the southern United States, and is found in the states of North Carolina, South Carolina, and Georgia. It is a showy plant, with large, white flowers, and a very showy appearance. It is a beautiful lily, and is a favorite with gardeners.

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LILIUM CATESBÆL.

CATESBY'S LILY.


[More text not visible in the image]

CATESBY'S LILY.

I HAVE figured this very distinct plant on the same Plate as L. candicans, because it is a native of the same parts of the United States, and these two species, as I believe, are the only Lilies found there.

Though it is not uncommon plant in many of the low sandy meadows, swamps, and pinewoods of the southern states, from Carolina to Louisiana and Mississippi, it is little known in Europe, being of a very delicate constitution and unable to endure the cold of our climate. It has been frequently introduced and figured in various publications, but we often lose it; as though it possesses considerable beauty, and is most distinct in appearance from any other Lily, it was, until recently, not yet to be found in any collection. What has been grown as L. Catesbaei in the Dutch and Belgian nurseries is, as I have before stated, a variety of L. candidum, and has not the least resemblance to the true plant.

The structure of the bulb is very different from that of any other Lily, though it somewhat resembles that of L. candidum, as figured in the "Botanical Magazine," 1791. It is composed of thin, brown, woody scales, terminating in broad leaves, which, as far as I can judge from cultivated plants, are produced in autumn, and grow through the whole winter.

As the leaves grow, leaving on their thickened base a distinct scar, others are pushed up from the centre of the bulb, until the plant is strong enough to flower. The stem that arises about the middle of the bulb, which, when the seed is ripe, produces, having only an effect and title, in its turn, grows into a flowering stalk.

It can thus be hardly termed a true perennial, being, like L. candidum, L. candidum, and some others, merely var. var. or var. after setting. The season of flowering is in August, in different parts of the country.

As to its culture I can say little: the plants that I have grown, though living for two or three years, make very little root, and, though I am afraid, die without flowering. I much doubt whether it will be possible to grow it successfully in this country, although the flower is of considerable beauty, and is often placed in vases, and similar in size, than represented in my Plate, which was made up from dried plants in the New York Botanic Garden, and from a small, weak, specimen in flower sent to me by Mr. Wm. M. Way, which, however, is the only flowering plant I have yet seen.
LILIUM LONGIFLORUM.

THE LONG-FLOWERED LILY.


Lilies provide various squares, including the Long-flowered Lily. It is 20-60 years and produces small bulbils. Its flowers are white, pure white, and tubular in length, opening at the mouth but not reflexed. Filaments are white, and the capsule is 1-2 inches long, usually glabrous. The flower is solitary, but often 2-0 or 7, pure white, very sweet.

The Long-flowered White Lily is a native of many parts of China, being found in Japan, Formosa, and Cochinchina, though perhaps not everywhere indigenous. It is also found on the island of Formosa; but this plant, of which I have not succeeded in getting living specimens, may be a distinct species, approaching in its very narrow leaves and the length of its flowers the Philippine Lily.

L. Longiflorum is much cultivated in China, Japan, and India, and seems to enable a greater degree of heat than any other species, but is at the same time perfectly hardy in this country. Introduced as long ago as 1819 by the Royal Horticultural Society, it soon became common in Europe, and may now be had by the thousand at a very low price.

No lily can be more strongly recommended for greenhouse decoration than this; for, though in some parts of England it may be grown well out of doors, it is apt to be injured by spring frosts, and rarely comes to perfection unless grown under glass.

The plant I have represented is the variety named Jepson, and is as much rarer than the ordinary L. longiflorum as it is superior to it. Though rarely seen in this state of perfection, I have had it even from, with no less than twenty flowers on three stems in a single pot.

For this fine variety I have to thank Mr. R. Jepson of Cheltenham, who received it from Japan some years ago, and has cultivated it with extraordinary success, as will be admitted by any one who has seen the Cheltenham flower-shows, seen her specimens, and has been able to verify her observations in this respect by my own experience.

M. Decneanras, in his Observations sur le genre Lis, p. 57, thinks that the varieties Gallica and Takeda may be distinguished by the angle formed by the ovary and base of the flower, and another variety, named Wilson, is also remarkable for the size and number of its flowers.
In the Rev. Marra's collection of Chinese plants I found some specimens gathered at Kinsaing, which appear to hold a somewhat intermediate position between L. longiflorum and L. Brown, having a more open flower than the former, and being apparently tinted with purple outside. Detailed specimens of these, however, are so difficult to determine with certainty, that I cannot be sure whether this plant is merely a variety or not.

From Mr. Parkinson of Vermont I have received a variety sent to him from Japan, which is said to have yellow flowers; and in some Japanese native drawings a similar plant is represented; but I have not as yet had the good fortune to see it known in any European garden.

A form with white-margined leaves is occasionally introduced from Japan, where the art of inducing variegation in the foliage of plants is better understood than in Europe. Mr. Horse tells me that he has never seen L. longiflorum growing wild in that country, though it is common in gardens and known by the name of "Teppa-Yurei" or "Gun-Lii," from its long tubular flowers.

The mode of this species, though seldom grown in England, are much more rapid in the growth than in the case with most kinds. I believe that, in three or four years at most, it will be produced if the young plants are properly treated.
LILIUM BULBIFERUM.

THE BULBIFEROUS LILY.


J. bulbiferum, Link, Ann. 3. 194.

J. bulbiferum, Miller, Dict. no. 6.


The bulbiferous Lily, though well known both to botanists and gardeners, is a plant of rather limited range in the mountains of Central Europe, and is found, as far as I can discover, only in the eastern cantons of Switzerland, the Tyrol, and the lower Alps of Savoy, the Venetia, and Bavaria. From Mr. G. M. Benthall, I learn that the only localities where he has found it growing are Vals, in the Tyrol, and the Val di Ledro, at the head of the Lago di Garda, where a very dark blood-red variety, nearly bulbiferous and nearly glabrous, is found.

Mr. G. C. Gussone, whose knowledge of the flora of Central Europe is unsurpassed, tells me he believes the localities in Western Switzerland and the Maritime Alps, given by authors for this plant, really refer to L. cernuum or its variety chinense. Gussone (in his "Flora of Switzerland," 2nd edition, 1874), who I believe to be the most trustworthy authority, gives only three localities for L. bulbiferum—Tarasp, Lienz, and Fuldera, all of which are in the cantons Uri, Tartar, and Nendaz, all of which are in the cantons Uri, Tartar, and Nendaz, all of which are

The form ranges from about 1000 to 4000 feet elevation, and is usually found on the borders of streams and lakes, sometimes running into distinct patches with deep grooves, here and there. It is usually found in a wild state in East Greenland, though doubtfully.

The varieties of L. bulbiferum are not numerous, and the parentage of some that are supposed to have arisen from it is doubtful.

The Lily known as L. umbellatum, which is the most floriferous of all this section, flowering as many as forty or fifty flowers in a bulbil, but flowers at the same time as L. bulbiferum, shown to twenty days before L. cernuum.
There is a curious little stunted plant, which I take to be *L. humile* of Milla, occasionally seen in gardens; this resembles *L. bulbiferum* in its principal characters, though much smaller and, as far as my experience goes, later in flower. Except as a curiosity, it is not worth cultivation.

*L. pubescens*, of Humile, is another plant sometimes seen on the Continent, and apparently a variety of *L. bulbiferum*, from which it differs by being more pubescent. What is known as *L. rubellus var. incaerulea* is, I think, one of the finest of Garden Lilies, and a most desirable plant. It is, perhaps, a hybrid between *L. bulbiferum* and *L. rubrum*, and will be noticed with one of the varieties of the latter species.

The cultivation of *L. bulbiferum* is extremely simple; it succeeds well in the ordinary soil of the garden, and is rapidly increased by the bulblets, which, if planted in good soil, come to flowering size in two or three years.

The plant figured below in my garden in June 1875, and was selected as showing the typical character of the species better than one with a large number of flowers.
LILIIUM HUMBOLDTII.

HUMBOLDT'S LILY.


Bulbous rhizome, 2-4 poll. ovatum, hemispheric, elongata, lateris scopulis tansem insidiose, a squamae distichis mappis inicia 2-3 poll. large, oblongo-oblanceolatis confluentis. Odor torus, rubescens 4-5 poll. globosus vel globosus, viscosus vel argenteus. Folia expansio, angustiora verticillata, in verticillis 4-5, 10-16-foliatos disposita, oblongo-lanceolata, inferius 3-5 poll. longa, superius 9-12 poll. longa, seminis, ser. incisum, terminalite, seminis sexangulati, ad libitum Schizocarpi infrum incisus. Flores multiflori, interdum 6-20 in subumbellato utroco pressus, seminis albae dispositus, pedunculis oblongis, oblongo-lanceolatis, utroco pressis. Inflorescences, 8-9 poll. longae, foliis oblongo-lanceolatis usque 15 poll. longae. Rudis 1-5 poll. longa, superius 9-12 poll. longa, stylis 6-7 poll. longis, ovario eubtriplo brero Capitulorum choris, more 2. Harto acute Gangulata.

Habitat California, montibus Sierra Nevada, 2500-3500 pedum altitudine (Rot et Kettler). Var. oes x insula Santa Ron, est forma punctis ornata.

Dr. Holman, in ‘The Garden’ for Jan. 3, 1874, has given an account of its native habitat, that I will quote him verbatim — ‘This large species has apparently a far less wide range than L. Maripponum. It occurs mainly on the more elevated portions of the foot-hills of the Sierra, from 3500 to nearly 5000 feet altitude, evidently requiring a greater amount of heat to develop its full beauty than the others. The soils in which its bulb is found are of a rather compact character, consisting of clay with an admixture of broken rocks and a small portion of vegetable mould. Growing in open park-land, or land partially cleared off, and therefore exposed to a dry and exsiccating air, we find its bulbs also at a considerable depth. The soil itself is very large and strongly built; its water vessels are larger, imbiberate, lanceolata, tinged with purple and very strongly, well calculated to hold a large supply of moisture. A short time ago this species was also found by Mr. Howard on the Island of Santa Rosa, opposite Santa Barbara. As far as I know, it has not yet been found on any part of the coast ranges. The plant from Santa-Rosa Island differs but very slightly from that on the foot-hills of the Sierras. Its leaves are of a brighter green, acuminate; and its whorls are denser and more regular, while the leaves of plants from the Sierras are rather spatulate, and terminate with a blunt point. The flower is exposed to sun-bronze and fogs, the latter to a dry air. The bulbs
The bulb of *Lilium Humboldti* is very remarkable, not only on account of its great size, but because of its peculiar shape and structure, which has been well described by Prof. Duemmerring, in his Observations such as those in *Flora des Serres*, vol. xix. p. 1973, reports the bulb to be so large and broad that it can be used as a representation of the species.

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The cultivar of *Lilium Humboldti* is very remarkable, not only on account of its great size, but because of its peculiar shape and structure. This has been well described by Prof. Duemmerring, in his observations such as those in *Flora des Serres*, vol. xix. p. 1973. He reports the bulb to be so large and broad that it can be used as a representation of the species.
Lilium Columbianum
LILIUM COLUMBIANUM.

THE OREGON LILY.


Habit a perennial, potted plant, sparsely in multi-loculate, Camellia-like, small, white, glabrous. Dolla small, in sessile, 2-3-sepalate, petals, white, white, petiole, 1-2 cm long. Flowers 2-4 cm across, petals 2-3 cm long. Stamens 2-4 in number, filaments slender, included, anthers bright yellow. Pistil 1-2 cm long. Ovarium globular, 3-4 cm long. Capsule 1-2 cm long, 1-2 cm across.

Habit Oregon (Loro; Rorzs). Cascade Mountains. Colombia Britannica (Lata; Dovana Bull ovoid, perennial, composed of narrow, pointed, compressed sales, which apparently grow on one side only, as in L. humboldtii and L. Washingtonianum. Stem h, green, glabrous. Leaves in whorls of 4-8, or scattered, oblanceolat

The Oregon Lily has been for some time in herbaria, and by most botanists considered a variety of L. canadense; but there can, I think, be no reasonable doubt that it is quite distinct from that plant, and from any other—not so much on account of its flowers as because of its bulb, which resembles that of no other American species.

It is a native of the coast and interior of the State of Oregon, Washington Territory, and British Columbia, from about 40° to 50° N. latitude, and has been gathered by many explorers of those regions. I learn from Mr. R. Brown that it is found on dry sandy plains, and on the mountains up to 5000-6000 feet elevation, where the climate in winter is very severe, and where rattlesnakes are so abundant in autumn that it was a work of much danger to dig up the bulbs.

It was first sent to Europe in 1872 and 1873 by Mr. Hasson of New York, who gave it the name of L. columbianum, because it was found on the banks of the Columbia river; and was described by Mr. Maxon from a plant which flowered in Hanover, England. It was described in 1874.

In referring the plant known as L. canadense parviscapa, Hook., to this species, I am guided by numerous specimens in the Herbarium at Kew, collected by Fraser and Wallis, the bulbs of which even in a dry state can be distinctly recognized; but no botanist who had not seen the species in a living state could have separated it specifically with any certainty, as the whole plant much resembles weak or starved varieties of L. pardalinum or L. canadense. This, however, is not undistinguishable as in those species, but has more affinity to that of L. humboldtii, of which the plant is perhaps a miniature northern representative.

In this country it proves perfectly hardy, and is easy to cultivate in the same soil and situation which suits L. pardalinum. It varies considerably in the size and shape of the leaves (which are nearly rounded, but sometimes pointed), and in the form and shading of the flowers; but out of a large number of bulbs which were kindly sent me by Mr. Hasson, not one presented any noticeable difference from the type, which is well shown in my plate. The plant here figured flowered in July 1875 at Mr. Buxton's nurseries in London, but as I was not then quite sure about its identity, I waited until I knew more about the species before writing on it.

The two varieties, of which single flowers are shown, were grown in my own garden in 1877, and proved good plants.
LILIUM SPECIOSUM.

THE LANCE-LEAVED LILY.

1. L. speciosum, Humb. in León Trans. ii. 382; Hook. (Reg. i. 200); var. in Linn. Fl. Jap. 1864, p. 31. b. 12. 13. 4. fig. 1; Hook. Mag. 375; Mag. des Scienc. i. 276; Botan. Journ. xiv. 1874, p. 255.


1. superbum, Thunb. PL Jap. p. 134, non Linn. Za

2. lancifolium, Mussch., Past. Mag. v. 207, non Hort et Thunb. ¡amis Janecolatis pellicom 1

өлігіне petiolata, petilo ad caulem w

blongo-lanoeolata зема vl acuminata, nitido viridi inferiora 5-8 poll. longa, medio 15-18 а. mdo glabro. Filamenta
to divergent, 24-4 poll. longa, anth mtis 0-12 lin. longis, pollino croceo vel ки

Ovarium 1 poll. longum: itus

Mob. Japonia, a Corea introducta (fide Kurse). China: pro. "Kiangi" (алек; Davro). De formis cultis vide int

Balb perennial, globose, twn or

ich brown, 2-4 inches in diameter, composed of thick lanceolate stem 2-5 fet,

1-2 inches broad below the middle, bright green, glabrous distinctly v тік, rounded at th

Peduncles bractente; rigid, em š inches long the upper uns shorter. Perianth 3-5 inches long, th

the points much need,

nter divisions 12-21 line um

ier broader. Tho lower half of Ше corolla covered with mi

[HOUGH this plant is usually supp

d to be a native of Japan, I learn from Pror. Maxi

mowicz that he never found in that country except in gardens, and is said by the Japanese to come from the Corea, on

which account they call it "Noraijuri." Corean Lily. Tnexmene says that the white form is from the Loo-choo ehipelago ; but I do not think it is a native of those islands,

The only locality from which it has been recorded as an indigenous plant is Kikking, a town on the Yang: tse-kiang river, in at. 29° 54 N., long. 116° E, whereit was discovered by Da. Наков. 'The Anni Davin informs

me that he found it sparingly near the same town in valleys of moderate elevation; and the dried specimens in hi

herbarium, though much dwarfer and somewhat smaller than the cultivated plants, them perfectly

general character. It was first introduced by Vox Srenotn, who sent it to the Botanie Gardens of Ghent in 183

was described and figured in several of the botanical journal

So beautiful a plant was not long in becom

sate, has held its place in popular favour when Lilies were little cared for, and is now cultivated

des of H Belgium

forsale on a very large seale in the bul

OF its culture I need say little, having given a full description ment of Lilien owais

which is equally applicable to this species. Although its constitution is not so delicate, it is generally seen

to greatest perfection under glass, and has degenerated considerably in the climate of Holland, where it is treated an ... It is increased without difficulty by means of offsets, offsets, and seeds, though the latter are rarely matured in the open air of this country.

The varieties of Е. speciosum are numerous, and have mostly ascended in Japan, as is proved by the many

drawings on silk often and home from that country. They have been carefully studied by Dr. Maxwena, wh
I published the results of my examination in the "Gardener’s Chronicle," 1872, p. 112, and arranged them in the following table:

<table>
<thead>
<tr>
<th>Variety</th>
<th>Description</th>
<th>Parentage</th>
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<tbody>
<tr>
<td>1.</td>
<td>Rubrum</td>
<td>&quot;Species rubrum&quot;</td>
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<tr>
<td>2.</td>
<td>Sanguineum</td>
<td>&quot;Species sanguineum&quot;</td>
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<tr>
<td>3.</td>
<td>Alba</td>
<td>&quot;Species alba&quot;</td>
</tr>
<tr>
<td>4.</td>
<td>Pictum</td>
<td>&quot;Species pictum&quot;</td>
</tr>
</tbody>
</table>

This arrangement, though not including some of the slight varieties now cultivated, is a very good one, and will enable any one to distinguish them without difficulty. As, however, a more detailed description is necessary, I will say a few words about them separately.

1. L. speciosissimum, Bart. Mag. v. p. 1872, is a species, var. speciosissimum, and is superior to the majority of those commonly grown. It is distinguished by the following marks: a pink ground, and very richly coloured spots. Time of flowering rather later than usual. This variety is largely grown at the Knap-Hill Nursery, Woking, where it may be seen in perfection, and thrives in the peaty soil which is largely Knap-Hill Nursery, Woking.

2. L. speciosissimum, Bart. Mag. v. p. 1872, is much like this, but the flowers are not so brightly, distinctly, or evenly coloured, or so perfectly formed. It is probably a somewhat deteriorated form.

3. L. speciosissimum, var. speciosissimum, Bart. Mag. v. p. 1872, is a species, var. speciosissimum, and is superior to the majority of those commonly grown. It is distinguished by the following marks: a pink ground, and very richly coloured spots. Time of flowering rather later than usual. This variety is largely grown at the Knap-Hill Nursery, Woking, where it may be seen in perfection, and thrives in the peaty soil which is largely Knap-Hill Nursery, Woking.

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LILIUM CANADENSE

THE CANADA LILY.

L. canadense, Linn. No. 455; Bot. Mag. t. 800 et 868; Bory, Hist. Nat. t. 192; Planches du Serres, t. 174; A. Gray, Man., p. 85.

Botan. Amer. i. 5; Bory, Hist. Nat. t. 192.

This L. canadense is perhaps the best-known of all the American species, and has been in cultivation since the time of Parkinson, who, in his delightful *Paradisus, or Garden of Pleasant Flowers,* published two and a half centuries ago, describes it under the name of *Lilium martagon canadense.* It is one of the commonest species all through the eastern states, from Canada to the mountains of Georgia, and as far west as the Missouri river, and probably at a higher latitude even farther. According to Mr. Lawson it is also found in the Indian territory, but I have seen no specimens of the typical plant from that part of America, and I am inclined to think that it is replaced there by forms of *L. penduliforum.*

Both annually produced at the end of long or short stolons, composed of thick, white scales. Stem 13-4 feet high, erect, green, branched, glabrous. Leaves alternated, elongated, green, ovate, 8 to 12 inches long. Flowers 1 in a whorl or corymb, on pedicels 3-0 inches long, usually bracteolate. Sepals 1 1/4 inch long, navicula to 1/2 inch longer, stylo suberecto, panlo brevis. Capsule about 1 1/2 inch broad, rounded at the top, with very sharp angles.

This Canada Lily is perhaps the best-known of all the American species, and has been in cultivation since the time of Parkinson, who, in his delightful *Paradisus, or Garden of Pleasant Flowers,* published two and a half centuries ago, describes it under the name of *Lilium martagon canadense.* It is one of the commonest species all through the eastern states, from Canada to the mountains of Georgia, and as far west as the Missouri river, and probably at a higher latitude even farther. According to Mr. Lawson it is also found in the Indian territory, but I have seen no specimens of the typical plant from that part of America, and I am inclined to think that it is replaced there by forms of *L. penduliforum.*

It grows in grassy flats, sandy meadows, and marshy places, but not in such wet ground as *L. superbum,* and is an extremely variable plant both in bulb and flower. There are several well-marked varieties, among which the following are most conspicuous. *L. canadense rubrum,* figured in Bot. Mag. t. 858, is usually a small and few-flowered plant, and is found, as Mr. Lawson tells me, in dry meadows along the Hudson river. *L. canadense florinum,* as figured in my plate, fig. 3, a small plant, with the flowers of an Indian-yellow ground-lily, and the divisions of the perianth not much reflexed; it is common in all the eastern States.

The curious narrow-petalled variety (fig. 2) is from Long Island, New York, where Mr. Lawson tells me he has seen it, and it is also very different from the other, and more resembles the bulbs of the typical form. The bulbs of this variety are usually much larger and more compact than in the typical *L. canadense,* and grow in wetter ground. Mr. Lawson tells me he has found it at Green Bay, Wisconsin, and elsewhere. In Mr. Lawson's garden I observed a very similar form which had been sent to him from Haynes, Ontario, and in the herbarium of the Jardin des Plantes in Paris belongs to a specimen of this type from Core Valley, Pennsylvania, with petals a few long.

The curious narrow-petalled variety (fig. 2) is from Long Island, New York, where Mr. Lawson tells me it is abundant; and its bulb, which I have shown in fig. 3, is also very different from the other, and more resembles the bulb of the typical form. I have no doubt many other well-marked varieties have been found, but I do not think they will ever be classified with *L. pumila* or *L. columbianum.* Of the plant described by Mr. Lawson I know nothing, and should rather take it to be a form of *L. martagon,* which, though planted under *L. canadense,* by the same author, is, I think, I have shown in a previous number of this work, an entirely distinct species.
In studying the varieties of the American Melandrium Linne, it is useless to rely upon the characters shown by a few specimens. The more I see of these the wider my views as to the constancy of so-called species become: so that without a minute knowledge than we now possess of the climate, soil, situation, and other causes regulating their distribution, it will be useless to lay down fixed rules as to their classification.

The culture of L. connumee does not at present seem to be very well understood in this country. Though it is of course perfectly hardy, and often thrives freely for a year or two, it does not seem to be able to establish itself or to increase in this country. It may be that our springs and summers are too cold, and our autumns and winters too wet, for this as for many other plants of the United States: or, like some other Lilies, it may be not truly perennial, and therefore dies naturally, after flowering and seeding abundantly.

The seed germinates very slowly, usually after the expiration of eighteen months from the time of sowing; and the young plants show no show of growth and difficult to keep.

The best varieties figured in my Plate, for which I am indebted to my excellent correspondent Messrs. Peirce and Hinson, furnished in my garden in July and August 1870.
LILIUM AURATUM.

THE GOLDEN-RAYED LILY.


Bulb perennis, globosus, 2-4 poll. longus. Stemmata vel seminaria, seminae in uncinis dicta, fructus fere in uncinis distinctus. Perianthium 6-7 poll. longum, margine sessile vel curvato, in uncinis 8-9 poll. longis, frutex viridis vel purpureo tinctus, gracilis, teres glaber. Poli 20-10 poll., interioribus latioribus, abi, medio epi 1-3 poll. glabris. Perianthium 6-7 poll. longum, margine sessile vel curvato, in uncinis 8-9 poll. longis, frutex viridis vel purpureo tinctus, gracilis, teres glaber. Poli 20-10 poll., interioribus latioribus, abi, medio epi 1-3 poll. glabris.

He, Japonia in collibus apricis, forma adeunt foribus rubro-rubris, forma albis et plurimae varietates adhibent. Bulb large a globosum vel asperatum, e pred "delexed", the large 6-0 inches long, 0-15 1i those of Zalens in a. A texture bat usally narrower, with 5 petals at the base to a short distinct petiole, narrow erecto putent, bracteolata, 3-4 inches long. Perianth le middle. The colour is, in the ordinary form, white, with a distinct central band of yellow, and numerous pink x em m e varieties with a pink or ed з bond, and others with а very pale lemon band, bos me puis vii ver part of the perianth-tegments covered with papille, and a green keel or midrib at the ck. Flower when expanded 8-13 inches acros, strongly and pleasantly scented, Fila е kopi sai 1 inch; pollen scale or hocolatored; ovary 12-10 inches long; style 3-4 inches. Capsule 2-3 inches long, 3-4 inches long, almost round, the base of the perianth-tegments covered with papille, and a green keel or midrib at the back. Flower when expanded 8-13 inches long, 0-15 inches long, almost round, the base of the perianth-tegments covered with papille, and a green keel or midrib at the back. Flower when expanded 8-13 inches long, 0-15 inches long, almost round, the base of the perianth-tegments covered with papille, and a green keel or midrib at the back. Flower when expanded 8-13 inches long, 0-15 inches long, almost round, the base of the perianth-tegments covered with papille, and a green keel or midrib at the back.

Though one of the commonest wild flowers in many parts of Japan, the golden-rayed Lily was not introduced into Europe until the year 1860 or 1861, when it was first sent over by Dr. Voss, nozzle Lilium auratum to the Linnean Society of London, where it arrived in fair condition, Messrs. Verricci and Sox, of Chelsea, knowing their value, bought nearly all that were offered for sale, and exhibited the first flowers that were produced in 1862, when it was named by Dr. Lindley, "Lilium auratum."
king, bad cultivation. Since then millions of bulbs have been imported; and though the loss from care and the natural delicacy of the plant has been something terrible, there is hardly a garden, large or small where this plant is not grown and valued. In its own country it is abundant, growing almost by mere in some of the woods, and in a light moist soil on the hills near Yokohama. It is called Yama-Jur, or Hill-Lily, by the Japanese, who, though great lovers of Lilies, do not, according to Mr. Robinson, one of the principal exporters in Japan, grow this species in their gardens so largely as to some others.

The Lilies are collected from the environs of Yokohama and other places about the end of October in great quantities, and packed in boxes of 200 or 300 to send to Europe. If the season is wet, the bulbs do not properly ripen, or the ears exposed to much heat on the voyage, as is too often the case, the majority arrive rotten; and I venture to say that hundreds of cases are lost almost every year from one or other of these causes.

A new way of packing, however, has now been discovered, by which the bulbs arrive in England almost as fresh as when they were taken up. Many thousands have been sold at Messrs. Swartwout's rooms during recent winters in splendid order, and at a price so low that there can hardly be much profit to the exporters. Formerly they were packed in a loose yellowish earth, which filled up the space between the bulbs, and kept them firm in the box; but now each bulb is contained separately in a ball of mud or clay, which hardens in air, preserves it in a perfectly firm and fresh state.

Still there is something in the constitution of this plant which seems to make it very liable to decay and death; and the number of bulbs that perish annually in England would hardly be believed. In a dry season like 1874 they sometimes get quite seared, the leaves withering, and the stem and flower-buds wilting, without any apparent cause. Out of a batch of 20 or 30 plants perhaps only 5 or 8 will remain alive two years after their arrival at Enagland; but if well managed, will soon improve and increase till they produce magnificent specimens. The cause of this disease does not seem to be yet fully understood, but the most skilful gardeners have suffered from it, and though in some instances upon the Golden-rayed Lily will probably live and thrive permanently, it does not seem to find the soil and climate of England generally congenial to it. About its hardiness, however, there is no doubt; and as there is no difficulty in raising it in large quantities from seeds on scale, I do not think we are likely to run short of it even if the annual supplies from Japan should fail.

With proper treatment and attention I believe the Golden-rayed Lily can be grown to greater perfection in pots than in the open ground; and though this is of course the most troublesome method, yet the plant is so well suited to the decoration of conservatories and halls that it is the one chosen by most people.

The treatment that I have found by experience the most successful is as follows:--On receipt of the bulbs, which should be purchased early in the winter (some growers now being in most cases to be preferred to imported ones), they should be potted singly in pots from 5 to 8 inches in diameter, according to their size. The pots must be well drained, and filled about three-fourths of a mixture of loose fibrous peat and soft yellow loam, well mixed with coarse silver sand. The bulb should then be put in and covered with the same compost to within 1 or 2 inches of the rim. The pots should then be plunged in ashes, cocoanut-fibre, or some similar substance, in a cold frame, orchid-house, or shed where the frost cannot enter, and covered up with leaves or straw. In from two to three months they will begin to shoot, and should then be uncovered, and placed in a light and airy place, and not much exposed to the direct rays of the sun. Water must be given sparingly at first, but when the stems are well advanced and sufficient supplies are necessary, and the soil from the first to last must never be allowed to get hot or dry. Aphides, which are very fond of and injurious to the young growth of Lilies, must be carefully sought for and destroyed, or they will injure the flowers. As the stems begin to show out from a good surface-dressing of Egypt compost, manure, and very weak liquid manure may be occasionally given, if the plants are well rooted and growing freely; otherwise it does harm; and it must never be used too freely.

During the growing season the plants should be kept in a cool greenhouse, and well syringed at night, or may be plunged out of doors in a sheltered and half-shaded position, where they will bloom later. If they grow very strong, they may be shifted to larger pots without injury about May or June; and when once well rooted they thrive better in large pots than in small ones, as the soil is kept in a more regular state of moisture. If, however, a number of imported bulbs are potted together in one pot, they will probably flower at different times, and so spoil the effect.

The greatest care must be used with bulbs that have been grown two or three years in England.

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*A letter from Mr. Haygood containing the following letter to Mr. Haygood, one of the principal exporters in Japan, about the variety of Lilies that is now cultivated by them (transcribed by the author)*
and these frequently attain a height of 6 to 7 feet, and produce as many as 20 to 25 or even more flowers on a single stem. They vary much in size and colour, as well as in habit—some plants bearing flowers only at the top of the stem, and others nearly halfway down it.

After flowering, the pots must by no means be neglected or allowed to become dry, as they so often are. Their success in the ensuing year depends to a great measure on the roots being active for as long a period as possible, and this is only to be ensured by careful watering. If they are repotted annually, which is the practice of many growers, it should be done as soon as the stems have completely withered, and with as little disturbance to the roots as possible. The stem, however, should always be cut off close to the bulb, removing with it the mass of roots, which, having fulfilled their function of nourishing it during the growing-season, are now useless. A fresh compost being put in, the pots should be returned to their winter quarters, and kept in a state of gentle warmth, neither dry nor wet, until the new growth again appears.

As regards the conditions under which this plant succeeds best outdoors I cannot do better than refer my readers to an account of the garden of James McArthur, Esq., at Oaklands Park, Weybridge, which was published in the ‘Gardener’s Chronicle’ for December 1876.

The extraordinary success which has been obtained here is in my experience unequalled, and is, I think, due principally to the soil and situation of Mr. McArthur’s garden, which slopes gently to the north, and is well sheltered by trees from wind. The soil is very light, but always moist below; and the Lilies are planted on the edges of rhododendron-beds, where they are protected from spring frosts and the soil is sheltered from the sun. Here they attain a height of 6 to 7 feet, bearing commonly 20 to 25 flowers on a single stem, and flowering at various times from July till the end of October, the middle of August being the time when they are usually seen in the greatest perfection.

Lilium auratum ripens seed freely under favourable conditions, and may be propagated in this manner with moderate ease, though the seed often lies for more than a year before germinating. I have not yet been able to ascertain the reason why seeds ripened and sown at the same time vary so remarkably in the period of germination. A few usually come up in the first season, and the majority in the second, but some for dormant for as much as thirty months.

The plant which I have figured is by no means so fine as is often seen, either in the number or size of its flowers; but a Plate of double this size would not contain a really large specimen.

The variations are so numerous that hardly two plants in fifty will be exactly alike; but no striking departure from the typical form exists.

The plant known as L. rubroitatum is an extremely scarce and beautiful variety, which I hope to figure in a future Plate. It has the yellow band replaced on the upper part of the petal by more or less deep red, in some cases a distinct crimson band appearing; much more frequently, however, the red that is pale, and fades after the flower has been out a few days.

A somewhat similar and even more beautiful variety was figured in the ‘Floral Magazine’ for November 1876, under the name of L. auratum cruentum, differing from the last in the crimson band, which in the centre is extremely dark, being continued to the very base of the petal.
LILiUM ELEGANS.

THUMLER'S LILY.


Both white, resembling those of L. bulbiferum and L. Thunbergianum, but smaller. Stem 8 to 12 inches high, round, rigid, velvety, slightly shaded with brownish pubescence, but not so much with L. bulbiferum. Leaves very small, thick, narrow, and entire, but usually from 20-24 in number, and about 3-1 inches long by ½ inch broad. Flowers numerous, from one to twelve or more, very varied in colour and size, ranging from pale apricot to dark reddish crimson, and more or less spotted with brown, black, or red. Petals four, triangular, opening from the base, ½-1 inches long, ½-1 inch broad, more or less convoluted on the back, and sometimes deeply fringed, papillated in the throat. Anther ½-1 inch long, style 1½-2 inch long, stigma 1½-2 inch long, pollen red or yellow. Capsule usually distinguishing itself from those of allied species by its flat and not conical top.

This plant which is here described under the name of L. elegans is one that has been long cultivated and well known by the name of L. Thunbergianum, but as, in Mr. Baker's opinion, the description and plate published by Texereau of L. elegans, as well as the type specimens in his herbarium, can be referred with certainty to this species, the term of scientific nomenclature cannot be changed. I do this with the least regret, as the name of L. Thunbergianum is a well-known and common, and the distinguishing features for which this name has had so many other Japanese plants named after him that there is no fear of his researches being forgotten.

This plant was treated by Mr. Baker in his first review of the genus ('Gardener's Chronicle,' 1871) as a subspecies of L. bulbiferum; and this opinion, though modified afterwards in well worthy of mention from the fact that Thuinier himself was not sure of the specific distinction of his plant, and also because the wild varieties found in Japan can hardly be distinguished from the European L. bulbiferum except by the absence of autumn yellow. As, however, it has developed so many varieties very distinct in appearance from L. bulbiferum or L. chico, and is so widely scattered in its geographical range from either of them, I think that, for all practical purposes, it is much better to consider it a distinct species.

Lilium chico was first named known in Europe by Teudoreau, in a paper published in 'The Memoirs of the St. Petersburg Academy of Sciences,' 1811, called 'Báulm Lilium Japonicum,' but it was not introduced until 1831 or 1835, when Van Heevo sent it to England with L. japonicum and others.

Being an extremely variable plant both in form and colour, and one that has been long cultivated in Japan, a host of varieties have been imported from time to time, and have been considered by several botanists as distinct species. As, however, no good characters can be found to distinguish them, and many of the garden names have been applied without description to the same or different varieties, I shall only give a list of those which seem to have the most marked features.
I have studied the numerous forms of Orange Lilies cultivated in the gardens of England and the Continent, with much care, and have to thank especially Mr. Whiston, Mr. J. H. Kewick, of Harewood, and Mr. R. Penn, of Kew Street, Curzon Street, for the kindness they have given me in visiting and examining their large and well-grown collections; but though the paper by Messrs. Baker and Dyer in the "Gardener's Chronicle," 1852, p. 925, founded on a study of Mr. Penn's collection, names and describes a good many of them, I am unable to follow it in all respects. The fact is, that the Japanese Orange Lilies have been crossed extensively with the European ones, and it is therefore impossible to refer many of the garden forms to either species. One thing, however, I think probable is, that the forms grown under the name of Z. davuricum have, with one exception, nothing to do with the true Z. davuricum of Siberia (which has a very different bulb), but are more likely hybrids between Z. elegans and Z. recurvum.

The varieties of Z. elegans which I think most distinct and worthy of notice are as follows:

1. Z. elegans, as figured in the "Botanical Register," ed. xxiv. t. 38. 1 1/2 feet in height, with broad leaves, downy stem, and unspotted flowers of a deep reddish orange. This may be considered the type of the species.

2. Z. elegans, var. Moore, Floral Magazine, t. 191. Under a foot high. Stem pubescent, leaves crowded; flowers violet towards the edge, orange in the middle of the petals, with few spots.

3. Z. elegans, var. roxianum, Baker and Dyer (Z. Thunbergianum roxianum, Moore des Serres, t. 1897, and grown under this name in the Dutch and Belgian gardens). The dwarfest form of all, under a foot high, with two or three large, apricot-coloured flowers freely spotted with black. A most desirable and showy form.

4. Z. elegans, var. Alice Wilson (hort. Wilson). Resembles the last in colour, but brighter, with fewer spots, and considerably taller. A very pretty variety, which I have only seen in Mr. Wilson's garden.

5. Z. elegans, var. emigreum, Lindl. Bot. Reg. 38. t. 90 (Liliputian hort.). A fine, darkred variety, of moderate height, with open segments of a deep red colour, moderately spotted, but not so dark as the next.


7. Z. elegans, var. fulgens, Kunth, Enum. iv. 965; Flore des Serres, t. 657 (= fulgens, p. 29); Lem. I. Hort. t. 422. The latest variety of all, coming into flower a fortnight after the others have done blooming, and taller than any of the others, quite globose, and bearing 4-7 flowers, which are clear red without spots.

8. Z. elegans, var. pardinum, Moore, Flora & Pom. 1858, p. 121 (W. Wilson Hort.). This variety differs from all others in its habit and general appearance, as well as in its colouring, which resembles that of Z. lidyiandu. It is quite possible that this may be a hybrid between Z. elegans and some other species; but in the absence of any information on the subject, I prefer to leave it in this species for the present.

There is also a monstrous form, Z. fulgens, var. pardinum, Lem. III. Hort. t. 422, in which the elements are changed into imperfect petals, but it has no beauty to recommend it.

I am indebted to Prof. Maximowicz, of St. Petersburg, for the following notes on Z. elegans as observed by him in Japan. "It is very near Z. davenii, whose capsule it has, but seems to differ by the narrower wing of its seed, broader leaves, in the spathes, and often also in the cultivated plant in the flowers, which are red throughout, and not yellow at the base as in Z. davenii, and in the less-pubescent pubescence; but the principal difference is the solid bulb. I have this species wild, only from the north of Nippon, from two localities, where it seems to grow in clumps only; but it is cultivated in many varieties throughout Japan. The wild plant is a span high, the flower red, with dark spots. The cultivated ones are taller and very varied in colour."

"The Japanese distinguish also a spring and a summer form. The former, with narrower leaves and
a more open flower, they call 'Haru-sukashiyuri,' and the latter, with broader leaves and narrower flowers, 'Natsu-sukashiyuri.' I have not seen this second form.

"L. bulbiferum," with which L. elegans was often confounded, differs remarkably in its elongated capsule, which is deeply umbilicate at the apex, and sometimes (not always) by its axillary bulb.

"L. dahuricum," C. A. Meyer, is also found abundantly on the island of Tsushima, where it grows in gravelly places. In crevices of rocks and on borders of stony woods. It is possible that some of the varieties of L. elegans have been bred in Japan between this species and E. dahuricum, in the same way that they have in the north of China. There is reason to suppose that a Lily of this type is found in a wild state in the north of China; but having seen no dried or living indigenous specimens from that country, I cannot be sure to which species it belongs.

The cultivation of L. elegans and its varieties is easy; it requires nothing more than a good rich sandy soil, well drained, but not too shallow; and though it sometimes grows well in a peaty soil, it is not necessary for this as for some Lilies. In pots it also grows well if properly attended to, and produces seed which germinates quickly, and grows more rapidly than in the case of the Martagon, though great care must be taken of the young plants in their earlier stages.

My first Plate represents three varieties: on the left hand is L. rubescens; in the center, L. alutaceum; and on the right, L. atrosanguineum—both of which were drawn from plants which flowered in my garden in 1876.

The second Plate represents the variety Alice Wilson on the right,—on the left the variety L. incomparabile, which I believe to be a hybrid between L. elegans and L. bulbiferum; on that account I have not mentioned it among the varieties of this species, though for garden purposes it is one of the best forms which are commonly grown.
LILIIUM CORDIFOLIUM.

FOR HEARTLEAVED LILY.


This is a L. giganteum, but smaller and composed of fewer parts. It has 3-5 feet high, not related with leaves to the base, but having 2-3 large leaves of a form about 3 feet from the ground, and smaller ones scattered over the bottom of the inflorescence. Leaves shining glossy green, with a purplish tinge at the base, composed of a broad flat petiole, base nearly 3 feet long, prominently cordate, roundish or oval, the edge crenate with purplish, yellowish, and purplish yellowish, usually from 3 to 5 inches long, in 6 or 8 in parallel, plicate, and short, blunt, hairy. Raceme large, spreading, falling before the flowers expand. Peduncle 2-6, 2-8 long, with a base outside, tinged with green towards the base, segments obtuse, obtuse-oblong, spreading, falsely in the upper half, narrow gradually to the base, the three outer are yellowish, inside at the base, and spotted with purple, without any papilla or distinct groove.

Stems parallel, slightly cuneate, a little shorter than the peduncle, with a purplish tinge, solid, parallel with the segments, and a little larger, strongly exalate, oblong, obtuse. Raceme 1-2 inches long, narrowed to the base and top, with 5 distinct keels, which (see Fig. 1 and H. 1) give the appearance of hair from that of any other Liliaceae.

This is not a coastal plant, but is found very near the Himalayas. L. giganteum, having 3-5 feet high, not related with leaves to the base, but having 2-3 large leaves of a form about 3 feet from the ground, and smaller ones scattered over the bottom of the inflorescence. Leaves shining glossy green, with a purplish tinge at the base, composed of a broad flat petiole, base nearly 3 feet long, prominently cordate, roundish or oval, the edge crenate with purplish, yellowish, and purplish yellowish, usually from 3 to 5 inches long, in 6 or 8 in parallel, plicate, and short, blunt, hairy. Raceme large, spreading, falling before the flowers expand. Peduncle 2-6, 2-8 long, with a base outside, tinged with green towards the base, segments obtuse, obtuse-oblong, spreading, falsely in the upper half, narrow gradually to the base, the three outer are yellowish, inside at the base, and spotted with purple, without any papilla or distinct groove.

Stems parallel, slightly cuneate, a little shorter than the peduncle, with a purplish tinge, solid, parallel with the segments, and a little larger, strongly exalate, oblong, obtuse. Raceme 1-2 inches long, narrowed to the base and top, with 5 distinct keels, which (see Fig. 1 and H. 1) give the appearance of hair from that of any other Liliaceae.

The form and position of the leaves, the shape of the flowers, stamens, and capsule are all very different from those of the Himalayan species; and though I shall not be surprised if intermediate forms be discovered in China, we have every reason for treating the plant as a distinct species. It was originally discovered in Japan by Thunberg, who at first called it a Hemerocallis, and has since been found by several other botanists, not only in Japan, but also, as I am inclined to believe, in China.

In Japan it grows, as I am informed by Mr. T. Hano, near Hakodate, on the island of Yesso, and in other parts of the northern islands, but more rarely in the mountainous districts north of Yesso.

Mr. Maximow also found it in the same localities, and tells me that it grows most luxuriantly in deep, cool, shady woods, where the bulbs are buried nearly 3 feet deep in a light sick soil, but do not grow near the surface, as in the case of L. giganteum. It does not seem to be so vigorous as some Lilies, and is observed through the woods in small numbers.

In China it was found by the Rev. Davis on the Luoho Mountains, near Kiao-chow, and also by Mr. H. Huxley near the temple of Tien-tung, about 20 miles from Ningpo (see Brotine's 'Wanderings in China'). I am not certain that these plants are identical with the Japanese variety which is here figured. Indeed, from a drawing sent me by Mr. R. Rears, which represents a plant found by Mr. Huxley near Kiao-chow, I am inclined to think that the Chinese plant differs considerably from the Japanese; but as the existing materials is not sufficient...
It seems that this Lily was first introduced from China about the year 1855 by Mr. R. Fortune, who sent bulbs to Mr. Hooker, of Kew, with whom they remained. The plant, however, was not long neglected, and though it has been raised from seed by Mr. W. Masson and others in some quantity, and also imported from Japan in small numbers, I do not think it will ever become as popular a plant in our gardens as the Himalayan species, being apparently of a more delicate constitution and much inferior in beauty.

There was some correspondence on the subject of this Lily in the "Gardeners' Chronicle" for 1877, which tends to show that the variety first introduced by Mr. Fortune, and which, as I have said, probably came from China, was taller, more floriferous, and otherwise finer than those now in cultivation. There is also considerable difference in the arrangement of the leaves, which are not always arranged in a regular whorl, but are sometimes scattered.

As this plant produces its leaves very early in the spring, and they are much injured by frost, it is desirable to protect them with a hand-light, and care must be taken that the beautiful bronzed foliage is not injured by sun and wind.

Though it has been successfully grown by Mr. Loddiges, Mr. Hooker, and others, I have never myself been fortunate enough to flower the plant, and am indebted to Mr. J. J. Hooker for permission to figure one which flowered in the Royal Gardens at Kew in July 1877.

The capsule, which is the only one I have seen, was grown by Mr. Masson, of Oaklands Park, Weybridge, and though probably not fully developed, contained a few good seeds, and shows the peculiar shape very clearly.
LILIUM WASHINGTONIANUM.

THE WASHINGTON LILY.

L. Washingtonianum, Nutt. Proc. Calif. Acad. Sci. I. 11, 1857; Wood, Proc. Acad. Phil. 1868, 1. Coker, Gard. Chron. 1871, 287, and Journ. Linn. Soc. n. s. 3, 1872: Regel, Garten 0; Duchartre, Ec. 15, 1870, 99; Flore d'alban, 1901, 288. The Washington Lily was probably first brought to notice by Dr. Kerzea, of San Francisco, who exhibited specimens of it at a meeting of the Californian Academy of Sciences in 1854. The plant had previously been found by Jerre, who sent it to the Kew Herbarium, gathered in 1851 and described by Prof. A. Woon under the same name in 1868. It was again described by Dr. Kerzea in 1872, when Dr. Kerzea gave it the name of Lilium Washingtonianum; and it was not introduced into our gardens until recently, when Kerzea, the well-known botanical traveller, having been put on the scent by Henn Max Henn, sent him a consignment of bulbs from California, which arrived in 1869. Shortly after this it flowered in Mr. Letewin's garden, and was figured by Dr. Kerzea in the 'Gartenbau.' In all the localities in which the plant has been collected it has been found to occur in a soil of which the drainage was not perfect, and which when watered did not face to some point between east and south. The pale, loosely-scaled, ovate flowers on a single stem, vary in number from 1 to 20. The height of the stem, the number of whorls and the depth of 12 to 20 inches. The height of the stem, the number of whorls and the depth of the bulb, much has much according to soil, position, and the difficulty of cultivating the plant. The better varieties, when well established, will rank among the finest. In considering the best means of attaining this object we shall first describe the soil and climate of its native habitat.

Dr. Kerzea says in the 'Gartenbau,' January 2, 1874: 'It occurs in the Cuyamaca Mountain in San Diego county, between Santa Fe and Cahuenga, in western slope of the Sierra Nevada, south of 3800 and north of 6000 feet elevation, in Oregon to the Columbia river, and on the west-slopes north of San Francisco, especially in the eastern parts of Mendocino and Humboldt counties. In all the localities in which it occurs either on ridges, or on slightly shaded slopes of ridges having a porous loose soil resting on a gravelly subsoil. At no time have I met with a plant of this species in a soil of which the drainage was not perfect, or in which, when watered, did not face to some point between east and south. The plant, loosely-scaled, oval bulb is found at a depth of 12 to 20 inches. The height of the stem, the number of whorls and of flowers on a single stem, vary very much according to soil, position, and age of the bulb. Much has been said about the difficulty of cultitating this beautiful species. I willingly confess that I have also met with many reverses until I paid proper attention to its habits and habits. If the bulb be planted at a depth of from 6 to 12 inches in a loam, somewhat gravelly
although perfect drainage, there is no difficulty in obtaining satisfactory results. Although there is positively
no specimen evidence between the bulbs and plants collected either in the Sierras or on the coast-ranges, yet I found
that bulbs from the coast-ranges would always bloom more readily in San Francisco (in cool houses) than those
from the Sierras. The reason is obvious; but it would be interesting to know if the same holds good in other
places!"

Two things are evident from this account, viz. that the bulbs must be kept out of reach of the frost, and
also from being burnt by the sun. Though the heat of California both in summer and winter is (except at high
elevations) much greater than that of England, yet the depth of the soil lying over the bulbs would effectively
prevent it from ever becoming either too hot or too cold. So great a depth would be unnecessary in Europe; but
the drainage, whether in pots or in beds, must evidently be most carefully attended to, as the rainfall and
dampness of our climate is greater than at San Francisco.

I am indebted to Mrs. Hanson, of New York, who for many years has cultivated Lilies with great success,
for the following notes on the species—L. Washingtonianum is found in almost every county in California and
Oregon. The best variety that I have seen is from Jacksonville, Oregon, which had the bulbs and flowers very
large, sometimes pure white, but generally spotted with purple, and occasionally with a yellow band. The soil in
this part of the country is very rich, cool, and well-drained, which perhaps accounts for the hardness of the plant.
L. Washingtonianum, the flowers of which were upright and trumpet-shaped, with the scent of a cowslip. It bore on one spike 21 flowers. There is a
splendid variety, growing on the banks of Eel River, California, which has flowers of a light purple. All the
varieties thrive in a deep, rich, loose soil and dry bottom, and are much averse to frost. They grow best in
a frame filled with leaves and covered with a mat in winter. This way of protecting them will enable the bulbs
grow all the winter, but if the roots are not cut, the bulbs will also perish. I think the plant is well worth all the
trouble expended on it, though for common gardening it is worthless."

The structure of the bulb in this species is very peculiar, though under cultivation it has become
less so. It consists of a horizontal rhizome, covered on both sides by a quantity of fleshy scales, of a dirty white
colour. These scales are about 2-3 inches long, by half an inch wide, pointed at the top, and convex outside.
Their bases are attached to the rhizome in such a way that those on each side face each other, and are neither
slipping than vertical. The growth of new scales, instead of taking place in the heart of the bulb, as usual, is in
an erect position, and the scales gradually decay at the other end, so that the flower-stem is thrown up from the end
of the elongated mass. The roots proceed from the base of the bulbs, gradually dying away as new ones are
formed under the advancing rhizome. The growth of 3 or 5 years, however, is visible in a large bulb, which will
measure 6 or 8 inches in length by 3 or 4 in depth, and has a thickness of about 2 inches.

The variety of this plant which has been described by Mr. BAX, purpureum, differs from the plant
which I have figured, in the nearly erect position of its flowers, in its smaller size, and in other respects from the
typical variety. Prof. S. WATTS, of Harvard, proposes to separate it specifically under the name of
L. rubescens, and has doubtless some good reasons for doing so. As, however, I should be unable to say to which
species some of the plants I have seen ought to be referred, I prefer to keep them together, and will give a separate
description of this form in my last part.

The plant here figured, however, in the garden of Mrs. Hattem at South Kensington, in July, 1877; and
for permission to figure it I am indebted to that lady, who cultivated Lilies in what would seem a most unmanageable
situation, with so much skill and success, as her husband Mr. J. BARRATT, F.H.S., formerly showed in the
attainment of such objects.

The single flower represents the colour of the ordinary variety, which is much inferior in beauty to the one
here figured.
LILIUM WALlichIANum.

WALLICH’S LILY.


Description:

The plant is characterized by its tall, erect stem, which reaches a height of 4-6 feet. The leaves are lanceolate, slightly veined, and are arranged in a spiral order around the stem. The flowers are terminal, drooping, and solitary, or two or three from the same point. Each flower is surrounded by green bracts. The perianth is white, with segments 7-9 inches long, and the flower parts are extended into a long claw. The flower capsule is elongated, with a large, yellow stigma. The plant is hardy and can withstand both heat and cold.

Historical notes:

The species was first discovered by Robert William Wallis in Nepal in 1802, and was sent to Europe under the native name of Batima. It was later found on Sheopore, near Kathmandu, in 1820. Mason introduced it in 1849, and was illustrated in the 'Botanical Magazine' under the name of 'G. longiforum.' Sen, the botanist, was led to consider it a distinct species. It was introduced in a living state for the first time in 1874. The bulbs arrived in April, and by the 16th August, the plants were 4 feet high.

The bulb figures in the 'Botanical Magazine' is so unlike the bulb of this Lily, that I supposed it to have been inserted by mistake; but Dr. Wallis, from whose plate in the 'Tentamen' the root was copied, says:—"The base of the stem I have repeatedly found horizontal, creeping, and seamy, like that of a fern, without any remainder of a bulb, but marked with a number of vestiges of old stems." This peculiarity, which I can hardly doubt when we have it on such good authority as that of Dr. Wallis, has, as far as I know, not been observed in any other species of Lily, or by any other writer. The bulbs which I have examined are quite of the same type as those of other oriental Lilies; they may, however, be easily distinguished from any other by the scarious edges of the scales, which are closely pressed together, and pointed at the top.

Climate and habitat:

The best account we have of the native country of this Lily is given in a letter from a correspondent of Mr. Bann's, printed in the 'Garden' for January 24th, 1874. Writing from Masuri he says:—"L. Wallichianum flowers in August or September, more usually the latter. It is a hardy plant, and can stand both heat and cold. I find it growing at an elevation of 5500 feet at the open grassy hill, on a slope of 45°, not in the shelter of the forest, in a soil full of lime, clay, and vegetable mould. On account of the steep slope of the hillside, it is thoroughly free from surplus water, the temperature of the summer rain not being from 18° to 20°. From June to the end of September (which is our rainy season) it grows in a perfect deluge, and is often submerged in waist deep water together. From September to December it gradually dies down in a mild warmth temperature by day, with hourly frost at night in November. Little rain falls during these months. Sometimes there is but little snow in winter, with hard frost at other times the snow lies 3 feet deep, but this is unusual. The bulbs lie at from 6 to 8 inches depth, and are uninjured. The plant seldom or never produces seed, but is propagated by suckers or by bulblets from some part of a long root, so that the flowering plants are surrounded by numerous young ones of various ages."
Another correspondent writes—"L. Wallichianum in certainly a wonderful Lily. I have seen it in the
Sandnes 5 feet high."

From these accounts it is evident that, whatever may be the powers of enduring cold of this Lily, a very
considerable degree of summer heat and moisture is necessary for its growth; and for this reason I do not think it will ever
prove so easy to grow in England.

Just at the time when we have most heat in England we usually have least rain; and the consequence is
that L. Wallichianum grows so late and so weakly that it is cut down by frost just as it is beginning to show a
little vigour. Mr. Neeve, however, of Hull, has succeeded in keeping it for some years, and says, in the Notes
on Bulbs by Dr. Waller—"I am not a little surprised to see the allusion made to the native habitat of L.
Wallichianum. On this matter I am in a position to give an opinion, as it has been planted out in these gardens
for sixteen years, and flowers every year. It has never had any protection beyond a covering of about 6 inches
of light peaty soil. Although cultivated for so long it is very shy of increase, and I was very nearly lost it through
an attempt to divide what seemed a perfectly formed corm."

It is the opinion of Mr. Lovett that there are other and much finer forms of L. Wallichianum than the
one here figured, and it is described by Waller as having usually two or three flowers on a stem; but, as far
as I am aware, none of these now exist in Europe.

I am indebted to Dr. Waller for the plant here figured, which flowered in July 1876 at Colchester. It
agreed almost exactly with the figure in the "Botanical Magazine" in the slightly irregular position of the lower
petals. I believe it was grown in a greenhouse, and attained nearly 5 feet height.

A large number of bulbs were imported three or four years ago by Mr. Han, some of which have flowered
in England; but I have never seen or heard of any finer than the plant figured; and the majority of them have, I
believe, died away after the first winter, perished after a year or two.

L. Martegy, vol. 4, Roso in., 146, 24 pts.

L. maculatum, Pers. et Sarmi, Lempi, 1, p. 96.

L. convolutum, Ste Mochen, vol. 4, p. 68.

Though Liliurn avenaceum appears to be a very common plant on the coasts and islands of North-eastern Asia, our knowledge of its peculiarities is still somewhat deficient, and it was not until 1877 that I was able to procure a living plant of it for figuring. It was apparently discovered long ago by Palland, and afterwards gathered in Kamtschatka by Kertzer, Maximowicz, and other travellers, but was not recognized or described as a distinct species until Maximowicz brought it to Russia in 1864, and described it from a plant which flourished in the Botanic Garden of St. Petersburg.

This Lily has been commonly confused with another species (L. Hansoni), which I have already figured; but, without speaking of the great difference in the size, habit, and appearance of the plant, the structure of the bulb is so very different from that of L. Hansoni, as to make it impossible in separating them. It seems to resemble L. tenuifolium much more closely than L. Hansoni; and unless it grows much more luxuriantly in its native country than it has done in cultivation, I am at a loss to understand how it can ever have been confused with the latter.

From this plant, and one which was exhibited at a meeting of the Royal Horticultural Society about the same time, my Plate was taken, being copied from the plate in the "Gartenlaube" for 1860, which T have seen of this Lily, which, from their resemblance to the grain of the oat, which I have not seen of this Lily, which, from their resemblance to the grain of the oat, which, from their resemblance to the grain of the grain of the oat, which, from their resemblance to the grain of the oat, which, from their resemblance to the grain of the oat, which, from their resemblance to the grain of the oat, which, from their resemblance to the grain of the oat, which, from their resemblance to the grain of the oat, which, from their resemblance to the grain of the oat, which, from their resemblance to the grain of...
LILlUM MEDCEOLOIDES.

GRAY'S JAPAN LILY.


Culms 1-2 feet high, slender, tense, glabrous. Leaves either arranged in a single whorl or rarely in two whorls, with the lower on the upper part of the stem, oblanceolate, acute, 5-6 inches long, 2 inches wide, erect, glabrous, greenish. Flowers 1-3 at most, in an umbel, the slender peduncle 2-4 inches long, inclining horizontally. Perianth 1½-2½ lines long, entire, the divisions inserted at the base, not narrowed into a distinct stem, 1½ lines broad, reddish yellow with a few purple spots, not papillate or pubescent. Filaments 3-5 lines long, anders small, style longer than the sta-...
LILIUM CONCOLOR.

SALISBURY'S LILY.


Var. v. Regel, et supra.

Bulbils solitary. hills oblong-ovate, obtuse, truncate; sepals ovate, acuminate, incurved, ovate-petaloidea.

HAB. Japan.

Var. in monandria, Hoch. in Ind. Soc. Pet. 1810, p. 264; Contendens, f. 294 (1800) ; Nov. Mant. 1802, p. 121, var. inv. 

HAB. Danica et Maxim., China borealis (Munro), var. v. see above, in Past. Fl. Gard. ii. p. 119, t. 198; Van Houtte, Fl. des Serres p. 120.

Bulbils solitary. hills lenticular, ovate-obovate, pubescent.

HAB. Japan, etc.

Bulbils concolor. hills solitariis, Malme, in Herb. Pet. 1885, t. 885 (1870). (As synthetic name.)

Bulbils concolor. Hills ovato-lanceolate, acuminate, sepals ovato-obovate, ovate, obtusely angular, obtuse, with pointed tips.

HAB. Plant whose intricate synonymy I have endeavoured, with the help of Dr. Regel, to unravel, is to me if such were needed, of the extreme difficulty of deciding on the classification of Lilies.

Here we have several varieties of one plant differing considerably in habit, colour, and size, but not more so than in usual in the genus, and having flowers all of very similar appearance. But when we come to examine the bulbs, we find two very distinct types, and, were it not for the fact that, as far as my present knowledge extends, one of these types has not been found in a wild state, I should at once decide that it had as good a claim to specific distinction as L. columbianum has from L. canadense.

The first type, to which the first two varieties belong, has a small, solid, round bulb of ordinary shape, such as is shown on the left-hand side of the Plate. The second, however, produces what I may term a nest of bulbs, consisting of five or six of equal size joined together at their base, and, if separated, each capable of producing a similar nest during a year's growth.
No one at all resembling this is known to me among Hyacinths, and I can only say that I should be much surprised if this curious habit turns out to be the result of culture.

My own idea is that in some of the temperate regions of North-west Asia, perhaps the Corea, a plant exists possessing this peculiarity; and the plant, having been introduced into cultivation, has developed in China the variety called *shinohi*, and in Japan the varieties (differing only in colour) which are known as *natsubo* and *manjusa*.

If the plant is to be found at all, it is at the botanic gardens, of which I believe few are only a garden form, do not in estimation show any tendency to form roots, and indeed, in this country more frequently perish than reproduce themselves at all.

The plant appears to have been introduced to France by Mr. Ernest Glass, from China; and so at that time, we had little or no communication with North and Central China, the bulbs were probably from some Chinese garden. The variety *shinohi* was brought by Mr. Pearson from Shanghai, where he found it in a flower, but not in a wild state; and I have received, through the kindness of the late Mr. Stevenson, a box of bulbs of this variety direct from Shanghai.

The Siberian variety *pratense*, which is, in the opinion of Mr. Westcarr, the wild origin of *c. convallarius*, is abundant in North China, near Pekin, in Chinese Manchuria, in Korea, in the river Aron, on the Upper and Lower Amur, on the Sungari and Yalu rivers, and on the coast adjoining the northern frontier of Corea. It has not, so far as I can learn, been found wild anywhere in Japan, and the small number of bulbs which is exported from that country shows that it is not seen in gardens so abundant as some species.

In cultivation this lily is not likely ever to become well established, though it is said to improve in the meadow, it seems to require either more heat in summer or a certain condition which it cannot get in England. Sometimes it will grow and flower well for a year or two, and then the bulb; and as I am unable to think that, like *c. convallarius*, it is not a true perennial, but naturally perishes after setting freely.

From a horticultural point of view there is not much to choose between the different varieties. The Chinese form is perhaps the largest and most showy; but even that is not a very permanent plant; and the Japanese variety I have never been able to keep over a year or two, though in Holland and Belgium it sometimes grows lovely. According to Mr. Livingston's experiment, the seeds of the different varieties of this species germinate quickly (in from four to six weeks), and produce flowered bulbs in the third year.

My Plate was drawn from a fine plant of the variety *pratense*, received from Russia, which flowered at Kew on July 1756. Fig. 1 is a plant of the variety *shinohi*, from Shanghai, showing the single stems and clustered leaves. Fig. 3 is a flower of the Japanese variety, and a bulb of the same, from my own garden.
LILUM OXYPETALUM.

ROYLES LILY.


*L. nanum*, Klotsch, Reise Wald 55.

*Balbus elongatus*, squamis paucis, lanus, teres, viridis, glaber, pillo. Folia 5-30, lanceolata, infra spars, 2-5 pol. a horizontale, late infundibuliforme, 15-12 dimidio integro, in parte, extus barbato. Stamina trientis breviora; antheris purpureis, Ovarii 5-8 longi, erecti, partie interioribus, parte exterioribus; ovulis indiis glabros, integris, ovariorum custodia, ovulis, 5-8 longis, erectis, integris, ovulis.

*Hab.* Himalaya to 12500 feet (Ronis, Sarraceni, Horn). Bulbs elongated, with few narrow, pointed white scales, about 1 inch long. Stems slender, glabrous, 1-1} foot high. Leaves 15-60, lanceolate, scattered, alternate or somewhat crowded near the top. Flowers nearly solitary, sometimes 2 or 3 in number; the segments spreading from the base and twisting at the middle of 1 inch long, by 8 or 9 feet broad, purple, the outer spotted at the base light with darker. Stamens and a third shorter than the previous, narrow, slender. Ovary oblong, 5-6 long; style somewhat divided. Capsules 9-12 long, oblong, lighter.

This pretty little Lily was apparently first discovered by Dr. Hooker at Taranda, in Kumaon, in the North-West Himalayas. It was also found by General Stachy in 1852, and flowered in June 1853 at Kew. The drawing which was then made by Mr. Berg and published in the Botanical Magazine, plate 4732, is here reproduced.

It was introduced to England by Messrs. Strachey and Waterhouse in 1852, and flowered in June 1853 at Kew Gardens. The drawing which was then made by Mr. Berg and published in the Botanical Magazine, plate 4732, is here reproduced.

Lilium triptolos, which was gathered by Dr. Hooker, who accompanied Prince Wladimir of Russia during his Himalayan travels, appears to be the same plant. The type specimen (which I have examined in the Berlin Horticulture) only differs from my figure in having the upper leaves more crowded, and occasionally in the presence of 2 or 3 flowers.

L. nanum of Klotsch (which I have seen in the same herbarium) has the appearance of a variable specimen of the same species, but the specimens are not sufficient to make this certain.

The habitat and size of this plant, which is the smallest Lily yet known, give it more the appearance of a *Fritillaria*; but its peculiar long slender habit shows at once that its affinity is rather with the *Lilium*. 
LILIUM NEPALENSE.

THE NEPALESE LILY.


Found by Sir H. Watson in the mountains of Nepal, in July, and on the mountain of Gomain-than, near Kathmandu, Nepal. It appears to be confined to the mountains of Nepal, at an elevation of 4000-5000 feet, and, judging from the plate, is a distinct and well-marked species, differing from any of the nearly allied plants of the Stocks group. It appears to have been introduced to England in 1855, the following note from the 'Gardener's Chronicle' for that year, p. 564, being the only notice I can find of its having been received in Europe:—

"A small, single-flowered bulb, with alternate lanceolate leaves. Flowers nodding, with revolute, smooth segments as long as the tube. Stamens shorter than the flower, with deep-orange-coloured pollen. According to Sir H. Watson, the flowers are dull yellow; in the specimen before us they are greenish, much spotted with purple inside. It is from a very small bulb, presented to the Horticultural Society by the East-India Company, which opened on the 10th of July, that this note has been made. The Indian drawings represent the flower to be about an inch long, which corresponds with Sir H. Watson's account and with our wild specimens. It never seems to grow more than 2 to 3 feet high, and has no odor worth mentioning."

A few bulbs, under the name of L. nepalense, were introduced two years ago by Mr. Burman and one of these is still alive in my greenhouse. As, however, it has not yet flowered, I am unable to be sure of its identity, and have not figured it.

I am inclined to think that Mr. Burman has drawn his note on this species in the 'Gardener's Chronicle' with some other plant in view; but as I believe that the specimen in Watson's herbarium is the only one which can be depended on, they have been copied by Mr. Penn for this work.
LILIUM MARITIMUM.

THE COAST-LILY.


Brief description: bulbs on or near the coast; flowers, 1½ to 2½ inches long, sepals and petals of a yellowish-green, slightly spotted; upper petal, with a long, tubular base, an ovate, yellow, spotted, yellowish petal, and a yellow column; flower, 2½ to 3½ inches long, 6 petals, 6 stamens, 6 filaments, 6 styles, 6 filaments, 6 stigmas, 6 ovaries, 6 seeds, 6 seeds; rootstock, a cylindrical, hard, woody stem, 1 to 2 inches long; leaves, 1 to 2 inches long, 1 to 2 inches wide, basal, oval, or elliptical, 1 to 2 inches long, 1 to 2 inches wide; bulb, 1 to 2 inches long, 1 to 2 inches wide, 1 to 2 inches long, 1 to 2 inches wide; flower, 1 to 2 inches long, 1 to 2 inches wide; fruit, 1 to 2 inches long, 1 to 2 inches wide; seed, 1 to 2 inches long, 1 to 2 inches wide.

This Lily has been recently described by Mr. Keenan, of San Francisco, and though it has not yet been imported into Europe, it is now in the Royal Horticultural Society, South Kensington, and in the collection of Mr. Bearse, the well-known botanical collector, in California. It was collected by Mr. Bearse near the coast, between the Elk and American rivers, about 200 miles north of San Francisco, and is thought to be a local variety of L. maritimum, of which it is very possibly a distinct species.
LILIAM PARRYI.

PARRY'S LILY.


Bulbs — bulbils on bracts 1-2 cm. broad, 4-5 cm. long, brown, tufted, pachycaul, 2-8 per bulb, 1 cm. in diam. Racemes 2, 1 in each leaf axil, none inferior bracteoles or ovaries. Flowers 2, 1 in each leaf axil, minute, bracteoles sessile, white, petals 6, stamens 6, filaments short, anthers 6, oblong-ovate, yellow. Perianth segments 2-3 inches long, 1-2 mm. wide, 1/2 inch shorter than the perianth, 6-8 in 1 flower. Petals nearly 1 inch long. Ovary 1-2 cm. long, 1/2 inch wide, slightly spreading from the base, rounded at the point, style and stigma equal in length, about half an inch shorter than the perianth; stamens 6, free long. Ovaries numerous, oblong, 1 cm. long by 1/2 inch wide.

AM indebted to Mr. C. S. Sarvis and to Dr. Henry Wats., of Harvard University, Cambridge, U. S. A., for the description of this Lily.

It was described by Dr. Wats. from specimens collected by Dr. Parry early in July 1876 in a marsh in San Gorgonio Pass, San Bernardino County, South California.

It appears to belong to the type of L. Washingtonianum more than to any other Lily; though I am not sure whether either of these plants can properly be included with L. Longiflorum Sc. in the Formosa section.

The bulbs, at least as I can judge from the excellent drawing, seem to be of a type intermediate between L. Washingtonianum and L. Parryi, though the affinity of the plant is certainly with the former species. It may be that its bulbs, from growing in a marshy situation, have become somewhat modified in form.

I am not aware that any variety of L. Washingtonianum has been found so far south as the San-Bernardino Mountains, which lie about 150 miles N. of the borders of the desert country which lies between Arizona and New Mexico.

I am indebted to Mr. Henry Wats. for the following extract from Dr. Parry's account of the plant.

In one of my last botanical excursions in the vicinity of San Bernardino, in July 1876, I accepted an invitation to visit the intelligent brothers J. E. and J. M. Hill in their mountain retreat near San-Gorgonio Pass. Leaving the broad and picturesque basin of the Santa-Anna valley near the emergence of the stream from the secular mountain-wall of the San-Bernardino range, our route, after crossing Mill Creek, hugged the southern border of the Upper-Yukina valley; thence, by a more direct and eastern course, we reached an elevated bench-scaned with pine and oak groves overlooking the broad sweep of the San-Gorgonio Pass, now traversed by the eastern extension of the Southern-Ohio Railroad. In the midst of these mountains stands the Yeuxes House, located on a plateau, the elevation of over 4000 feet, giving a sufficiently cold and moist climate, while the adjoining mountain-slopes afford an extensive summer pasture-range; long after the herbage of the lowlands has dried up.

In scattered groves of Pines (Conifers) the ground was strewn with the massive cones of this peculiar species, its three scales armed with formidable hooked spines. Many of the cones were fully 6 inches in diameter, with a length of 8 inches.

The few perennial water-courses here met with are mostly confined within deep and inaccessible ravines; but some frequently carry springs rising out from beneath deep layers of porous strata and spread out into buggy streams, generally choked up with rank Willow and Alder growths, and occasionally rounded into small meadows of coarse grass and sedges.
On all t p и al display ог Cali сеп shrubbery, including the leath-like Althea (which, under the name of "colchicum", is largely used for fill), the Holly-leaved Cherry (Prunus ilicifolia) exhibiting a strong color of bitter almonds, the Heteromeles arbutifolia with glossy terminal leaves, and a prevalent form of "California Lilac" (Ceanothus serrulatus) with thick leafy foliage. The dull green hue which everywhere characterizes the moorish growth, is at this time of year partly relieved by brilliant scarlet festoons of Pentstemon corvalis trailing over adjoining bushes, or the less showy blossoms of Pentstemon tessmannii.

But what soon attracted more exclusive attention was a conspicuous yellow Lily growing splendidly on the heathy ground adjoining Muscat, Rice's house, and sharing with the potato-patch the care and attention of the undesputed possessors of the soil. Though not so showy as some other members of the Lily family in this region, there is a grace displayed in its large drooping flowers surmounting a slender stem beset with narrow scattered leaves, which are occasionally crowded at the base into a distinct whorl.

The Lily in question has not yet been introduced into Europe, but is in cultivation in the Botanic Garden of Harvard University.

The careful drawing from which Mr. Ferris has engraved the Plate was made by Mr. Otte Gnorx, of Rock-Island Arsenal, Illinois, from dried specimens selected by Dr. Parry, and was pronounced by that gentleman to be a true and characteristic likeness of the living plant.
LILIUM PARDALINUM.

THE CALIFORNIAN LILY.

In my previous account of this Lily which accompanied the Plate of the species called californicum I said that the varieties were numerous, but, as far as I could judge from the examination of a very large number of which I have observed annually for four seasons in my garden, I believe them all to be forms of the species. The synonymy of the plant, however, is very confused; and though I have endeavoured to clear it up as much as possible, I am not sure whether some of the synonyms quoted under this species may not belong to L. Humboldti.

Mr. Stanford Watson, of Harvard University, who has recently received the Plate of the Pacific States, writes as follows, in a letter dated April 29, 1897:—"I suspect that there is some confusion with regard to L. pardalinum and its varieties. My specimens are more slender than I should wish; but I have specimens from Ker a son himself, both of L. pardalinum and its var. angustifolium. His specimen is from Alameda County, and is the stout large-flowered form with many-leaved verticils. The variety has narrower scattered leaves, and is like Humboldt's var. 2903 (L. canadense, var. spathulatum, Baker), which I suppose must also be L. angustifolium, but to some hands said to come from Utah, and in my opinion a good variety as compared with what I take to be the typical form. I do not know what your californicum is, as I have not access to Mr. Kears's Plate. My plant, which Baker refers to it, has more than I could wish; but I have specimens from the garden. I am not sure whether this L. californicum covers forms of L. Humboldti (which ranges as far north as Yuba Co. at least), as well as perhaps the typical pardalinum."

In a later letter dated May 6th, and written after seeing the Plate in the fourth part of this work, Mr. Watson says:—"It seems that my conjectures respecting L. pardalinum were, at least in part, correct. Your figure represents exactly what I received from Dr. Ker a son as the typical form; so that there need be, I think, nothing more said of a var. californicum."

After taking into consideration all the facts I have been able to gather respecting this species, I think the best arrangement for its varieties will be as follows:

1. L. pardalinum, Kell, = var. californicum, Lindl., = L. Robinsoni hort., figured in part 4 of this work, the Plate lettered incorrectly as Liliun californicum.

This, which I take to be the typical form, forms easily distinguished from the rest by the size and colour of its flowers, which approach those of L. Humboldti in dimensions and brilliancy. This form never, in my experience, bears more than five flowers, usually only two or three. The pedicels usually spring from one point on the stem, as shown in the figure, and do not form a raceme, as usual in the other varieties. This form came from seed in my own garden; but I cannot say whether it always does so. I believe it was first introduced from California to this country by Mr. Robinson of the 'Garden,' who has done more to make Lilies and other hardy plants popular than any other writer.

Hab. Alameda Co., California.

2. L. pardalinum, var. angustifolium, Kell, as figured on the present Plate.

This form, which is the commonest in gardens, is distinguished by numerous flowers of moderate size, lanceolate leaves about 5 inches long by one broad, usually in whorls of eight to twelve; but the whorls are often broken and the leaves scattered.

3. L. pardalinum, var. occidentale, hort. Ware.

A form near the last, but with narrower, more pointed leaves, ten to fifteen in a whorl; the pedicels divided into two, longer, and more open than in the last. It was raised from seed in Mr. Ware's nursery at Eddonham, but a plant from Robinson Co., Oregon, which I received from Mr. Hanover, was exactly similar.


This form resembles the last too much to be distinguished by the number of leaves being almost permanently double, each whorl containing about 19 or 20 leaves in two series. The plant is, in England, from
Meen to twenty days later in flower than the others. It has been in cultivation many years in the well-known garden of the Rev. H. Kelman, at Hutton, under the name of L. Michaux— but has nothing to do with L. coronarium, of which L. M. pressed is a synonym. It was, I believe, introduced many years ago by Huxley to the Royal Horticultural Society’s garden.

6. L. peruvianum, var. multiformis, Baker.

This form, which is, I think, usually called multiformis, but is not the multiformis of Teuny, is distinguished by its short, blunt, spathulate leaves, which are constantly of a paler colour than those of the other varieties. It is very distinct, producing from twenty to thirty or more flowers on a stem from 6 to 8 feet high; but the flowers are individually smaller and paler than in the other varieties. I first received it in 1875 from Mr. J. Baker, of New York, and I believe it was first introduced, together with other varieties of the same plant, by Mr. W. Benson. The first, second, and fifth of these forms certainly appear to be distinct and constant varieties, and the third and fourth have been so far four seasons in my garden; but I should not be surprised to find that their distinctive characters disappeared under changed conditions; and, perhaps, even now they could not be exactly identified with plants in a state of nature.

The habitat of this plant is the coast-range of California and Oregon, from about 1000 to 8000 feet elevation, where it grows in marshy valleys and wet places near springs. It is found growing in great abundance in certain localities, and frequently attains an elevation of 7 or 8 feet. I am not aware that any of the forms of this Lily have been found in the Rocky Mountains, or in Southern California. The habitat given for L. fasciculata, in Utah, is, I think, very doubtful; and Mr. Benson himself was unable to remember having found any plant of this nature in Utah.

The cultivation of all these forms is so easy, their multiplication so good, and their increase so rapid, that I can confidently recommend them to all. Unlike so many Lilies, which year by year get weaker and fewer, and sometimes, notwithstanding all the pains which has been taken to provide them with comforted quarters, this species is a really good garden plant, requiring only tolerably deep moist soil and protection from wind to develop its full beauty.

The bulbs, when established, produce usually from three to five flowering plants from each old one, sometimes a crowd of fine stems being spring up, and a great abundance of flowers to appear. The seed also, which is produced in favourable seasons, grows much more quickly and easily than in the case with many Lilies, and produces flowering plants in about four years. I have found that it is better to divide the masses of bulbs formed by the varieties of this Lily about once in three years, as they crowd each other so much by their rapid increase that the stems become weak from want of room.

The plant from which my figure was drawn flowered in my garden in July 1870.