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THE MEDICINAL AND POISONOUS FERNS OF INDIA.

BY

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The Filices are a very large and important family of plants consisting of about 170 genera and upwards of 3,500 species. They are distributed all over the globe, although they find their headquarters in tropical America and tropical Asia. Even the Arctic zone is not excluded. They are found at all elevations, from 10,000 to 12,000 feet in the Tropics, down to the sea level.

The medicinal and poisonous ferns of the world belong to 44 genera:—Acrostichum (Tropical America); Actiniopteris (North Africa, Mascarene Islands, Persia, Afghanistan, India, Ceylon); Adiantum (Cosmopolitan, especially tropical America); Alsophila (South Australia); Aspidium (Tropical regions); Asplenium (Cosmopolitan); Athyrium (Cosmopolitan); Balantium (Cape Verde, Canary Islands, Madeira, Azores); Blechnum (Tropical America); Botrychium (Cosmopolitan); Ceratopteris (Tropical countries); Cheilanthes (Tropical and temperate regions, xerophytic); Cibotium (Tropical America, Polynesia, Asia); Cyclophorus (Tropical countries); Cystopteris (Temperate regions); Davallia (South Spain, Portugal, Azores, Madeira, Canary Islands, Cape Verde); Dicksonia (Australia); Drymoglossum (Tropical regions); Drynaria (Palaeo-tropics); Dryopteris (Northern temperate regions); Gleichenia (Tropical and subtropical regions); Gymnogramme (Central America; xerophytic); Helminthostachys (Ceylon, Himalaya to Queensland); Hemidictyum (India, Western Asia, Europe, North-West Africa); Lomaria (India, Ceylon, Philippine Islands, Fiji, New Zealand, South Australia, Tasmania); Lygodium (Tropical Asia, Eastern Asia); Marsilia (Europe and subtropical regions); Mertensia (Tropical and subtropical countries); Mohria (East Africa, Madagascar); Nephrodium (Northern temperate regions); Nephrolepis (Tropical and subtropical regions); Nothoclaena (Subtropical regions, Mediterranean); Onoclea (East Asia, North America); Ophioglossum (Tropical and temperate regions); Osmunda (Temperate and tropical countries); Pellaea (Subtropical regions); Pleopeltis (Tropical and subtropical regions); Polypodium (Tropical and temperate regions); Polystichum (Moist temperate regions); Pteridium (Cosmopolitan); Pteris (Cosmopolitan); Scolopendrium (Europe, Asia); Stenoloma (India, Ceylon, Malaya, China, Japan, Polynesia, East African Islands); Woodwardia (Tropical and subtropical regions).

The medicinal and poisonous ferns of India belong to the following 24 genera:—Actiniopteris, Adiantum, Aspidium, Asplenium, Athyrium, Blechnum, Botrychium, Ceratopteris, Cheilanthes, Cibotium, Cystopteris, Drymoglossum, Drynaria, Dryopteris, Gleichenia, Helminthostachys, Hemidictyum, Lygodium,

OPHIOGLOSSUM, OSMUNDA, PELLAEA, PLEOPELTIS, PTERIS, STENOLOMA.

I. *Gleicheniaceae*—Sori dorsal, without indusium, composed of a few sporangia having a transverse or obliquely transverse complete ring and opening vertically.
Caudex creeping; stipes forked; segments small, almost round or pectinate ... ... GLEICHENIA.

II. *Dicksonieae*—Sori globose; indusium inferior subglobose, free, closed, at length bursting irregularly, more frequently cup-shaped, entire or with 2 lips.
Indusium apical on a vein 2-valved ... ... CIBOTIUM.

III. *Davallieae*—Indusium squamiform, suborbicular or tubular, open at the apex.
a. Indusium apical, compound, sub-orbicular, only open at the top ... ... STENOLOMA.
b. Indusium medial on a vein membranaceous, hood-like ... ... CYSTOPTERIS.

IV. *Pteridcae*—Indusium oblong or linear, formed of the more or less changed and reflexed margin of the frond, opening inwardly.
a. Indusium globose to linear, usually many and distinct, sometimes confluent and continuous bearing the capsules on its under side; veins free ... ... ADIANTUM.
b. Indusium rounded and distinct, or more or less confluent but not continuous; capsules on the frond ... ... CHEILANTHES.
c. Indusium quite continuous, sori at first dot-like, but soon running into a line ... ... PELLAEA.
d. Indusium quite continuous; sori linear continuous, occupying a slender filiform receptacle in the axis of the indusium; veins free ... ... PTERIS.
e. As in *Pteris*, but veins all anastomosing without free included veinlets ... ... DRYOPTERIS.
f. Anomalous ... ... CERATOPTERIS.

V. *Blechneae*—Indusium linear or oblong parallel with the midrib and opening towards it, not near the margin.
Indusium membranaceous, distinct from the margin of the frond, parallel with and usually contiguous to the midrib, veins free ... ... BLECHNUM.

VI. *Asplenieae*—Indusium linear or oblong or horseshoe-shaped, opening towards the midrib, sometimes double; sori attached to the veins.
a. Indusium linear or oblong, single; vein free ... ASPLENIUM.
b. Indusium linear or oblong, more or less curved. ATHYRIUM.
c. Indusium linear or oblong; veins anastomosing obliquely only towards margin of frond ... HEMIDICTYUM.
d. Indusium linear elongated, submarginal, fronds fan-like ... ... ACTINIOPTERIS.

VII. *Aspidieae*—Indusium superior, elliptical, subglobose or reniform, fixed either by the centre or a sinus.
Indusium peltate, orbicular or reniform; veins copiously anastomosing with free included veinlets ... ASPIDIUM.

VIII. *Polypodieae*—Sori on the back of the lobes, round or rarely somewhat oblong.
a. Fronds with the base oak-leaf-like or with separate sterile oak-leaf-like small fronds ... ... DRYNARIA.

b. Fronds various; veins copiously anastomosing with free included veinlets ... ... PLEOPELTIS.

IX. *Grammitideae*—Sori on the back of the lobes more than twice as long as broad, usually linear.
Sori in a continuous linear, or interrupted central or submarginal line, veins reticulated, fronds simple and dimorphous ... ... DRYMOGLOSSUM.

X. *Osmundaceae*—Capsules 2-valved, opening across the apex, furnished with a short horizontal ring ... OSMUNDA.

XI. *Schizaeaceae*—Capsules 2-valved, opening down the side crowned by a complete operculiform ring.
Capsule solitary in the axils of large imbricating clasping involucres. Scandent ... ... LYGODIUM.

XII. *Ophioglossaccae*—Capsules deeply 2-valved, opening down the side nearly to the base without a ring.
a. Capsules sessile in 2 rows on a narrow close spike OPHIOGLOSSUM.
b. Capsules in small crested clusters forming a loose spike ... ... HELMINTHOSTACHYS.
c. Capsules in 2 rows on the face of spikes which form a compound panicle ... ... BOTRYCHIUM.

The parts used medicinally are the fronds and the rhizomes. The former are often aromatic, and they are commonly given in infusion for their mucilaginous, pectoral, and astringent properties. On the other hand, the rhizomes usually contain a bitter astringent principle together with a fixed oil which is poisonous to worms.

The common Male Fern, or Shield Fern, which has been known from the times of Theophrastus and Dioscorides as a specific remedy for intestinal worms, particularly the tape worm, is official in all pharmacopoeias. The true Maidenhair Fern is official in Belgium, Portugal, Switzerland, and Turkey. The Canadian Maidenhair and the common Hart's Tongue are recognized by the French Codex, and several species of Polypody Ferns are still retained in the Austrian pharmacopoeia.

ACTINIOPTERIS.

This genus consists of a single species, ***A. dichotoma*** Bedd., which resembles a miniature palm. It is found throughout India, epecially the Peninsula, in dry rocky places, below 4,000 ft. From Ceylon to the Mascarene Islands, Maarlisberg, Zambesiland, Angola, Upper Egypt, Abyssinia, Socotra, Mount Sinai, Arabia, Persia, Afghanistan.

It is used medicinally as a worm remedy, and as an astringent to arrest hemorrhage.

Bombay: Bhuitad, Mapursika, Mayursikha—; *English*: Peacock's Tail—; *North-Western Provinces*: Morpach, Morpankhi—; *Sanskrit*: Mayurshikha—.

ADIANTUM.

This cosmopolitan genus numbers about 190 species, mostly tropical American.

Tradition has attributed to various species of this genus of ferns valuable properties in chronic pulmonic catarrhs.

The following species are used medicinally in Europe, Indo-China, Mexico—*A. capillus-veneris* Linn.—; in China—*A. capillus-veneris* Linn., *A. flabellulatum* Linn., *A. monochlamys* Eat.—; in North America—*A. capillus-veneris* Linn., *A. pedatum* Linn.—; in Brazil—*A. cuneatum* Langsd. and Fisch., *A. radiatum* Linn., *A. subcordatum* Sw., *A. tenerum* Sw.—; in South Africa and La Reunion—*A. capillus-veneris* Linn., *A. aethiopicum* Linn.—.

The fronds of *A. pedatum* Linn. are officinal in France; those of *A. capillus-veneris* Linn. in Belgium, Portugal, Switzerland, Turkey.

Nine therapeutically active species may be found growing in India.

I. Frond simply pinnate, rachis rooting at the apex.		
a. Pinnae half-moon shaped, distinctly stalked, $\frac{3}{4}$-$\frac{1}{2}$ inch by $1\frac{1}{2}$-1 inch. Texture herbaceous	1.	*A. lunulatum.*
b. Pinnae wedge-shaped at the base, nearly sessile, $\frac{1}{2}$-$\frac{3}{4}$ inch by $\frac{1}{4}$ inch. Texture leathery ...	2.	*A. caudatum.*
II. Frond at least bipinnate; segments fan-shaped with the stalk near the centre; sori oblong or obversely kidney-shaped.		
a. Pinnules firm, membranaceous-chartaceous, glabrous, scarcely ever or but slightly 2-3 lobed, fertile lobes with 2, rarely 3 notches, each notch bearing a rather large sorus at the bottom	3.	*A. venustum.*
b. Sori roundish or transversely oblong.		
i. Pinnules distinctly wedge-shaped at the base. Sori in shallow depressions of the lobes.		
† Pinnules deciduous	4.	*A. tenerum.*
†† Pinnules not deciduous	5.	*A. capillus-veneris.*
ii. Pinnules roundish, being straight, almost wedge-shaped or rounded at the base. Sori in deep hollows of the lobes	6.	*A. aethiopicum.*
c. Sori obversely kidney-shaped in deep round hollows of the lobes	7.	*A. cuneatum.*
III. Frond dichotomous	8.	*A. pedatum.*
IV. Frond flabellate	9.	*A. flabellulatum.*

1. **Adiantum lunulatum** Burm. This very graceful fern occurs throughout Northern India in moist places; in South India it is very general on the western side in the plains and lower slopes of the hills. It is found in Burma, Ceylon, the Malay Peninsula, Perak, Cochin-China, China, Hongkong, Polynesia, Tropical Australia. It extends to Cape Verde Isles, Angola, Guinea, Zambesiland, Madagascar. In Tropical America it grows from Mexico southward to the Organ Mountains in Brazil.

Ayurvedists describe the plant as pungent, cooling, alterative, alexiteric, and indigestible. They consider it useful in dysentery, diseases of the blood, ulcers, erysipelas, burning sensations, and epileptic fits. They recommend the rhizome for strangury and for fever due to elephantiasis.

In general the fronds are considered to be deobstruent, diuretic, emmenagogue, resolvent and pectoral. As a pectoral they are used in pulmonary catarrh. They are also demulcent

and mildly stimulant. As a discutient their plaster is a useful application on chronic gouty and other swellings. Burnt with oil they are used as an application for itch.

In Gujerat the plant is extensively used in the treatment of children for febrile affections. The leaves are rubbed with water and given with sugar. The herbaceous parts pounded with ochre are applied topically for erysipelatous inflammations.

Arabic: Shirulajibala—; *Bengal*: Goyalelata, Kalijhant—; *Bombay*: Hansraj, Hansaraj, Kombada, Mubarak, Ratakombada, Rajahans—; *Canarese*: Navalad—; *Gujerati*: Hanspadi, Hansraj, Mubarkha, Mubarkhinipalo—; *Hindi*: Hansapadi, Hansapagi, Kalijhamp, Kalijhant, Paresiyavasan—; *Ilocano*: Dalipaco—; *Marathi*: Ghodkhuri, Hansari, Kamsaraj, Rajhans—; *Persian*: Parasiyavashana—; *Philippines*: Culantrillo—; *Porebunder*: Hansraj, Kalohansraj—; *Sanskrit*: Brahmadani, Chitrapada, Dharttarashtrapadi, Ghritamandalika, Godhangri, Godhapadika, Hansaghri, Hansapadi, Hansavati, Karnati, Kiramata, Kirapadika, Kitamari, Madhusrava, Padangi, Raktapadi, Sancharini, Shitangi, Sutapadika, Suvuka, Tamrapadi, Tridala, Tripadi, Triphala, Vikranta, Vishvagranthi—; *Tagalog*: Caicai, Gayomanmanoc, Lamotlamotan, Lomotlomotan—.

2. **Adiantum caudatum** Linn. occurs throughout India, Ceylon, and the Malay Peninsula in the plains and lower slopes of the hills. It extends to Java, Borneo, the Philippine Islands, China, and Arabia Felix. It is also found in the Cape Verde Islands, the banks of the Niger, Angola, Zambesiland, the Cape Colony, and Mauritius.

The fronds are used as a cure for cough and fever. They are also employed externally as a remedy for skin diseases.

Cutch: Mayurshika—; *Punjab*: Adhsaritakajhari, Gunkiri—; *Sanskrit*: Mayurashikha—.

3. **Adiantum venustum** Don. is a common Himalayan fern distributed from Afghanistan, through Kashmir and the Punjab, to Nepal. Blanford says this is 'one of the commonest and most abundant ferns of Simla, covering banks and sloping ground in shady places, and ranging from 4,500 ft. up to the top of Hattu at 10,500 ft.' It grows in the soil in forest, often forming for miles the most characteristic under-vegetation.

This maidenhair is a famous Yunani drug, and at one time it used to be exported in cartloads from Jaunsar, along the cart-road to Saharanpur, for some medicinal purpose. Mahommedan writers describe the fronds of the plant as slightly bitter, resolvent, deobstruent, expectorant, diuretic, emmenagogue, purgative, aphrodisiac, and alexipharmic. They consider them useful in biliousness, phlegmatic humours, inflammations, diseases of the chest, colds, headache, tumours, ophthalmia, and hydrophobia. They prepare an oil which they apply to piles, tuberculous glands, and wounds, and also 'to bring out a thorn which has penetrated into the body'. The leaves made into a plaster are applied topically to chronic tumours of various kinds.

There is no doubt as to this fern possessing astringent and aromatic properties, and being emetic in large doses. It is a tonic, febrifuge, and expectorant. The plant is very useful as a mild tonic, especially during convalescence from fevers. A vapour bath

medicated by a decoction from the leaves of this fern is regarded as useful in fever.

In Chamba the plant is pounded and applied to bruises.

It is this fern which supplies in the Punjab most of the *hansraj* which is commonly administered as an anodyne in bronchitis, and is considered diuretic and emmenagogue.

As an ointment it is used for the prevention of hair from falling. The ashes of the plant mixed with olive oil and vinegar are used to make the hair grow upon the bald patches produced by ringworm of the scalp.

The plant is one of the ingredients in Sushruta's Vidaryadi-gana recommended for the treatment of scorpion sting. On the other hand Yogaratnakara, Nighantaratnakara, and Brihannighantaratnakara advise macerating the rhizome and putting the juice and pulp into the ear of the patient. But from their experimental work with mice Caius and Mhaskar have concluded that no part of the plant is an antidote to scorpion venom.

Arabic: Kuzburatelbir, Masifelaswad, Sakelasward, Shaerelfual, Shaereljibal, Shiruljibal, Shiruljinn—; *Bombay*: Mubarak—; *Hindi*: Hansraj, Kalijhanp, Kalijhant—; *Persian*: Hansraj, Paresiyawashan, Parsiawashan—; *Sanskrit*: Hansapadi—; *Tamil*: Mayirsikki—; *Urdu*: Mobarkha, Parsia ushan—.

4. **Adiantum tenerum** Sw. is found in Mexico and the West Indian Islands, southwards to Juan Fernandez and Peru. One solitary specimen was collected in Sion Wood, Bombay Island, by Blatter and d'Almeida, and regarded as an escape from cultivation.

The plant is demulcent, expectorant, and sudorific. It is much used in Brazil in bronchial and catarrhal affections.

5. **Adiantum capillus-veneris** Linn. appears to be found all over India, where circumstances are favourable; shade and permanent moisture being essentials. It occurs chiefly in the Western Himalaya, ascending to an altitude of 8,000 ft.; but found also far to the east in the valley of Manipur, extending to the mountains of the Burma-Manipur frontier and to Chittagong. It is common in the Punjab, descending even to the plains, where it is found in wells and damp places. It is also quite common in South India, in the Bombay and Madras Presidencies, particularly on the west side up to 5,000 ft. It is rare in Ceylon, but extends to Polynesia, Japan, and South-Eastern China. Through Afghanistan and Baluchistan it finds its way to Arabia, Syria, Siberia, the Caucasus, Central and Southern Europe, South-West England, Isle of Man, and Ireland. It is also met with in the Canary Islands and in many parts of the African Continent, both North and South. It extends from Florida, southward to Venezuela and the Amazon Valley.

In the Punjab, the leaves along with pepper, are administered as a febrifuge; and in South India, when prepared with honey, they are used in catarrhal affections.

The herb is mucilaginous, pectoral, and expectorant; and is used as a popular cough medicine throughout most parts of

Europe. It has also been used to stimulate menstrual discharges. It is given in the form of infusion, sweetened with sugar or honey.

In France large quantities are employed in the preparation of *Sirop de Capillaire*, which is given as a favourite medicine in all coughs, throat affections, and bronchial disorders. It is flavoured with orange flowers, and acts as a demulcent with slightly stimulating effects. One part of the plant is gently boiled with ten parts of water, and with nineteen parts of white sugar. Dr. Johnson, says Boswell, used to put *Capillaire* into his port wine. Sir John Hill used to say that the fine syrup made in France from that Fern is not by any means to be thought a trifle, because barley water, sweetened with this, is one of the very best remedies for a violent cold.

'The True Maidenhair,' says Gerard, 'maketh the hair of the head and beard to grow that is fallen and pulled off.'

The Basutos smoke the leaf for head and chest colds.

In Southern California the plant is much used as an astringent, expectorant, and emmenagogue.

At Colomas, in Mexico, the leaf is used as a tea to relieve colic; but at Colothan it is taken as a tea for the absence or abnormal stoppage of the menses.

The rhizome is the part used in Persian medicine; it is credited with expectorant properties and is given for relieving difficult respiration.

Arabic: Shairuljin, Shiruljin—; *Catalan*: Capillera, Falsia—; *Colombia*: Cilantrillo, Culantrillo—; *Dutch*: Venushaar, Vrouhenhaar—; *Egypt*: Kuzbaret-el-bir—; *English*: Maidenhair Fern, Maria's Fern, Our Lady's Hair—; *French*: Adiante, Adianthe, Capillaire, Capillaire commun, Capillaire d'Italie, Capillaire de Montpellier, Capillaire vrai, Cheveux de Vénus—; *German*: Frauenhaar, Venushaar—; *Greek*: Adianton—; *Gujerati*: Hanspadi—; *Hindi*: Hansraj, Mubaraka, Pursha—; *Indo-China*: Duoi chon, Thiet tuyen thao—; *Italian*: Adianto, Capelvenere, Capillare, Capilvenere—; *Kashmir*: Dumtuli—; *Kumaon*: Mubaraka—; *La Reunion*: Capillaire—; *Lepcha*: Luk-sip, Ruk-sip—; *Malta*: Maidenhair, Capelvenere, Tursin il Bir—; *Pacific Coast*: Black Maiden's-hair, Lady's hair, Maidenhair, True Maiden's-hair, Venus's-hair Fern—; *Persian*: Barr-i-sija waschan, Kashburat-el-bir, Parsia washan, Pusia wechame, Sirsiapeshane—; *Portuguese*: Avenca, Cabellos de Venus, Capillaria, Herva capillar—; *Roumanian*: Chica-voinicului, Perul fetei, Perul sfantei Marii, Vergura invelita—; *Russian*: Adiant, Krasnyi jenskiy volos—; *Salt Range*: Parasigavashan, Parshavarsha—; *Spanish*: Capilera, Capilera de Mompeller, Culantrillo de pozo—; *Suto*: Pata-lewana, Pata-mawa—; *Teheran*: Kashburat—; *Trans-Indus*: Bisfaif, Kirwatzei—; *Turkish*: Baldirikara—.

6. **Adiantum aethiopicum** Linn. (=*A. emarginatum* Bedd.) is found in North Kanara, and at the higher elevations on the Nilgiris, and the Pulney Hills. It extends to Ceylon, Australia, New Zealand, La Reunion, Madagascar, Cape Colony, Natal, Zambesiland, the Cameroon Mounts up to 7,000 ft., Abyssinia, Spain, and Afghanistan. It also occurs from Texas and California southward to Valparaiso and Montevideo.

An infusion of the leaves is commonly used as an emollient in coughs and diseases of the chest.

At La Reunion the plant is a popular cough medicine, and much used as a sudorific.

In Basutoland a decoction of the caudex is used to promote

parturition. The natives smoke the leaf for colds in the head and the chest.

Afrikaans: Vrouehaar—; *South Africa*: Large Maidenhair—; *Suto*: Maorumetsoo, Pata-lewana, Pata-mawa—.

7. **Adiantum cuneatum** Langs. and Fisch. is a native of Brazil, very common in cultivation. It runs into many varieties and is difficult to identify.

In Brazil the leaves are a popular cough medicine. The plant is considered a good sudorific.

8. **Adiantum pedatum** Linn. grows all along the Himalayas from Kashmir to Sikkim; scattered, and not plentiful. It extends to China, Manchuria, Japan. It is found abundantly from Unalashka and Canada, southwards to Virginia and California, in wet lands and woods.

The plant is employed in France and North America as a pectoral in chronic pulmonic catarrhs. It is also said to be endowed with astringent and emmenagogue properties.

English: Canadian Maidenhair—; *French*: Capillaire du Canada—; *Pacific Coast*: American Maidenhair, Hair Fern, Rock Fern—; *Spanish*: Capilera del Canada, Culantrillo del Canada—.

9. **Adiantum flabellulatum** Linn. is very common in some parts of India: Nepal, Assam, Khasia, Sylhet. It is found in the Ouvah District of Ceylon, in the Malay Peninsula and the Malay Archipelago, Southern China, Japan.

The rhizome is used as an anthelmintic in the Manipur State and in Annam.

The herb is used in China as a cough medicine.

Annam: Thiet tien thao—; *Chinese*: T'ieh Hsien Ts'ao—.

Aspidium.

The genus consists of 50 species distributed throughout the Tropics.

The following species are used medicinally in Europe—*A. fragile* Sw., *A. roeticum* Linn.—; in China— *A. falcatum* Sw.—; in North America—*A. marginale* Sw., *A. spinulosum* (Mill.) Sw., *A. triofoliolatum* Sw.—; in South Africa—*A. aculeatum* Sw. var. *pungens* Klf., *A. athamanticum* (Hook.) Kuntze—.

Of the numerous species found growing in India, two are therapeutically active:—

I.	Indusium orbicular, veins generally anastomosing acutely with free veinlets from their junction; fronds 1-2 ft. long by 6-9 in. broad; sori small copious, scattered ...	1. *A. falcatum.*
II.	Indusium often quite absent, peltate orbicular, or reniform, veins copiously anastomosing with free included veinlets; fronds 1-4 ft. long by 1 ft. or more broad; sori on the netted veins, small and scattered in the uncontracted fronds, large and more or less in two rows between the main veins in the contracted ones.	2. *A. polymorphum.*

1. **Aspidium falcatum** Sw. grows in North-Western India and extends from Kashmir and the Punjab to Sikkim and Bhutan, Assam and the Khasia Mountains without being common any-

where; also in the Nilgiris at the higher elevations. It is found in China, Japan, the Sandwich Islands, Caffraria, Natal, and Madagascar.

The Chinese use the rhizome as an anthelmintic, chiefly for the expulsion of the tapeworm.

Chinese: Kuan Chung—.

2. **Aspidium polymorphum** (Wall.) Bedd. grows in the western forests of the Madras Presidency up to 4,000 ft.; in Northern India from Garhwal to Mishmee and Chittagong; in Burma, Ceylon, the Malay Archipelago, the Philippine Islands, and Fernando Po.

The rhizome is used as an anthelmintic.

Asplenium.

This cosmopolitan genus numbers 540 species.

The following species are used medicinally in Europe—*A. adiantum-nigrum* Linn., *A. ruta-muraria* Linn., *A. trichomanes* Linn.—; in La Reunion—*A. adiantum-nigrum* Linn.—; in South Africa—*A. adiantum-nigrum* Linn., *A. cuneatum* Linn., *A. furcatum* Thunb., *A. monanthemum* Linn., *A. trichomanes* Linn.—; in Brazil—*A. regulare* Sw., *A. sulcatum* Lam.—.

Five therapeutically active species are met with in India:—

I. Fronds pinnate.		
a. Fronds 6-12 in. long, about ½ in. broad; sori linear oblong, 3-6 on each side of the midrib	1.	*A. trichomanes.*
b. Fronds 6 in. long to 2 ft. long or more, 4-8 in. broad; sori in long irregular lines reaching nearly to the margin	2.	*A. falcatum.*
II. Fronds bi-quadripinnate.		
a. Fronds 1-2 in. long, about 1 in. broad; sori copious	3.	*A ruta-muraria.*
b. Fronds 6-12 in. long, 4-6 in. broad at the base; veins obscure, oblique; sori copious ...	4.	*A. adiantum-nigrum.*
c. Fronds coriaceous 6-18 in. long, 4-6 in. broad; veins flabellate, deeply channelled; sori linear	5.	*A. furcatum.*

1. **Asplenium trichomanes** Linn. is a common Himalayan fern occurring from Afghanistan to Kumaon at altitudes of 5,000-11,000 ft. It is very common from 5,000 to 9,000 ft. in the Simla Region. It has been found in South India at Kulhatty on the Nilgiris. It occurs in Japan, Java, Australia, Tasmania, and New Zealand, sub-arctic Greenland, Canada and westward to the Rocky Mountains, British Columbia, the United States, Bermuda and southward to Panama, the West Indies Islands, and from Guiana and Venezuela to Bolivia.

This is the common Maidenhair of the British Isles, distributed over the continent of Europe 'throughout its length and breadth, from Iceland and Lapland to the Rock of Gibraltar; throughout the Mediterranean Region; and from the extreme west of Ireland to the extreme east of Europe', Siberia and Persia. It thrives equally well in the Azores and the Macaronesian Isles,

Algeria, Morocco, Abyssinia, Somaliland, the Ruwenzori Mountain of Central Africa, and the Cape of Good Hope.

Its leaves are sweet, mucilaginous, and expectorant, being therefore highly useful in many pulmonary disorders. A tea brewed from them is one of the common English remedies for a violent cold and for tedious coughs. 'We have the common Maidenhair, which grows on old walls, and which will act as a laxative medicine; whilst idiots are said to have taken it remedially, so as to recover their senses.'

In Basutoland the leaf is smoked for colds in the head and chest.

Catalan: Falsia roja—; *English*: Common Spleenwort, Maidenhair—; *French*: Polytric des officines—; *German*: Rotes Frauenhaar—; *Languedoc*: Fau capillero—; *Spanish*: Politrico—; *Suto*: Lehorometso—; *Tamil*: Mailakkondei—.

2. **Asplenium falcatum** Lam. is found in the western mountains of the Madras Presidency, in Ceylon, the Malay Peninsula, Australia, Polynesia, South Africa and its islands.

In Goa and Malabar the plant is used as an alterative in cases of prolonged malarial fever.

Bombay: Pana—; *Goa*: Pandan—; *Malayalam*: Nelapannamaravara—.

3. **Asplenium ruta-muraria** Linn. is common in Afghanistan and extends through Kashmir and Baltistan as far as West Nepal, with a gap between West Kashmir and Kumaon. It is found in Turkish Armenia, the Ural Mountains to Caucasus, Turkestan, Tibet, and Siberia, Algiers, the Cape Colony, and many parts of the United States. It is distributed all over Europe: from Arctic Regions, to Spain and Portugal, Italy, the Mediterranean Isles, Greece, and Turkey.

This small herb is still used to some extent in England as a deobstruent and expectorant.

'The Wall Rue is likewise good for them that have a cough, or are shortwinded, or be troubled with stitches in the sides. It stayeth the falling or shedding of the hair, and causeth them to grow thick, fair, and well coloured. Also it helpeth ruptures in children.'

The Fern has been called Tentwort, from its use as a specific or sovereign remedy for the cure of rickets, a disease once known as 'the taint'.

In China it is considered a valuable medicine for the treatment of pulmonary diseases.

Catalan: Falsia blanca, Ruda de rata—; *Chinese*: Koui Ts'ang—; *English*: Tentwort, Wall Rue—; *French*: Capillaire blanc, Doradille des murailles, Rue des murailles, Sauve-vie—; *German*: Weinkraeutel—; *Spanish*: Calantrillo blanco mayor—.

4. **Asplenium adiantum-nigrum** Linn. is found in Afghanistan and Kashmir, at 5,000-8,000 ft., extending to Dalhousie and Chamba. It occurs in Java, the Sandwich Islands, Azores, Canaries, Madeira, Cape Verde Isles, St. Helena, Mascarene Isles, Cameroon Mounts, Algeria, Abyssinia, Natal, the Cape Colony. It is distributed all over Europe—the United Kingdom, Norway and

Denmark, through Holland, Belgium, Germany, France, Switzerland, Austria, Spain, Portugal, Mediterranean Region, Greece, Turkey— and Northern Asia—Armenia, Syria, Arabia, Persia, and Siberia—.

Yunanists describe the plant as bitter, diuretic, laxative, lessening inflammations and abating hiccough, producing sterility in women. They consider it useful in the treatment of ophthalmia and diseases of the spleen.

A decoction or syrup of the fronds is used as an expectorant, pectoral, and emmenagogue in Europe.

The rhizome is used as an anthelmintic in Basutoland.

Catalan: Falsia negra—; *English*: Black Spleenwort—; *French*: Capillaire noir—; *La Reunion*: Capillaire noir—; *Spanish*: Capilera negra—; *Suto*: Lehorometso—.

5. **Asplenium furcatum** Thunb. is common on the higher western mountains of South India, and in Ceylon at 5,000-7,000 ft. It is found in Tropical America, the Polynesian Islands, Australia, Cape Colony, Abyssinia, the Mascarene Islands, and Canaries.

The rhizome is used as an anthelmintic in Basutoland.

Suto: Lehorometso—.

Athyrium.

This cosmopolitan genus numbers 120 species.

Athyrium filix-foemina Roth. is found all along the Himalayas from Afghanistan to Sikkim, at 6,000-13,000 ft., and extends to Sind and the Bombay Presidency. It occurs throughout Europe from Lapland, Russia and Scandinavia to Spain, Portugal, Italy, Greece, Crete, and the Caucasus. From Japan and Kamschatka it crosses to Sitka and Labrador, Canada, British Columbia, the United States, Cuba, Caraccas and Venezuela. It is also met with in the Azores and Macaronesian Isles, Algeria, the mountains of Cameroon, Abyssinia, and Natal.

The rhizome is supposed to possess vermifugal properties similar to those of the male fern for which it is used as an occasional substitute.

In Germany the rhizomes of this fern are frequently found mixed with those of the true male fern.

Catalan: Falguera femella—; *Spanish*: Helecho hembra—.

Blechnum.

This genus consists of about 60 species, mostly tropical American.

Blechnum orientale Linn. is found throughout India, Ceylon and the Malay Peninsula, up to 6,000 ft. in the south, and 4,000 ft. on the Himalayas. It extends to the Malay Islands, China, Polynesia, and Australia.

The rhizome is used in China as an anthelmintic.

Cantonese: Kun chung—; *Chinese*: Kuan Chung—; *Malaya*: Koon choong—.

Botrychium.

A cosmopolitan genus consisting of about 40 species, three of which are credited with medicinal properties.

I.	Stipes erect, smooth, cylindrical, hollow, succulent; vernation plicate or folded straight; the fertile branch clasped by the sterile before unfolding, pinnate or bipinnate	1. *B. lunaria.*
II.	Stipe 1-2 in. long; petiole of the sterile segment 2-8 in. long, the latter 3-6 in. each way; fertile peduncle up to 18 in. long, generally considerably over-topping the sterile segment	2. *B. ternatum.*
III.	Stipes 3-8 in. long; sterile portion not prolonged beyond the fertile spike 4-12 in. each way; fertile branch of the rachis springing from the base of the sterile portion or from the middle of it	3. *B. virginianum.*

1. **Botrychium lunaria** Sw. is profuse in Afghanistan at 9,000-10,000 ft., common from Kashmir to Sikkim ascending up to 13,000 ft., and extending to the Karakoram Range in Western Thibet. It is found in South Australia, Tasmania, New Zealand, Japan, Kamschatka, Greenland, Newfoundland, Canada, British Columbia, New York, Lake Superior, Colorado, Patagonia, Iceland, Arctic Russia, Livonia, Lithuania and Caucasia, the British Isles, Spain, Italy, Switzerland and the Mediterranean Isles.

The plant is considered a good vulnerary. It is also much used in dysentery.

'This herb is cold and drying, and is available for wounds both outward and inward. The leaves boiled in red wine, and drank, stay immoderate courses and the whites. It stays bleeding, vomiting, and other fluxes. It helps all blows and bruises, and consolidates all fractures and dislocations. It is good for ruptures, and is put into oils and balsams to heal fresh and green wounds.'

English: Moonwort—; *French*: Herbe aux serpents, Petite lunaire—; *German*: Walpurgiskraut—; *Italian*: Vindicta—.

2. **Botrychium ternatum** (Thunb.) Sw. is found in the Himalayas from the Punjab to Nepal and Sikkim, and has been reported from Mount Abu. It extends to Tasmania and New Zealand, Japan, Siberia and Kamschatka, Nootka and Hudson's Bay Territory, Canada, New England, westwards to California, Washington, and southwards to Florida, hence to New Grenada. In Europe it occurs in Lapland, Hungary, and the Pyrenees.

The plant is used as a vulnerary in China; and the root is prescribed in dysentery.

Chinese: Yin Ti Chueh—; *Indo-China*: Am dia guyet—.

3. **Botrychium virginianum** Sw. occurs in the Himalayas from the Punjab to Sikkim. It is found from Norway to Austria, in Ecuador and Brazil, from New Brunswick to Florida, and westwards to Arizona and the Pacific Coast—British Columbia southwards to Oregon.

The fleshy root is used by American Indians in application to cuts and bruises.

Pacific Coast: Grape Fern, Moonwort, Rattlesnake Fern—.

Ceratopteris.

The only species known, **C. thalictroides** Brong., is found throughout India, Ceylon, and the Malay Peninsula up to 3,000 ft. elevation; common in tanks, ditches, and swampy places, or even dry ground during the rains. It extends to the Great Coco Island, the Nicobar Islands, Java, the Philippine Islands, Japan, China, Hongkong, South Florida, Mexico, and the West Indies southwards to Brazil. It also occurs in Arabia Felix and South-Eastern Arabia; and is found in Tropical West Africa, Angola, and Madagascar.

The plant is used in China as a tonic and styptic.

Chinese: Shui Chueh—.

Cheilanthes.

The genus consists of 120 species, inhabiting tropical and temperate regions.

C. hirta Swartz. is used medicinally in South Africa.

Cheilanthes tenuifolia Sw. is common in the Madras Presidency, in the plains and on low hills up 4,000 ft. It occurs in Bengal, in the plains of Assam, Chittagong, Dacca, Chota Nagpore, in Khasia up to 5,000 ft., Sikkim, the Malay Peninsula, and the Malay Islands. It extends to China, Australia, New Zealand, Polynesia, and Uruguay.

The Santals prescribe a preparation from the roots for sickness attributed to witchcraft or the evil eye.

Santali: Dodhari, Nanha—; *Tasmania*: Parsley Fern—.

Cibotium.

This genus contains 10 species, inhabiting tropical America, Polynesia, and Asia.

Cibotium barometz Link. (=*C. glaucum* Bedd.) is found in Mishmi, Assam, and Tavoy, extending to the Malay Islands and South China.

The drug consists of the lower part of the caudex, reddish brown in colour, in longitudinal slices, covered on the outside with golden brown moniliform hairs suggesting the fur of an animal. The hairy rhizome thus sometimes resembles a lamb, hence the specific name *barometz*, Russian for lamb. It is the Agnus Scythicus, or Tartarian or Vegetable Lamb, a drug of great repute alluded to in medical works of the sixteenth and seventeenth centuries.

The root is employed in China as a tonic, and is said to exercise a special action on the genito-urinary organs. It is also given for lumbago.

In Annam the stems are considered tonic and styptic. The rhizome, like other fern roots, is used as a vermifuge.

The golden brown hair from the base of the fronds is used in Malaya, Java and Sumatra for stanching wounds. It has the power of causing rapid coagulation of blood, and, when properly used, of mechanically arresting hemorrhages from capillaries. It

has been much used in the physiological laboratories of Europe and America, and was employed in human medicine during the Middle Ages.

Annam: Bach chi, Cau quyet, Cau thank, Cau tich, Cay cu lan, Cay cu li, Cay cu lon, Cay ku lien, Cay tien phuong vi, Cuong lu, Cu seoga, Kim Mao, Phu can—; *Cantonese*: Kau Tsek—; *Chinese*: Kou Chi, Toei Choun—; *French*: Agneau de Scythie, Agneau de Tartarie, Chien roux, Poil de singe—, *Malaya*: Kow chiak—.

Cystopteris.

This genus consists of 5 species distributed through the temperate regions of the world.

Cystopteris fragilis Bern. is found in Afghanistan and on the Himalayas from Kashmir to Sikkim ascending to 10,000-15,000 ft. It extends to Australasia, New Zealand, the Sandwich Isles, the Arctic and temperate regions of North America, California, Mexico, and through the whole length of the Andean Chain. It is found in the West Indies, and everywhere in Europe from Iceland and Novaya Zemlya and Spitzbergen in the Arctic Regions to Spain, Sicily, Cyprus and the Caucasus. It also occurs in the Lebanon, Persia, Kurdistan, Siberia, Manchuria, Kamschatka, Tibet, and North China. It is distributed to Madeira, Fernando Po, Abyssinia, and South Africa.

The Sutos of Basutoland use a decoction of the rhizome as an anthelmintic enema.

Suto: Lehorometso—.

Drymoglossum.

This tropical genus numbers about 10 species.

Drymoglossum carnosum Hook. is common in Nepal, Sikkim, and Bhutan at 2,000-5,000 ft. elevation. It extends to China and Japan.

The fronds are pectoral, diuretic, and astringent. They are used in China in urinary calculus and rheumatism.

Chinese: Lo Yen Ts'ao—.

Drynaria.

This genus consists of 20 species, inhabitants of the Palaeotropics.

Drynaria quercifolia J. Sm. (=*Polypodium quercifolium* Linn.) is found throughout India, in the plains or very low down on the mountains, on trees or rocks.

The Ayurvedists describe the rhizome as bitter, tonic, astringent to the bowels, and useful in the treatment of typhoid fever.

The plant is commonly used in the treatment of phthisis, hectic fever, dyspepsia, and cough.

Ilocano: Capcapa—; *Malayalam*: Pannakilhannumaravala—; *Marathi*: Ashvakatri, Basingh, Wandurbashing—; *Pampangan*: Gona, Tibatib—; *Sanskrit*: Ashvakatri—; *Tagalog*: Pacpaclauin, Paipaiamo—; *Visayan*: Cabcab, Cabcaban, Cabcabun—.

Dryopteris.

This genus numbers 250 species found distributed throughout the northern temperate regions.

It is probable that all of the species of this genus possess more or less anthelmintic properties. The following are commonly used in China—*D. sophoroides* O. Kuntze—; in Japan—*D. crassirhizoma* Nakai—; in North America—*D. marginalis* (Linn.) Asa Gray, *D. rigida* Underw.—; in South Africa—*D. athamantica* (Ktze) O. Kuntze, *D. inaequalis* O. Kuntze.— But by far the most famous species is *D. filix mas* (Linn.) Schott, one of the oldest drugs known, and one which is still retained by all pharmacopoeias.

Dryopteris filix-mas (Linn.) Schott.—Male Fern—.

The synonyms for the male fern are extraordinarily numerous, and the following are among the better known or more commonly occurring:—*Aspidium filix-mas* of many authors, *A. wildeanum* Goeppert, *Dryopteris filix-mas* (Linn.) Schott, *Lastrea filix-mas* Presl., *Lophodium filix-mas* Newm., *Nephrodium filix-mas* Rich., *Polypodium filix-mas* Linn., *P. nemorale* Salisb., *Polystichum abbreviatum* DC., *P. durum et induratum* Schur., *P. filix-mas* Roth., *Tectarea filix-mas* Cavan. Since the term *Dryopteris* was first used by Amman in 1739, and applied in 1763 by Adamson, as the name of the genus to which the term *Aspidium* was applied in 1800 by Swartz, the use of the generic term *Dryopteris* would seem to be necessitated by the laws of botanic nomenclature.

The Male Fern is of very wide distribution, occurring in America from Greenland, westwards and southwards, along the Rocky Mountains and Andes to Peru. It is found throughout Europe, in North Asia, eastwards to China and Japan. It is also distributed to Abyssinia, the Azores and Macaronesia. In the Indian region it is generally confined to considerable elevations—6,500-11,000 ft.—on the mountains, from the Lowari Pass to Kashmir, Chamba, Kullu, the Simla Region, and Garhwal.

The male fern has been recommended as a local application in eczema and acne. It is, however, as a vermifuge that the drug is better, if not exclusively, known. It is as such that it is mentioned in the works of Dioscorides, Theophrastus, Galen and Pliny, and by some of the earlier modern writers. It is now used in medicine almost solely for the purpose of getting rid of various intestinal parasites, especially the *tapeworm*. As to its value in other forms of helminthiasis there is difference of opinion. Some authors report as many as 75 per cent of cures in cases of *hookworm* infection, but other workers state that the drug has been found absolutely without value in this infection. There has been a great deal of uncertainty as to the efficacy of male fern, especially in tropical climates, and many observers have found it to be not only inefficient and unreliable, but a toxic and a dangerous remedy.

A large amount of chemical work has been done and a number of substances have been isolated from the drug, but the chemical nature of the different constituents is still not clear. This is not

surprising as these compounds are unstable bodies and undergo chemical changes in the dry rhizome as well as in the preparations of the oleoresin and the ethereal extract. That is one of the reasons why such widely controversial results have been obtained regarding their physiological activity.

No doubt that the rhizomes of other species of fern are frequently substituted for the 'official', and that in the dried state it is difficult to distinguish them; but which is the official form? A look at herbariums will convince any one that a heterogeneous mass of plants is named *filix-mas*. A talk with the leading pteridologists of the day will further bring home the astounding information that experts are not agreed that even the European forms of *filix-mas* all belong to the same species!

Catalan: Falguera mascle—; *Danish*: Bregne—; *Dutch*: Varen Kruid—; *English*: Male Fern, Shield Fern—; *French*: Fougère mâle—; *German*: Farnkraut, Farnwurzel, Wurmfarn—; *Hungarian*: Erdei pajzsikapapany—; *Italian*: Felce maschio—; *Naples*: Fielici, Filici—; *Norwegian*: Bregne—; *Pacific Coast*: Aspidium, Basket Fern, Bear's Paw, Knotty Brake, Male Fern, Male Shield Fern, Sweet Brake—; *Piedmont*: Fales, Feles, Fleis—; *Portuguese*: Dentebrura, Feto macho—; *Potenza*: Fivece—; *Puglia*: Fidvitti—; *Reggio*: Felsa mas'c—; *Sardinia*: Filighee mas'cia, Filixi maschin—; *Spanish*: Helecho macho—; *Swedish*: Ormbunk, Traejon—; *Treviso*: Felese mas'cio—; *Turkish*: Serhasi müzekker—.

Gleichenia.

This genus consists of 25 species inhabiting tropical and subtropical regions.

Gleichenia dichotoma Willd. is found in the mountains of Southern India and Ceylon, up to 6,000 ft., Kumaon, Nepal, Sikkim, and Bhutan, Khasia Hills up to 5,000 ft., Sylhet, Pachmarhi, Tenasserim, South Andamans, the Malay Peninsula, Sumatra, East Timor, Tropical Australia, Japan, America—.

In Annam the rhizome is used as an anthelmintic. In Madagascar the fronds are given as a cure for asthma.

Annam: Hac cot mang, Hac cot phuong, Tieu ly bach—; *Madagascar*: Ampangantsirika—.

Helminthostachys.

The only species, **H. zeylanica** Linn., is found in South India, in the western forests in swampy places up to 3,000 ft. elevation. It also occurs in Ceylon, about Colombo and other parts of the western and southern provinces, in the plains of Bengal to Assam and Cachar. It extends to the Malay Peninsula, the Malay Islands, the Philippine Islands, Tropical Australia, and New Caledonia.

It is regarded in the Moluccas as a mild aperient.

Annam: Quan trong—; *French*: Osmonde de Ceylan—.

Hemidictyum.

This genus consists of 2 species found mostly in temperate regions.

Hemidictyum ceterach Linn. (=*Asplenium ceterach* Linn. =*Ceterach officinarum* Willd.) occurs on the rocks overhanging the

Karriah River in the Kurram Valley, but is rare there. It is very common in Kashmir, Punjab, and Garhwal ascending up to 9,000 ft. It is found in many parts of Germany, in Switzerland, the Tyrol, Hungary, Dalmatia, the Caucasus, Belgium, France, Spain, Italy, Greece. In Britain it is to be seen in all or nearly all the southern, northern, and western counties; 'in Somersetshire and Devonshire it is especially abundant, in Scotland it is much less frequent' chiefly in the west and south-west; it is frequent in Ireland, though local. It extends to Palestine and Persia, the Canaries, Madeira and Cape Verde Islands, Morocco, Algiers, Abyssinia, and the Cape of Good Hope.

'No herbe maie be compared therewith for his singular virtue to help the sicknesse or grief of the spleen', says one of the oldest Herbals. 'It is generally used against infirmities of the spleen, helps the strangury, and wastes the stone in the bladder, and is useful against the jaundice and the hiccough', states Culpeper.

The plant is considered diuretic and astringent. It is still occasionally used in France for diseases of the urinary tract. The rhizome is used medicinally in several parts of Europe for enlargement of the spleen, incontinence of urine, calculus, jaundice, and malaria.

Dioscorides mentions the use of a decoction of the plant in vinegar for enlargement of the spleen, and also the local application of a plaster made of the leaves steeped in wine. Women were not allowed to use it as it was supposed to cause sterility. Pliny ordered 'it should not be given to women, because it bringeth barrenness'.

The rusty-coloured scales under the blades were at one time used as a cure for gonorrhoea.

Catalan: Dauradella, Herba daurada—; *English*: Finger Fern, Miltwaste, Rusty Back, Scaly Fern, Spleenwort, Stone Fern—; *French*: Cétérach officinal, Dauradille, Doradille, Doradille cétérach, Doradille d'Espagne, Herbe dorée, Scolopendre vraie—; *German*: Milzfarn—; *Portuguese*: Douradinha, Escolopendra—; *Spanish*: Capilera dorada, Ceterach, Doradilla—.

Lygodium.

This genus numbers 22 species to be found in tropical and subtropical regions.

Two of the species are credited with medicinal properties:—

Pinnules 8-12 in. long, 6-12 in. broad ...	... 1. *L. flexuosum.*
Pinnules smaller, 4-8 in. long, about as broad	... 2. *L. japonicum.*

1. **Lygodium flexuosum** Sw. (=*L. pinnatifidum* Sw.) is very common in the Dehra Dun, Kumaun, Sajahanpur, Gorakhpur; it is abundant throughout the plain in Bengal up to 5,000 ft., and also on both sides of the Madras Presidency up to about 4,000 ft. It extends to Ceylon, the Malay Peninsula, the Philippine Islands, North Australia, Angola, and the Guinea Coast.

The plant is commonly used as an expectorant.

In Tirhut the fresh root is boiled with mustard oil and used externally in rheumatism, sprains, scabies, ulcers, eczema, and cut wounds. It is particularly useful as a local application to carbuncles.

In Indo-China an infusion of the plant is used in blennorrhagia; it is said to be a good lactagogue.

Indo-China: Bong bong, Duong vong, Thach vi day—; *Malayalam*: Vallipanna—; *Tirhut*: Kalazha—.

2. **Lygodium japonicum** Sw. occurs abundantly in North India from Kashmir to Sikkim and Bhutan from 2,000-7,000 ft. elevation. It is rare in the western mountains of South India. It is distributed to Ceylon, Java, the Philippine Islands, China, Japan, and North Australia.

The plant is used as an expectorant in China. It is also used in haematuria and blennorrhagia.

Chinese: Hai Chin Sha—; *Indo-China*: Hai kim sa—.

Ophioglossum.

This genus consists of 30 species inhabiting tropical and temperate regions.

Ophioglossum vulgatum Linn. occurs in North India from Chamba State to Sikkim ascending up to 9,000 ft. on Mount Hattu and 2,000 ft. below Darjeeling; it is also found in Chota Nagpore on the Parasnath Mount at an altitude of 2,500 ft. It extends to Japan, the Sandwich Islands, Australia, and New Zealand. It is met with in North America, from Quebec and Ontario southwards to Florida and California, Kentucky, Tenessee, Texas and Arizona to Alaska. In Europe it inhabits Lapland, the British Isles and almost all other countries to Caucasia. In Africa it occurs in the Azores, Abyssinia, the Guinea Coast, Angola, St. Helena, Zambesiland, Cape Colony, and the Mascarene Isles.

A preparation from this plant, known as the 'green oil of charity', is in request in England as a vulnerary and remedy for wounds.

The plant is held in France and Spain as a vulnerary of great repute.

The plant yields a mucilaginous and astringent decoction which is used in angina in La Reunion. The fronds are considered tonic and styptic, and used in contusions, wounds, and haemorrhages.

A warm decoction of the rhizome is used by the Sutos as a lotion for boils.

Catalan: Llansa de Cristo, Llengua de serp—; *English*: Adder's Tongue, Christ's Spear—; *French*: Herbe à daucune, Herbe sans couture, Lance de Christ, Langue de serpent, Luciole, Ophioglosse, Ophioglosse commune, Petite serpentaire, Serpentine—; *Hausa*: Mashinzomo—; *La Reunion*: Herbe un coeur, Herbe paille-en-queue, Langue de serpent—; *Spanish*: Lengua de serpiente—; *Suto*: Mmadiyo, Tsebe-ngwe, Tseyananyane—.

Osmunda.

This genus consists of 10 species distributed throughout the temperate and tropical countries of the world.

Fronds 2-4 ft. long, 1 ft. or more broad, bipinnate ... 1. *O. regalis.*
Fronds 1-2 ft. long, 8-12 in. broad, simply pinnate ... 2. *O. claytoniana.*

1. **Osmunda regalis** Linn. is common on the western mountains of South India at the higher elevations; it is found in the

Himalayas from the Chamba State to Sikkim and Bhutan, but has become very rare in the Simla region; it is common, or at least frequent, in the Khasia District up to 4,000-6,000 ft., in the Central Provinces, and in the Bombay Presidency. It extends to South and West China, Hongkong, Japan, Canada and the Saskatchewan to Brazil. In Europe it is distributed over the British Isles, Sweden and Russia to Spain, Italy, Turkey, and to Siberia. It is met with in the Azores, Algeria, Tunis, Abyssinia, Angola, Central Africa, Nyassaland, Zambesiland, Natal, Cape Colony, and the Mascarene Isles.

The plant is a well known tonic and styptic, and is still very much employed all over Europe. It is used for rickets in England and in France.

The white centre of the root, boiled in some kind of liquor, was supposed good for persons wounded, dry-beaten, and bruised, or that have fallen from some high place.

The root or rhizome stamped in water or gin till 'the liquor becometh a stiff mucilage, has cured many deplorable pains of the back, that have confined the distracted sufferers close to bed for several weeks.' This mucilage was to be rubbed over the vertebrae of the back each night and morning for five or six days together. Also for rickets, 'take of the powdered roots with the whitest sugar, and sprinkle some thereof on the child's pap, and on all his liquid foods. It maketh a noble remedy without any other medicine.'

The tender sprigs of the plant at their first coming are 'good to be put into balmes, oyles, and healing plasters'.

This is much more effectual than the other ferns, both for inward and outward uses, says Culpeper. It is accounted singularly good in wounds, bruises, or the like; the decoction to be drunk, or boiled into an ointment of oil, as a balsam or balm, and so it is singularly good against bruises, and bones broken, or out of joint, and gives much ease to the colic and splenetic diseases; as also ruptures and burstings.

In Guinea an extract is prepared and is used externally for rheumatism and internally for intestinal griping.

English: Flowering Fern, Osmond Royal, Osmund-the-Waterman, Royal Fern, Royal Flowering Fern, Water Fern—; *French*: Fougère aquatique, Fougère fleurie, Fougère royale, Osmonde, Osmonde fleurie, Osmonde royale—; *Fulah*: Kolo kouli—; *German*: Koenigsfarn, Traubenfarn—; *Hova*: Ampangafenakoho—; *Indo-China*: Vi—; *Languedoc*: Fougeiroux—; *Spanish*: Helecho acuatico, Helecho florido, Helecho real—.

2. **Osmunda claytoniana** Linn. is found growing in the Himalayas from Kashmir to Bhutan at 6,000-10,000 ft. elevation, in the Khasia Mountains up to 4,500-6,000 ft. It also occurs in Canada, Newfoundland, and throughout the United States.

The rhizomes are used as an adulterant for Male Fern in the American market.

Pellaea.

This genus consists of 40 species found in subtropical regions.

P. calomelanos Link., *P. consobrina* Hook., *P. hastata* (Thunb.) Prantl., *P. involuta* Bkr. are used medicinally in South Africa.

Pellaea calomelanos Link. is found in the Sirmur State, Dehra Dun, Garhwal, Kumaon, ascending up to 5,000 ft. It extends to Angola, Abyssinia, Somaliland, the Ruenzori Mounts, Zambesiland, Mashonaland, Natal, Cape Colony, and La Reunion.

The Sutos use the rhizome as an anthelmintic, and smoke the leaf for colds in the head and chest.

Suto: Lehorometso, Pata-lewana, Pata-mawa—.

Pleopeltis.

This genus numbers 35 species distributed throughout tropical and subtropical regions.

Pleopeltis lanceolata Linn. is found on the Nilgiris and higher mountains on the west side of the Madras Presidency, and extends to Assam and Ceylon. It occurs in Tropical America and the West Indies, South Africa and its islands, St. Helena, and the Sandwich Islands.

In Mexico a tea made from the fronds is taken to cure the itch.

Pteris.

A cosmopolitan genus numbering 160 species.

P. aquilina Linn. is used medicinally in Europe, China, La Reunion—; *P. multifida* Poir. in China—; *P. leptophylla* Sw., *P. palmata* W., *P. pedata* Sw. in Brazil—; *P. buchanani* Bkr. in Basutoland—.

Pteris aquilina Linn. is very common in the Himalayas, common in the Khasia Hills at 2,000-8,000 ft. It extends to the Deccan, the Madras Presidency, Ceylon, Tenasserim, the Malay Peninsula, and eastwards to Australia and New Zealand. It is universal in Europe, except in the extreme north, and never an Alpine plant; its range in the British Isles is said to agree closely with that of corn cultivation, and in the Scottish Highlands it never rises above 2,000 ft. It is found in the Cameroon Mountains and in Abyssinia. In general it may be said to thrive all round the world, both within the Tropics, and in the North and South Temperate Zones.

The rhizome is reputed astringent and anthelmintic.

A decoction of the rhizomes and fronds has been given in chronic disorders arising from obstructions of the viscera and spleen.

'For thigh aches smoke the legs thoroughly with Fern braken.'

'The roots being bruised and boiled in mead, or honeyed water, and drunk, kills both the broad and long worms in the body, and abates the swelling and hardness of the spleen. The green leaves eaten, purge the belly, and expel choleric and waterish humours that trouble the stomach. They are dangerous for women with child to meddle with by reason they cause abortions. The roots bruised and boiled in oil, or hog's grease, make a very profitable ointment to heal wounds, or pricks gotten in the flesh. The powder of them used in foul ulcers, dries up their malignant moisture, and causes their speedier healing.'

Cantonese: K'uet—; *Catalan*: Falguera femella—; *Chinese*: Chueh—; *Dutch*: Groote varen, Varen—; *English*: Bracken, Brakes, Female Fern—;

French: Filipode, Fougère à l'aigle, Fougère commune, Fougère femelle, Fougère impériale, Fruchière, Ptéride—; *German*: Adlerfarn, Farmkrautweiblein, Fluegelfarn, Jesuschristuswurzel—; *Indo-China*: Guyet—; *Ireland*: Fern of God—; *Languedoc*: Feuvé—; *Malaya*: Keat—; *Malayalam*: Tavi—; *Malta*: Bracken, Eagle Fern, Felce aquilina, Felce capannaja, Felicilla, Felicita—; *New Caledonia*: M'Baoue—; *Portuguese*: Feto—; *Punjab*: Dio, Kakei, Kakhash, Lungar—; *Roumanian*: Navalnic pajuriu, Spinarea lupului—; *Russian*: Paporotnik—; *Saora*: Manmarda—; *Spanish*: Helecho hembra—; *Tamil*: Parnai—.

Stenoloma.

S. chinensis Bedd. (=*Davallia tenuifolia* Hook.) is found in the western mountains of the Madras Presidency at 3,000-6,000 ft.; in the Himalayas from the Simla region to Bhutan at 1,000-7,000 ft., plentiful eastwards; it is common in the Khasia Hills at 1,000-3,000 ft. Central Provinces, Pachmarhi, Ceylon, the Malay Peninsula, Japan. It extends to Polynesia and the Mascarene Islands, being common everywhere.

It is administered internally for chronic enteritis in Mauritius.

Chinese: Wu Chiu—; *English*: Parsley Fern—; *Mauritius*: Petite fougère—.