



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

REPAIRED BY

WISCONSIN

W P A

BOOK REPAIR

PROJECT NO.

10049

Date

November

1940

150 11

APQ3726 (1)

POISONOUS PLANTS
IN FIELD AND GARDEN

POISONOUS PLANTS

IN FIELD AND GARDEN

21-200

BY THE
REV. PROFESSOR G. HENSLOW
M.A., F.L.S., F.G.S., ETC.
AUTHOR OF 'THE MAKING OF FLOWERS,' ETC.

PUBLISHED UNDER THE DIRECTION OF THE GENERAL
LITERATURE COMMITTEE

LONDON:
SOCIETY FOR PROMOTING CHRISTIAN KNOWLEDGE,
NORTHUMBERLAND AVENUE, W.C.; 43, QUEEN VICTORIA STREET, E.C.
BRIGHTON: 129, NORTH STREET.
NEW YORK: E. & J. B. YOUNG & CO.

73049
SEP 17 1903

ROK

COLLEGE OF AGRICULTURE
UNIVERSITY OF WISCONSIN
MADISON

CONTENTS

	PAGE
INTRODUCTION	13
CLASS I	
DICOTYLEDONS	
DIVISION	
I. PETALS, FREE ; WITHOUT ANY RECEPTACULAR EXPANSION	30
II. PETALS, FREE ; FLOWER WITH A RECEPTACULAR EXPANSION	66
III. COROLLA, WITH THE PETALS COHERENT	102
IV. FLOWERS INCOMPLETE ; COROLLA WANTING ; SEXES OFTEN SEPARATE	141
CLASS II	
MONOCOTYLEDONS	
I. PERIANTH SUPERIOR AND OVARY INFERIOR	161
II. PERIANTH INFERIOR AND OVARY SUPERIOR	169
III. FLOWERS WITH GLUMES INSTEAD OF A PERIANTH	178

LIST OF ILLUSTRATIONS

FIG.	PAGE
1. Field Buttercup (<i>Ranunculus acris</i>)	17
2. Vertical section of flower of Strawberry	21
3. Vertical section of flower of Peach (petals removed)	21
4. Vertical section of flower of Rose	22
5. Vertical section of Apple	22
6. Vertical section of flower of Currant	22
7. Stamens and pistil of flower of Pea	23
8. Traveller's Joy (<i>Clematis Vitalba</i>)	32
9. Celery-leaved Buttercup (<i>Ranunculus sceleratus</i>)	36
10. Spear-wort (<i>Ranunculus Flammula</i>)	39
11. Fetid Hellebore (<i>Helleborus fœtidus</i>)	41
12. Aconite (<i>Aconitum Napellus</i>)	43
13. Opium Poppy (<i>Papaver somniferum</i>)	51
14. Celandine (<i>Chelidonium majus</i>)	56
15. Corn-cockle (<i>Agrostemma Githago</i>)	59
16. Wood-sorrel (<i>Oxalis Acetosella</i>)	63
17. Spindle-tree in flower (<i>Euonymus europæus</i>)	67
17*. Spindle-tree in fruit (<i>Euonymus europæus</i>)	68
18. Buckthorn (<i>Rhamnus catharticus</i>)	69
19. Yellow Vetchling (<i>Lathyrus Aphaca</i>)	77
20. Bryony (<i>Bryonia dioica</i>)	83
21. Fool's Parsley (<i>Æthusa Cynapium</i>)	86
22. Hemlock (<i>Conium maculatum</i>)	90

FIG.		PAGE
23.	Water-Hemlock, or Cowbane (<i>Cicuta virosa</i>) . . .	93
24.	Hemlock Water-Dropwort (<i>Enanthe crocata</i>) . . .	95
25.	Fine-leaved Dropwort (<i>C. Phellandrium</i>) . . .	96
26.	Common Water-Dropwort (<i>C. fistulosa</i>) . . .	97
27.	Broad Water-Parasit (<i>Sium latifolium</i>) . . .	98
28.	Dwarf Elder (<i>Sambucus Ebulus</i>) . . .	103
29.	Wild Lettuce (<i>Lactuca virosa</i>) . . .	105
30.	Deadly Nightshade (<i>Atropa Belladonna</i>) . . .	119
31.	Thorn-apple (<i>Datura Stramonium</i>) . . .	123
32.	Henbane (<i>Hyoscyamus niger</i>) . . .	125
33.	Great Mullein (<i>Verbascum Thapsus</i>) . . .	135
34.	Figwort (<i>Scrophularia nodosa</i>) . . .	136
35.	Yellow Rattle (<i>Rhinanthus Crista-galli</i>) . . .	139
36.	Sheep's-sorrel (<i>Rumex Acetosella</i>) . . .	143
37.	Spurge-laurel (<i>Daphne Laureola</i>) . . .	146
38.	Sun Spurge (<i>Euphorbia Helioscopia</i>) . . .	149
39.	Caper Spurge (<i>Euphorbia Lathyris</i>) . . .	149
40.	Mercury (<i>Mercurialis perennis</i>) . . .	151
41.	Yew (<i>Taxus baccata</i>) . . .	158
42.	Black Bryony (<i>Tamus communis</i>) . . .	163
43.	Lords and Ladies (<i>Arum maculatum</i>) . . .	165
44.	Four-leaved Paris (<i>Paris quadrifolia</i>) . . .	172
45.	Colchicum (<i>Colchicum autumnale</i>) . . .	173
46.	Darnel (<i>Lolium temulentum</i>) . . .	178

PRELIMINARY REMEDIES AND ANTIDOTES IN CASES OF
POISONING BY THE FOLLOWING PLANTS RECOM-
MENDED BY EMINENT PHYSICIANS.

	PAGE
Aconite, Monkshood or Wolfsbane	47
Almonds, Bitter ; and Prussic Acid	80
Belladonna, or Deadly Nightshade	122
Broom	73
Bryony	85
Buttercups, etc.	33
Christmas Rose, or Black Hellebore	43
Colchicum, or Meadow Saffron	176
Cuckoo-pint	168
Darnel	180
Dropwort, Water	94, ff.
Elder	104, 85
Ergot, a fungus	182
Fool's Parsley	89
Foxglove	138
Fungi	182
Hellebore (<i>Helleborus</i> , sp.)	43
— (<i>Veratrum</i> , sp.)	177
Hemlock (<i>Conium</i>)	92
—, Water, or Cowbane (<i>Cicuta</i>)	94
Henbane	127
Laburnum	73
Larkspur	48

	PAGE
Laudanum	55
Laurel, Common	80
Laurel, Spurge	147
Lobelia	108
Lords and Ladies	168
Meadow Saffron, or Colchicum	176
Mezereon	147
Monkshood, or Aconite	47
Morphine	55
Nightshade, Deadly	122
Oleander	134, 138
Opium	55
Oxalic Acid	64
Poppy	54
Potash, Binocalate of	65
Prickwood, or Spindle-tree	69, 138
Prussic Acid	80
Ranunculus Family	33
Savin	160
Sorrel, Common (<i>Rumex Acetosa</i>)	64
—, Wood (<i>Oxalis Acetosella</i>)	64
Spindle-tree	69, 138
Spurge, Common	154
—, Caper	154
— Laurel	147
Thorn-apple	122
Toad-stools	182
Tobacco	133
Water-Dropwort	94
— Hemlock	94
Wolfsbane, or Aconite	47
Wood-Sorrel	64
Yew	160

MR. A. W. BLYTH'S DOMESTIC READY REMEDIES FOR POISONING

MR. BLYTH strongly recommends families possessing an "Antidote Cupboard" for use in cases of emergency. This cupboard may contain—

(1) The *Multiple Antidote*, which consists of a saturated solution of sulphate of iron 100 parts, water 800, magnesia 88, animal charcoal 44 parts. It is best to have the animal charcoal and magnesia mixed together in the dry state, and kept in a well-corked bottle; when required for use, the saturated solution of sulphate of iron is mixed with eight times its bulk of water, and the mixture of charcoal and magnesia added with constant stirring. The multiple antidote may be given in wine-glassful doses, frequently repeated, in cases of poisoning by *arsenic, zinc, opium, foxglove* or *digitalis, mercury, or strychnine*. It is of no use in phosphorus poisoning, or in poisoning by the caustic alkalis or antimony.

(2) *Calcined magnesia* or any bland oil for use in poisoning by acids.

(3) *French turpentine* for poisoning by phosphorus.

(4) Powdered ipecacuanha in a well-corked bottle; the bottle containing a small pill-box, which is cut down, so that when full it contains thirty grains—the proper dose as an emetic. A similar small supply of sulphate of zinc may also be provided.

(5) A tin of mustard for emetics; and sulphate of zinc tablets.

(6) A bottle of vinegar, in cases of poison by alkalies, such as caustic soda.

If then, provided with such a supply, any member is known to have taken poison, and yet the precise poison is not known, give a *sulphate of zinc* or *ipecacuanha emetic*, and follow it up by the *multiple antidote*, which is in itself not poisonous.

In adding the remedies suggested by eminent medical men, I have quoted such, as a rule, as can be applied at once; but I have omitted what can only be left to the medical man, who should be called in as soon as possible when any accidental poisoning has occurred.

POISONOUS PLANTS

IN FIELD AND GARDEN

INTRODUCTION

THE number of children who are made more or less ill by eating berries and leaves, etc., which they find in the hedges, is undoubtedly very considerable every year; but the number of *fatal* results is probably very small. There is no doubt that mishaps might be considerably reduced if our country clergy, school-masters, and school-mistresses, knew something about wild flowers, and could distinguish between poisonous and harmless plants.

It is the object of this book to enumerate and describe such of our common wild plants, as well as some frequently cultivated, which are at all likely to prove harmful to our little ones; who are only too apt to put everything which appears attractive into their mouths.

In describing plants as "poisonous," it must be borne in mind that the word "poison" is a purely relative term; and if it seem to convey the idea of "deadliness," such is, as a rule, only applicable to it in its more concentrated form as prepared by chemists. Thus, *e. g.* children have been made ill by eating too many leaves of the common sorrel, which is perfectly harmless as a salad plant; but the pleasant acidity is due to the presence of binoxalate of potash; which, when sold as "salts of lemon" for taking out ink-stains, is a dangerous substance.

The following is the definition of a Poison as given by Mr. Alexander Wynter Blyth:—"A substance of definite chemical composition, whether mineral or organic, may be called a poison, if it is capable of being taken into any living organism, and causes, by its own inherent chemical nature, impairment or destruction of function."

The late Dr. B. W. Richardson observed that poisons are not always so bad as they are made out to be, bad as they are; and he quoted a saying from our great national dramatist, Shakespeare:—

"There is a soul of goodness in things evil,
Would man observingly distil it out."

Thus a large number of substances, which are very poisonous if taken in any quantity, become valuable medicines in the hands of skilful practitioners.

The various authorities, from whose works I have mainly compiled the present volume on British and cultivated Garden poisonous plants, are as follows: Mr. Alexander Wynter Blyth's *Old and Modern Poison Lore*, and his *Poisons, their Effects and Detection* (1895); M. Ch. Cornevin's work entitled *Des Plantes vénéneuses* (this contains all of our harmful English plants, as well as those of the Continent); Dr. Tanner's *Memoranda on Poisons* (1862); Dr. R. Hogg's *Vegetable Kingdom* (1858); and Mr. Johnson's *British Poisonous Plants* (1856).¹

It is not merely children who should be *warned against putting anything they find growing wild into their mouths*; even adults are apt to make the most stupid mistakes. Thus the garden Aconite, which no one can mistake when in flower, having long been in cultivation in cottage gardens, has been the cause of the death of whole families; because, in the limited space at the disposal of the

¹ As it was inconvenient to give repeated references in almost every paragraph, I here express my indebtedness, generally, to the authors mentioned, from whom I have borrowed freely, often quoting *verbatim*.

The illustrations are mainly from Bentham's *Handbook of the British Flora*: two, that of the Buttercup and Fool's Parsley, from my own book, *How to Study Wild Flowers* (R.T.S.), to which I would refer the reader for a more complete knowledge of the structure of our principal wild flowers than can be given in this Introduction.

cottage, a little horse-radish is also grown. In winter he digs up a root and poisons his family, having supplied them with Aconite by mistake. Or again, they collect the thick roots of the Water-Hemlock, or other harmful plant, as a substitute for parsnips ; or the leaves of the Fool's Parsley for those of the true one, etc. Such mistakes are often made with painful results to the consumer, even if they be not fatal.

These and such-like are the cases one would wish to prevent in future ; if only those who *could* do so *would* impart the knowledge to our country children ; as the late Rev. Prof. J. S. Henslow did, to the village children of Hitcham, Suffolk, more than forty years ago.¹

THE STRUCTURE OF FLOWERS.

IN order to be able to recognize poisonous herbs, shrubs, or trees, some little knowledge of the structure of flowers and fruits is necessary ; so I

¹ It would be greatly to their advantage educationally, as well as useful, if the subject of Botany were generally introduced into our schools, on the plan adopted by my father. Then, besides a general collection of all the wild flowers of the district, one of the poisonous fruits and seeds for comparison would be invaluable. But it requires some little *enthusiasm* on the part of the incumbent as well as of the school-master.

propose giving a general description, that the reader may be able to understand and recognize flowers by the peculiarities of their several parts.

Let us take some common flower as a buttercup, and dissect it. If the reader can procure a living specimen, it is desirable to do so ; but if not,

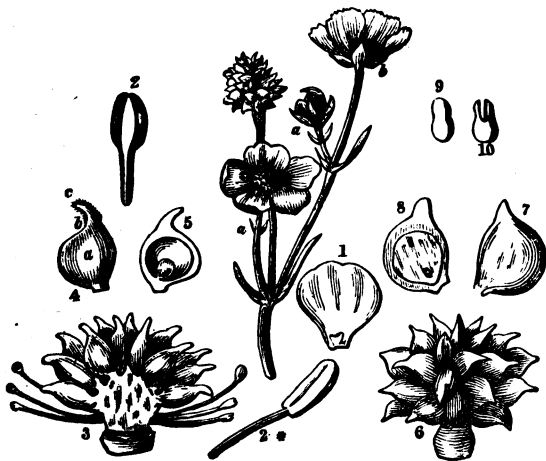


Fig. 1. *Ranunculus acris*; Field Buttercup.

I must refer him to the accompanying diagram (Fig. 1).

The flower consists of four floral *Whorls*. The two outermost are called the *Calyx*, of five free *sepals*; and the *Corolla*, of five free *petals*, each of which has a little honey-gland at the base.

The third whorl consists of numerous *Stamens*,

each of which is composed of a stalk or *filament* carrying the yellow *anther* at the top (Figs. 1 ; 2 and 2*). This consists of two cells, united back to back by the continuation of the filament, called the *connective* (shown in Fig. 2). The cells split down the edges and liberate the *pollen*, a kind of dust consisting of yellow spherical grains.

If the stamens be removed, a small globular structure will be seen left behind. This is the *Pistil*, which consists of numerous free *carpels*, making the fourth whorl (Figs. 3 and 6).

We will now refer to the illustration for more special details.

This represents the flowering top of our common field buttercup (*Ranunculus acris*), called *acris* by Linnæus because of its very acrid juice. The leaves spring up from the ground and have their blades deeply cleft into about five sharp-pointed "segments"; and then, these are again cleft. The flower-stalk is smooth and round (not fluted as in the bulbous buttercup, which flowers rather earlier than the field buttercup).

Examining a flower, it will be seen that the sepals spread out under the petals (*b*); (*a*) represents little bracts. These are rudimentary blades of leaves reduced to one or a few segments only. The petal (Fig. 1) shows the minute notched flap in front of a honey-pit. Fig. 2* is a stamen showing an anther just beginning to burst down

the right-hand edge. Fig. 2 is another stamen with both of the anther-cells open to shed the pollen. Fig. 3 is a flower in which the carpels are beginning to ripen, and from which the sepals, petals, and most of the stamens have fallen off. The *floral receptacle* is the enlarged, somewhat globular support for the parts of the flower. Fig. 4 is a carpel, (a) being the ovary, (b) the style, and (c) the stigma. Fig. 5 is the same cut vertically showing the ovule at the base of the ovary. This becomes the seed and then fills the ovary-cell completely, as shown in Fig. 8.

Fig. 6, the carpels are now ripe, making a head of *achenes*. Fig. 7 is one of them separated, and Fig. 8 is a section showing the seed cleft in half, and filling the entire chamber of the *pericarp* as the ripened carpel is now called. Its minute embryo is seen at the base embedded in *endosperm* (flour, in wheat). Figs. 9 and 10 are two views of the embryo.

We must now briefly consider the uses of these parts of a flower.

The calyx protects the rest of the flower when undeveloped in the bud.

The corolla attracts insects, which come for honey or pollen, by its bright colour.

The stamens shed the fertilizing pollen on to bees, etc., or else on to the stigma. In the former case, it is conveyed to other flowers of the

same kind; in the latter the carpels become fertilized at once.

For, as soon as a pollen-grain has fallen upon a stigma, it sends down a little tube into the ovary, and then into the ovule, by means of a little hole prepared to receive it. A fertilizing matter called the sperm-cell then unites with the germ-cell within the ovule, and the result is finally an embryo with or without endosperm; which is reserve food-material, upon which the embryo lives when it germinates until it has provided itself with true roots and green leaves.

As soon as the carpels have been fertilized, the sepals, petals, and stamens wither and fall off. The former now enlarge until they are fully matured, turn brown and then fall off. Each little carpel has now become an *achene* or fruit; while its ovule has developed into a *seed*. In this case the ovary of the carpel dries up and is called as stated the *pericarp*, and remains tightly investing the seed within it.

The next point to notice is the behaviour of the flower-stalk. This is called the Peduncle if it carries a single flower, as of a tulip, or a head of flowers or rather "florets" as they are diminutive in size, as of a daisy or dandelion. But, if each flower is borne on its own little stalk arising from the peduncle, such is called the Pedicel, as in a bunch of currants or the Lily of the Valley. In

either case the terminal part which carries all the parts of the flower is enlarged into what is called the *Floral Receptacle*. In the raspberry it forms a cone up the middle of the fruit and in the strawberry it is enormously enlarged and forms the edible structure.

But, besides the terminal enlarged part, it may spread out more or less horizontally and form a ring round the base of the flower. Such occurs in the raspberry and strawberry (Fig. 2), when it constitutes a little trough. The outer edge now carries the sepals, petals, and stamens to a little

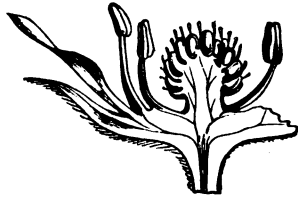


Fig. 2. Vert. sec. of flower of Strawberry.

distance away from the pistil which alone remains on the central support, as shown in the figure.

The use of this lateral expansion is the formation of the honey-secreting surface.

Yet a further growth may take place. The outer rim which carries the sepals, petals, and stamens may grow up into the form of a cup round the pistil. This is the case with the almond, cherry or peach (Fig. 3), and rose (Fig. 4). In the first three

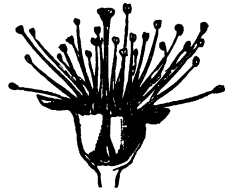


Fig. 3. Vert. sec. of flower of Peach.

named, there is only one carpel which becomes

the fruit ; but in the rose, the cup or "hep" is full of free carpels which can be picked out of this "receptacular tube," as it is called ; as may be seen in Fig. 4.



Fig. 4. Vert. sec. of flower of Rose.

Yet one more condition may exist. In the preceding cases the carpels can be removed and the cup will be left behind. But, in the case of the pear, apple (Fig. 5), gooseberry, currant (Fig. 6), etc., the receptacular tube has grown in adhesion to the carpels within it, so that it cannot now be separated.

Thus in the apple the carpels form the "core"; but the edible portion is mainly "flower-stalk," *i. e.* the adherent receptacular tube.

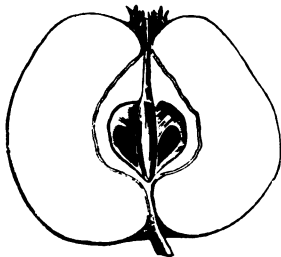


Fig. 5. Vert. sec. of Apple.

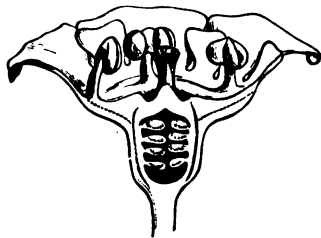


Fig. 6. Vert. sec. of flower of Currant.

As the flower *looks* as if it grew on the top of the ovary, this latter is said to be "inferior," *i. e.* "below" the flower.

“Inferior” fruits can generally be recognized by having the withered sepals and stamens on the top, as shown in Fig. 5 ; while the petals fall off. This will be recalled in the case of the gooseberry and currant, apples, pears, etc.

Cucumbers and melons, and the scarlet berry of the Bryony, however, are also inferior fruits ; but with them the whole of the flower articulates, leaving a clean scar on the top of the inferior ovary.

We must now notice another modification in flowers, and that is the *cohesion* which may take place between the parts of the whorls. In buttercups, everything is free ; but in the primrose, the five sepals are joined together ; so are the five petals into a tube ; and the globular ovary consists of five coherent carpels.

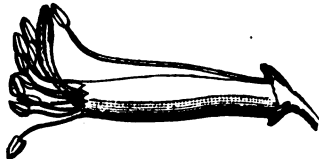


Fig. 7. Stamens of Pea ; nine coherent, one free.

In the Pea family the stamens are united by their filaments making a complete tube in Laburnum and Broom ; but with one of the ten stamens free in most others of this family (Fig. 7), in order to allow insects to get at the honey secreted within the tube ; *i. e.* by the receptacle round the base of the single carpel, the stigma of which protrudes.

Carpels, if two or more in number, are generally united. Thus there are two in Thorn-apple (Fig. 31)

and Hemlock (Fig. 22), several in the Poppy-head (Fig. 13).

The number of parts in the whorls may vary from two to six, being rarely more unless the flower be "double." Fours and fives prevail in Dicotyledons and threes in Monocotyledons; these being the two great classes which contain all flowering plants.

Lastly, any whorl may be regular or irregular; *i. e.* if the parts be all exactly alike, or with some of them unlike. Thus in a Buttercup (Fig. 1) and Primrose every whorl is regular; but in the Larkspur and Aconite (Fig. 12) the sepals are irregular, and in all members of the Foxglove family as well as that of the Labiates—not referred to in this book as they contain no poisonous plant—the corolla is irregular, as seen in the common Dead-nettle and Sage.

CLASSIFICATION.

BEFORE discussing individual poisonous plants, we must consider on what principles they are arranged; to do this we can follow the lines of historical botany; for, at first, as a general rule, every plant was known by a single name; but it was early observed that in many cases there were obviously plants so much alike that they all had to be called by the same name; but, at the same

time, there were as obviously certain differences, so that a second name was given to each. Thus a medical botanist who wrote in the tenth century (and others before him) speaks of *Aristolochia clematis*, *A. longa*, and *A. rotunda*, the two latter terms referring to the shape of the root. Another writer in the fifteenth century says of *Titimallus* (which we now call *Euphorbia*), there are many "species."

As more and more plants came to be studied for their real or supposed medicinal virtues, more words were required to distinguish certain plants, till their titles became most cumbersome.

It was Linnæus who, in the eighteenth century, based his system of classification by fixing *two* names to *every* plant; the first being the "generic" name, the second the "specific."

He made use of the old names, sometimes retaining them as the *genus*, as *Senecio* (the groundsel), and adding *vulgaris*, because it is so common. In other cases he used the old name as the species. When this was the case, it is spelt with an initial capital letter, as *Ranunculus Flammula* and *Solanum Dulcamara*. To other species, which had no special names, Linnæus supplied them, as *Ranunculus bulbosus* and *R. repens* (from the forms of the stems), *R. acris* (from its acidity), and *R. aquatilis* (from its living in water), etc.

When it was found that many plants, which no

one would call buttercups, had yet a very close similarity to them in the structure of their flowers—as Anemones, which agree with buttercups in having many stamens and many carpels; but the corolla is wanting, and the calyx is coloured or white—then this formed a genus side by side with *Ranunculus*, containing several species also.

So botanists grouped together a number of genera, all more or less agreeing with buttercups, yet at the same time possessing differences which prevent their being entitled to be called such.

Collectively, the *genera* constitute a Family, or as Botanists call it a “Natural Order.”

Botanists next proceed to arrange the families in a certain sequence, in accordance with the various points of structure already explained, as follows:—

First.—All families with *free* petals and *no* lateral expansion of the floral receptacle, or receptacular tube.

Second.—All families with *free* petals, but possessing a receptacular expansion or tube of some form or other.

Third.—All families with *coherent* petals.

Fourth.—Plants having incomplete flowers, *i. e.* having, as a rule, no petals at all.

Then follows a group which is only represented in the British Isles by three trees or shrubs—the Scotch Fir, the common Juniper, and the Yew.

Their peculiarity is that they have only stamens and ovules. There is no calyx or corolla, and *no pistil*; so that the ovules are naked. Hence the group is called *Gymnosperms*.

All the preceding constitute the class *Dicotyledons*.

There remain three more groups of Families.

First.—All plants with a *perianth* instead of a calyx and corolla. This word is used because the parts of these two whorls are more or less alike and “petaloid,” *i. e.* of the nature and appearance of petals. These form two groups, *viz.*—Those with an *inferior* ovary, and, therefore, a *superior* perianth, as the Daffodil; those with a *superior* ovary, and, therefore, an *inferior* perianth, as the Colchicum.

Lastly come those families which have their stamens and pistil protected by chaff-scales called “glumes.” Such are the Sedges and Grasses. The only one alluded to in this book is a grass occurring in cornfields, called the Darnel.

All the preceding are included under the class *Monocotyledons*.

The two classes derive their names from the fact that the embryo in the seed of dicotyledons has two seed-leaves or cotyledons, and that of monocotyledons has only one.

Everybody is familiar with almonds, beans, peas, and acorns, which readily separate into two halves, but are united to a little bud at one side

or edge. They are represented in the tiny embryo of the Buttercup (Figs. 1; 9, 10; p. 17). When such seeds germinate, the two cotyledons often come above ground and turn green, as in mustard and cress.

In germinating onions, a single leaf comes up at first. This is the one cotyledon, as they belong to the Lily family, which is a monocotyledonous group.

These two Classes, are, however, known by a collection of characters, and not only by their embryos.

Thus, when a seed germinates, as of a carrot or parsnip, it develops an axial or tap-root, if it be a dicotyledon. In monocotyledons this is always arrested and secondary roots issue from the stem.

Again, the stem of a dicotyledon, if woody, has concentric cylinders of wood, one being formed every year; so they appear as rings in a transverse section of any of our timber-trees or shrubs, which thus reveal the age of the tree.

In a monocotyledon the wood is broken up into isolated cords running anywhere through a mass of soft tissue. Such is easily observed in a stick of asparagus.

The leaves of all our trees and shrubs have a reticulated "venation"; *i.e.* the woody framework upon which the green tissue is spread out forms a sort of network.

In monocotyledons, as seen in a blade of grass if held up to the light, the cords run parallel to one another, from end to end.

In the flowers, the parts of the whorls are usually multiples of 2 and 5 in dicotyledons, and of 3 in monocotyledons.

The above distinctions are not without exceptions. Thus the leaves of Lords and Ladies (*Arum maculatum* (Fig. 43), and of Paris (Fig. 44), though belonging to the monocotyledons, have net-veined foliage.

The stem of the Butcher's Broom (*Ruscus aculeatus*) is woody, but the structure is that of a monocotyledonous stem, since it belongs to the Lily family, as does also Paris.

Lastly, the Lesser Celandine (*Ranunculus Ficaria*) has only one cotyledon.

The Water-crowfoot (*Ranunculus aquatilis*) has the tap-root generally arrested, as is the universal rule in monocotyledons, though the genus *Ranunculus* is a dicotyledon.

CLASS I
DICOTYLEDONS

DIVISION I

PETALS, FREE ; WITHOUT ANY RECEPTACULAR
EXPANSION

BUTTERCUP FAMILY (*Ranunculaceæ*).—The commonest plants of this family are Traveller's Joy, Wood Anemone, Buttercups, Water-crowfoot, Marsh Marigold, Hellebores, Columbine, Winter Aconite, Larkspur, and Aconite.¹

A poisonous acrid and narcotic principle prevails in varying degrees in all the members of this family. The Water-crowfoot (*Ranunculus aquatilis*) appears

¹ Rarer wild plants, and some cultivated, are the following :—Meadow-rue, Pasque-flower (*Anemone*), Pheasant's-eye, Mouse-tail, Globe-flower, Bane-berry (*Actæa*), Peony, Love-in-a-mist, and Christmas-rose (*Helleborus*). The chief characters of the flowers are to have every part of them perfectly *free*, with many stamens, and either many carpels ripening into seed-like "achenes," or a few only, becoming pods or "follicles."

however to be free from it ; or it is so attenuated that the plant is collected from the rivers and given to horses and cattle in some parts of the midland counties.

The principle is volatile, so that it is easily destroyed by drying, or boiling, and even pickling, as vinegar renders the plant harmless. The roots as a rule are the most energetic ; but even the petals of buttercups, and especially of the Aconite, are deleterious if put into the mouth and masticated.

The members of this Order most likely to cause trouble are the following :—

TRAVELLER'S JOY, or OLD MAN'S BEARD (*Clematis Vitalba*).—The first English name was given to it by Gerard in 1597. He thus writes in his *Herball* :—" It is called commonly *Viorna quasi vias ornans*, of decking and adorning waies and hedges, where people trauell, and thereupon I haue named it the Trauveilers Ioie." The second name is given to it because of its white, wool-like mass of feathery achenes when ripe in autumn (see Fig. 8).

The plant has compound leaves of two pairs, and one single leaflet as shown in the figure. Their stalks are extremely sensitive to touch ; so that they twine round anything they happen to meet and support the plant.

The flower has four sepals, no corolla, many

stamens, and many carpels, the styles of which elongate and are hairy in fruit.



Fig. 8. *Clematis Vitalba*; Traveller's Joy.

It has all its parts poisonous. Tramps some-

times raise sores on their arms by means of the juice of this plant rubbed into scratches, as well as that of some species of *Ranunculus*, in order to excite commiseration. The juice is, as in all other species, acrid and narcotic, but the poison is readily dissipated by heat. If the fresh leaves be chewed, there will be felt in the mouth a sensation of heat and smarting, and the tongue will be covered with small vesicles, which turn to ulcers. If swallowed, the juice or extract produces all the symptoms of poisoning by the acrid poisons. In early spring before it is much developed, asses and goats have eaten the young shoots with impunity. They are also eaten pickled in vinegar in some countries; taken internally in a more harmful quantity, they act as a diuretic, and are violently purgative, producing dysentery, and can in rare cases cause death.¹

ANEMONE (*Anemone*, sp.).—Only two species represent this genus in England.

PASQUE-FLOWER (*Anemone Pulsatilla*).—This has a thick and somewhat woody rootstock, from which much-dissected leaves arise, covered with silky hairs, more especially when young. The

¹ The best antidotes, as given by Dr. Brunton, are first endeavouring to empty the stomach by means of emetics; then the use of spirits, or ammonia, and warmth. Other remedies, as Digitalis and Atropine, must be left to the physician. The preceding apply to Aconite-poisoning; but the poison of the whole Family appears to be of the same kind.

flower is borne on a peduncle, five to eight inches in length, carrying an involucre of three sessile, deeply-cut bracts. The flowers have six sepals of a dull violet-purple colour, very silky externally; the carpels when ripe have their styles converted into long feathery tails, like those of the Traveller's Joy (*Clematis Vitalba*).

WOOD-ANEMONE (*A. nemorosa*).—This has a long, creeping rootstock. The involucre consists of three complete leaves. The flower has six white or rosy-coloured sepals; the carpels become tailless achenes like those of the buttercup.

All species are harmful, and several are cultivated, such as *A. coronaria* and *A. hortensis* from South Europe, *A. japonica* from Japan, etc. The leaves and sepals, etc., should not be put into the mouth. The toxic principle has been extracted from three species: the two here described, and one foreign one. No fatal results have been recorded.

A foreign species (*A. ranunculoides*) is used in Kamtschatka for poisoning arrows.

In France, swelling and blistering of the hands has resulted from using the juice as a stimulant to ulcerations, etc.

Cattle have been poisoned by their eating the Wood-anemone in the fresh state, after having been underfed and kept on dry food during the winter; when they become less discriminating and ready to eat any fresh green food.

BUTTERCUP (*Ranunculus*, sp.¹).—The deleterious principle is common to nearly all kinds of *Ranunculus*, and varies very much in strength; the most acrid are *R. bulbosus*, *R. acris*, *R. sceleratus*, *R. Flammula*, *R. auricomus*, *R. arvensis*, and a foreign species, *R. thora*.

The Water-crowfoot and its numerous varieties or species, according to different botanists, appear to be the least harmful, as cattle eat it with impunity; in the neighbourhood of Kingswood, on the borders of the Avon, cottagers used to support their cattle almost entirely on this species of Crowfoot. It is said that one man kept four cows and one horse so much upon it that they had not consumed more than half a ton of hay throughout the whole year. They collected a quantity every morning and brought it in a boat to the edge of the water, where the cows ate it with great avidity.

It is no doubt due to being submerged that the deleterious property is not produced in this species.

CELERY-LEAVED RANUNCULUS (*R. sceleratus*, Fig. 9).—This is an annual plant common in ditches; varying in height from a few inches to several feet.²

¹ For description of the Buttercup (*R. acris*) see the Introduction.

² I collected a tiny variety, about two inches in height, on ground occasionally flooded, close to the Great Pyramid.

It has smooth divided leaves and very small flowers, and small oblong masses of minute achenes (Fig. 9). It was formerly used medicinally ; but as accidents happened, it has been discarded by modern practitioners. The juice acts as an irritant on the skin. As heat dispels the poison, the poor have been known to eat the young shoots when boiled. The leaves, as of several of the Umbellifers



Fig. 9. *Ranunculus sceleratus* ; Celery-leaved Ranunculus.

which resemble parsley or celery, have been eaten as such with harmful results. Cattle have even died in consequence of the species having been mixed up in miscellaneous herbage as fodder.

BULBOUS RANUNCULUS (*R. bulbosus*) and FIELD BUTTERCUP (*R. acris*, Fig. 1), so named by Linnæus for its acidity, are equally common in meadows ; the former flowering first, and then followed by the latter.

These Common Buttercups have very powerful and acrid properties; and their *fruits, when green*, appear to be the parts in which this acidity is most intense.

Taken internally, the juice or extract of *R. acris* causes an intense inflammation of the digestive organs; and if the quantity has been considerable it acts as a true acrid poison, followed by very serious results, and it may be, even death.

A slice of the corm of *R. bulbosus* is used as a popular remedy for toothache. It is most charged with acidity when the plant is full-grown, before being cut down for hay. As drying dissipates the deleterious principle, although horses and cows never touch buttercups in full leaf or in flower, yet they eat them when dried in hay without any injurious result. They, in fact, then form nourishing food.

Though the Field Buttercups have an acrid juice which sometimes irritates the hands, if the juicy, bruised stems be grasped too strongly, especially in hot weather, yet it is those which frequent marshes, or the margins of ponds and ditches, which are more deleterious. It is rarely that any one has been poisoned; but a medical man records the fact of a young lady aged fifteen, who, after having chewed the stems and flowers of the bulbous buttercup, and sucked the juice, suffered severely for over a week, exhibiting all the symptoms of acrid poisoning and delirium.

Another curious case occurred in America. Specimens of the Field Buttercup (*R. acris*) had been preserved in spirits of wine for more than a year. They were subsequently given to a class of students in the University of Pennsylvania. A day or two afterwards an intense itching sensation was felt by all who handled them ; while the skin between the fingers became red and covered with minute pustules. The acrid juice had evidently been extracted ; and when the alcohol had evaporated, it was left on the hands.

The petals as well as the half-ripe green fruits appear to be the most acrid ; so that children who persist in putting everything into their mouths should be warned. If the fresh-bruised leaves be applied to the skin, a more or less active inflammation will follow, forming a true blister. Recourse was formerly had to this method in Norway and Scotland, where true cantharides was not procurable.

SPEAR-WORT (*R. Flammula*, Fig. 10).—This is a common species in wet places, often growing actually in the water. It has long, narrow, and pointed leaves with a toothed margin. It is a very acrid species.

The attention of farmers should be called to this species of *Ranunculus*, because it has repeatedly killed horses and cows which have eaten it, as it is often very abundant in boggy parts of

meadows. Such mishaps occurred, for example, in the village of Gamlingay in Cambridgeshire. It



Fig. 10. *Ranunculus Flammula*; Spear-wort.

is easily recognized as having a flower like that of a common buttercup, only smaller, being about half-an-inch in diameter when fully expanded. Moreover its foliage is very different from that of any field buttercup.

LESSER CELANDINE (*R. Ficaria*).—This species differs from other buttercups in having heart-shaped, smooth leaves, a corolla of several (about seven or eight) petals and only three sepals. It is a familiar plant, flowering in early spring. It is scarcely poisonous when young, for in Germany the roots are eaten as a salad; but later it becomes so. Heifers have been poisoned by it.

It is to be noted that the strength of the acrid principle varies according to locality and season.

Thus early in spring it is scarcely developed, but increases with the growth of the plant, and is strongest at the period of flowering, decreasing subsequently.

It is said that wood-pigeons eat the club-shaped roots with great avidity, and its growth is sometimes encouraged in the vicinity of gardens to prevent their depredations in winter.

MARSH MARIGOLD (*Caltha palustris*) is a familiar plant, with round leaves, and large, golden-coloured flowers. It has really no corolla, for the calyx has become coloured in lieu of it. There are numerous stamens and many carpels. Unlike buttercups, these are many-ovuled and become pod-like "follicles," distinguishable from pea-pods or "legumes" by bursting down one edge only; whereas a legume breaks into two valves.

It resembles the buttercups in its noxious principle; as with them its acidity increases with age. All animals refuse it, and they have only suffered when the plant has been carelessly mixed with forage.

It is stated that kine have eaten the Marsh Marigold, and died from the inflammation caused by it. In some parts of Germany the young buds are pickled like capers.

A species of *Caltha* in Nepal is used for poisoning darts; also for poisoning wells to stop the invasion of enemies,

A curious case is recorded of a large quantity of the flowers of this plant being in a room with a girl subject to fits, and that the gaseous exhalation caused these to cease. This, however, seems to need confirmation.

HELLEBORE (*Helleborus*, sp.).—The two British



Fig. 11. *Helleborus foetidus*; Fetid Hellebore.

species, the Green and the Fetid¹ (*H. viridis* and *H. foetidus*, Fig. 11), are found sparingly in several counties. The leaves have long stalks with a divided blade and toothed segments. The flowers have a green calyx of five large sepals, spreading in the Green, but erect and overlapping one another

¹ This species is also called Bear's-foot, Setterwort and Helleboraster.

in the Fetid Hellebore. The corolla is wanting, but represented by a number of little honey-tubes. There are many stamens and about three carpels, which become pod-like follicles when ripe.

Both of our native species are powerfully cathartic, and so acquired an early reputation as remedies for certain complaints. Irregular practitioners have employed them with fatal results, issuing from violent internal inflammation. Thus a child died after taking two dessert-spoonfuls of the infusion of the Fetid Hellebore.

Several cases are known of adults having been poisoned by taking it as a cathartic medicine.

Besides human beings, cows have died from eating the trimmings of the Fetid Hellebore mixed with other herbage when thrown out from a shrubbery into the field where they were.

CHRISTMAS-ROSE (*H. niger*) has long been cultivated as a garden plant, and was formerly used medicinally; but it has been discarded from the Pharmacopœia as too uncertain and dangerous in its action. Human beings have only been injured by the ill-advised and careless use of the plant as a drug, especially by unqualified practitioners. The roots are said to possess the greatest activity; but the leaves are also poisonous when used in the form of an infusion. Half-a-drachm of the aqueous extract killed a man aged fifty in eight hours.

Numerous other cases besides the above, taken

from Dr. Taylor's work, are recorded; so that since the green part of the Hellebores are very dangerous, neither they, nor the flowers, which are also green, should ever be put into the mouth.¹

ACONITE (*Aconitum Napellus*, Fig. 12).—The Aconite has deeply divided leaves with tall spikes



Fig. 12. *Aconitum Napellus*; Aconite.

of deep blue to white flowers in cultivation, easily recognizable by one sepal of the blue calyx being in the form of a hood. The two petals are like crosiers, and converted into nectaries. The numerous

¹ Dr. Tanner recommends for poisoning by *Hellebore*, emetics, purgatives, and stimulants, as the best means to prevent fatal results from these as well as from many other vegetable poisons.

stamens are pendulous at first, but rise up in succession, placing the anther forward, so that when visited by humble-bees they readily get dusted with pollen.

The root is spindle-shaped—pale-coloured when young, but acquiring a dark brown skin subsequently.

It was well known to the ancients as deadly poisonous, and was fabled as the invention of Hecate from the foam of Cerberus. It was the poison used in the island of Ceos, where all who were of no use to the State were poisoned. Old men were thus disposed of.

As all parts of the plant are deleterious, it is most important to caution people from chewing either the leaves or flowers, as a sensation of numbness will be felt in the mouth for some hours. If a larger quantity than will only cause this be taken internally, great burning will be occasioned, followed by tremors.

The taste is bitter, though at first rather sweet, followed soon by a burning sensation, accompanied by great salivation. So acrid is the poison, that the juice applied to a wounded finger affected the whole system : not only causing pains in the limbs, but a sense of suffocation and syncope.

Linnæus says that the Aconite is fatal to kine and goats when they eat it fresh ; but that when dried it does no harm to horses. In this respect it

agrees with buttercups. He relates in the Stockholm Acts that an ignorant surgeon having prescribed the leaves, on his patient refusing to take them, took a dose himself, and died in consequence.

It is curious that a similar occurrence has been recorded, of a person who, having eaten some leaves of Aconite, became maniacal ; and when a surgeon was called in, he denied that the plant was the cause of his delirium ; so he ate freely of the leaves himself, and exhibited also all the symptoms of mania.

Aconite poisoning of wells by a virulent Indian species (*A. ferox*) has been carried out by native Indians to stop the progress of an army, as in the case of the Nepal war ; but it was discovered in time. They also use it for poisoning spears, darts, and arrows, and for destroying tigers ; two and a half grains of the extract are sufficient to kill a strong dog.

Besides the root, the leaves have been eaten as a salad with fatal results.

The whole plant is so dangerous that cottagers who have but a limited space for their vegetables and flowers should be advised never to grow it ; or if they have it, to eject at once and burn any plants of Aconite there may be.

All children should be especially warned against the Aconite, when in gardens ; and told never to put bits of leaves or petals in their mouths.

Though cultivation somewhat reduces the noxious properties, it does so to so slight a degree that many families have been poisoned by eating the root in mistake for horse-radish. It is difficult to conceive how the mistake arose at first ; but it has been suggested that after scraping a root of horse-radish to a point, it has been replaced in the ground ; since having a crown-bud at the top, it would grow again. Subsequently a root of aconite was presumably taken up, under the impression it was the former scraped root, which had acquired a similar pointed shape.

At all events, the Aconite should never be grown among kitchen herbs of any sort, even if it be planted for its flowers in a herbaceous border.

Aconite has a root which is (1) *conical* and tapering to a point. (2) It is externally of an *earthy-brown* colour ; (3) white internally, and of an (4) *earthy smell*. It has at first (5) a bitter taste ; but soon afterwards (6) it leaves a disagreeable tingling and numbness.

Horse-radish root is (1) long, *cylindrical*, or nearly so, and of the same thickness for many inches. (2) It is externally *whitish-yellow* ; (3) and also internally ; but it has a (4) *pungent odour* when scraped. Its taste is (5) sometimes bitter ; but it produces an (6) immediate pungent sensation.

It is difficult to understand how the root of

Aconite could be taken for that of Horse-radish, if even the slightest attention had been paid to the root when dug up. But this was precisely what was wanting.¹

COLUMBINE (*Aquilegia vulgaris*).—This has true compound leaves. The segments of a divided leaf when perfectly free from each other, give rise to a compound leaf. Such is the case in the Traveller's Joy and the Columbine. The flowers have five coloured sepals and five petals, each being prolonged into a honey-secreting spur. It has numerous stamens, and five carpels which become many-seeded follicles.

The name is derived from *Columba*, a dove ; for the flower has some resemblance to five little birds putting their beaks together, the sepals forming the wings.

Like the Aconite, this is not common wild ; but

¹ The following are Dr. Tanner's remedies for poisoning by *Aconite* :—In addition to emetics, castor-oil, and animal charcoal, benefit may be derived from administering strong coffee. Brandy or ammonia should also be given, while the limbs and back are well rubbed with hot towels. Artificial respiration might prove useful.

Dr. Brunton adds :—Spirits ; ammonia ; warmth ; digitalis ; atropine.

Mr. Blyth's treatment for poisoning by *Aconite*.—In the absence of a physician, for whom his directions are especially given, the only item which an attendant to the patient can apply, would be an emetic ; he suggests sulphate of zinc, and to keep the patient in a recumbent position.

it has long been grown as a garden plant. The whole plant is harmful, but the seeds are the most dangerous. Linnæus states that a tincture made from the flowers, when given internally to children, has proved fatal.

LARKSPUR (*Delphinium*, sp.).—This is not common wild, though it occurs as a cornfield weed about Cambridge, in Sussex, etc. Several species are cultivated as garden plants.

Two species are recognized as more or less wild, one called *D. Consolida*, as under the name "*Consolida*" it was used as a drug for healing or consolidating wounds. The other is called *D. Ajacis*, because it has marks on the petals resembling the letters AIAI. This is the one usually cultivated as an annual in our gardens.

Like the Aconite the Larkspur has a coloured calyx, one sepal being prolonged into the spur behind, suggesting the English name. Within this sepal are two petals also spurred, and secreting honey, which is stored in the spur of the sepal.

The seeds of the Larkspurs are especially dangerous; so that it should be carefully separated from wheat before grinding. They cause vomiting and purging if eaten. Children should be warned against putting any part of these plants into their mouths.¹

¹ Dr. Tanner recommends for poisoning by Stavesacre (*Delphinium staphisagria*), a medicinal species of Larkspur,

BANE BERRY (*Actæa spicata*).—This is a rare British plant, only known wild in northern England. It has large compound leaves; the leaflets three-lobed and toothed. The flowering stem grows from one to two feet high. The flowers very small, nearly white. It has a calyx of four small petal-like sepals, four very small petals, numerous stamens, and one carpel which becomes a berry, nearly black in colour.

It is the berry which might attract children, but it is very poisonous; as well, indeed, as are all other parts of the plant. Drying only partly destroys the poisonous principle. However, it exhales so disagreeable an odour, that poisoning by it has been extremely rare.

LOVE-IN-A-MIST, or DEVIL-IN-A-BUSH (*Nigella damascena*), is an old-fashioned garden flower. It has finely-divided leaves. The flower is solitary, terminal, usually blue, surrounded by a finely-divided leafy involucre forming the "mist" or "bush." The sepals are five, coloured, and resemble petals. The petals are small, and cleft, stamens many, and carpels varying in number from three to ten. Unlike all other members of this family, the carpels are coherent into a large capsule. The seeds are black, and have given the name from the Latin word

—emetics, linseed-tea, or gum-water, or gruel copiously administered. The warm bath will afford great relief. *Oil* must be *avoided*.

niger. These seeds have a certain piquant and acrid flavour. They are the "fitches" of Scripture, and are still used in Germany and the East for seasoning dishes, or cakes, on which they are sprinkled, as we do with caraway-seeds.

The remaining and less common members of the Buttercup family (*Ranunculaceæ*), whether wild or cultivated, are all more or less poisonous, so that it will not be necessary to add further remarks, except to warn parents and guardians, and all who have the charge of children, to see that they never put anything growing wild in their mouths, nor anything cultivated in the flower-garden.

POPPY FAMILY (*Papaveraceæ*).—We have four indigenous poppies, and the Opium poppy as an occasional escape (Fig. 13). They are cornfield weeds with rough, divided leaves and scarlet flowers. The calyx has only two sepals, which fall off as the bud opens; four free petals, numerous stamens with purple-black anthers, and a pistil of several coherent carpels. There is no style, so that the crown-like stigma rests on the ovary; which, when ripened into a capsule, bursts by pores at the summit, under the edges of the stigmatic crown.

They are all characterized by having a milky juice, which when coagulated constitutes crude opium. It is acrid and narcotic.

OPIUM POPPY (*Papaver somniferum*).—Unlike the wild poppies, this has a smooth stem and foliage.

It has been in cultivation for many centuries. Gerarde figures both single and double kinds in his *Herball*, 1597. It is believed to be a cultivated variety of the S. European species, *P. setigerum*.

Dr. Hogg gives the following account of the extraction of opium. He says the manner in which



Fig. 23. *Papaver somniferum* ; Opium Poppy.

opium is obtained is still the same as that practised in the East centuries before the time of our Saviour.¹ A few days after the fall of the flower, men and women proceed to the fields at sunset, and make horizontal incisions in the poppy-heads,

¹ The "gall" of Scripture, a translation of *Rosh*, meaning "head," appears to have been opium.

or capsules, when still unripe, taking care not to cut so deep as to penetrate their cavity. The white juice exudes, and appears in the form of tears, on the edges of the incisions; and the night dews favour the exudation of the juice. The field is left in this state for twenty-four hours, after which the juice is scraped off with a small iron scoop or a blunt knife. The operation is never performed more than once on each head. The inspissated juice is then formed into cakes, ready for the market.

The petals contain the milky juice, so should not be put in the mouth. The seeds, of which there are two kinds, white-skinned, and dark or black-skinned, contain much oil, and have no, or at least a very small trace of opium. They are eaten in some parts of Europe, being made into cakes or strewed upon bread, or in sugar. It is said that the ancients rolled them up in their bread to excite an appetite. Virgil speaks of the poppy as *cereale papaver*, probably as the wild form (*P. setigerum*) is a cornfield plant. Ceres is always represented as crowned with poppies. Poppy-seed is also given to singing-birds, as "Maw-seed" when they are moulting. The cake after the oil is expressed is a food for cattle. In 1700, when the olive crop failed, poppy-seed oil was found to be a good substitute. The seeds are usually regarded as quite harmless; but there is little doubt that they *do*

contain a certain amount of opium, for cases have been recorded of poisoning by the seeds only of the poppy.

The most harmful application of opium is for intoxicating purposes ; as by orientals in smoking it ; but the terrible abuse of morphine (contained in opium) is the practice of taking hypodermic injections, and is quite as bad.

Laudanum, as prepared from opium, is, of course, a most deadly drug, and can only be used with the greatest caution.

There are, unfortunately, several ways in which mothers are accustomed to quiet their infants ; as by "cordials," "soothing syrups," decoctions of poppy-heads, etc., all of which contain a certain amount of stupefying opium, and have frequently proved fatal. "Poppy-heads," or the dried capsules, retain the poisonous principle, and numerous cases are on record of infants dying from the administration of an infusion made from them by their parents, who are, of course, totally ignorant of the *strength* of the infusion given. Thus, one or two teaspoonfuls of the water in which a poppy-head had been boiled, proved fatal to two children in eight hours.

"Syrup of Poppies" as sold by the chemists is equally dangerous. It is believed to be a mixture of the tincture or infusion of opium with simple syrup, and, as Dr. Taylor observes, is of *variable*

strength, which accounts for children being poisoned by what was supposed to be a legitimate medicinal dose. Mr. Blyth records among the number of deaths by poisoning during the ten years ending 1892, no less than 1379 by opium, including laudanum, morphia, etc., and 45 by mixtures called Soothing Syrup, Paregoric, etc.

FIELD POPPY (*P. Rhæas*).—We have four wild species of poppy, all with red flowers, and easily recognized; they all contain the same milky juice, and their smell and taste is so disagreeable that cattle refuse them. They have, however, been occasionally injured by eating unripe poppy-heads when the plant was mixed with clover and sainfoin.

The only use of the wild poppy is for the colouring matter in the petals. Theocritus records a custom among young Greeks, who took the petals probably folded into a little bag, as boys do with rose-leaves now, and holding it between the finger and thumb of the left hand, gave it a sharp tap with the palm of the right hand. If it cracked, it was a proof that their sweetheart loved them. In his third *Idyllium* the goat-herd tells Amaryllis that his “telephion,” as he calls it, would not crack.¹

¹ As antidotes to poisoning by Morphia, Mr. L. Brunton gives the following:—Warm coffee after the stomach is emptied. Ammonia. Arouse by flicking with a towel, or by galvanic battery, and keep awake by walking about and renewal of stimulation if necessary; two to four mins. liq.

HORNED POPPY (*Glaucium luteum*).—This is a handsome plant, common on our sea-shores, with large yellow flowers and juicy, bluish-green leaves, and very long pods suggesting the name.

atropiæ subcutaneously. Artificial respiration if necessary. Dr. Tanner adds the following recommendation :—All the poison must be removed if possible by the stomach-pump. In the absence of this instrument, emetics of half-a-drachm of sulphate of zinc, or a table-spoonful of mustard, must be employed. *The patient must be prevented from going to sleep*; as by dashing cold water over his head and chest, walking up and down between two persons in the open air, electro-magnetic shocks to the spine, and administering strong coffee.

For poisoning by *Opium, Morphine, Laudanum, etc.*, Mr. Blyth writes as follows :—If taken by the mouth, give at once a solution of potassium permanganate, and then empty the stomach by the pump; but, if it have been taken by hypodermic injection, both these would be useless. The stomach in opium-poisoning is best relieved by the pump or tube, and should then be well washed out with hot coffee, leaving in the organ a pint or more. If the stomach-pump be not at hand, a dose of mustard or zinc sulphate may be given; but there may be a difficulty in obtaining vomiting from any emetic.

Attempt to rouse the patient by the battery, if at hand, by flips with the towel, and by shaking.

The usual direction given is to make the patient walk about; but this treatment is questionable, and likely to favour the toxic action of morphine on the heart.

Ammonia may be applied to the nostrils. Hot coffee introduced by an enema. The alternate cold and hot douche to the head is good, but the body should be kept warm with hot wraps. If necessary apply artificial respiration.

Nothing is known of any injurious effects having taken place ; but they would probably be much the same as in the following.

CELANDINE (*Chelidonium majus*, Fig. 14).—This



Fig. 14. *Chelidonium majus* ; Celandine.

is common in hedges about villages, and in stony places. It has much-divided leaves, small four-petalled yellow flowers and long pods ; the seeds having a small crest-like appendage.

Having been an old medicinal drug-plant of the

Middle Ages, it was probably introduced and has become a naturalized plant in Britain.

It exhales a disagreeable odour. The acrid juice is still used in the country as a cure for warts and parasites ; or as an emetic and purgative, but not without harmful results ; for it acts as a strong irritant, not only to the external skin, but especially upon the intestinal digestive organs, producing nausea and dysentery. It is in fact a "drastic purgative." A peculiarity lies in the fact that the poisonous principle remains long in the system ; so that domestic animals poisoned by it should not be eaten.

The plant used to be called Swallow-wort ; "not," as Gerarde wrote in his *Herball* (1597), "because it first springeth at the coming in of the swallows, or dieth when they go away—for it may be found all the year ; but because some hold opinion, that with this herb the dams restore sight to their young ones when their eyes be out ; which things are vain and false."

The VIOLET FAMILY (*Violaceæ*), VIOLET (*Viola*, sp.).—Seven species represent this family in Britain.

SWEET VIOLET (*V. odorata*).—The flowers are dried and crystallized in sugar ; but are also used medicinally as a "pectoral." The seeds and underground stem or rhizome are poisonous. If taken internally these parts incite nausea and great

vomiting and nervous affections. This is due to an alkaloid with pronounced emetic qualities. The sweet scent of the flowers is correlated with deleterious principles in the stem, for these are greatly reduced in the scentless species of *Viola*, including the Pansy. This is used in America in the form of an ointment, and internally for bronchitis.

The seeds are injurious, being sometimes prescribed as a purgative.

A foreign genus *Ionidium*, has the same principles as *Ipecacuanha*, which belongs to the *Galium*, or Coffee Family.

PINK FAMILY (*Caryophyllaceæ*).—This large family includes all the pinks and carnations, catchflies, stitchwort, as well as numerous little humble weeds with inconspicuous flowers, as chickweed, spurry, sandworts, etc. It is generally credited as being perfectly innocuous, but three plants call for attention.

CORN-COCKLE (*Agrostemma Githago*, Fig. 15).—This is a common cornfield weed, a tall and erect annual, with opposite pairs of long narrow leaves. The flowers have long peduncles. The calyx has its sepals coherent with long leaf-like terminations. The five petals are free, with tapering stalks, called "claws." There are ten stamens. There is a short space or internode between the insertion of the calyx and the rest of the flower. The pistil consists of five carpels, of which the ovaries are coherent,

but not the styles and stigmas (see the figure). The fruit is a capsule opening by five teeth, and has numerous dark-coloured seeds.

As the seeds are shed simultaneously with the corn, they are apt to communicate injurious pro-



Fig. 15. *Agrostemma Githago*; Corn-cockle.

perties to the flour. They have no scent, but are bitter to the taste.

As the seed-skin is black, and when ground up the fragments remain, the presence of the seeds can be thereby detected. Moreover the starch grains are exceedingly small as compared with

the round grains of starch of wheat. As the black fragments are removed by fine sifting or bolting, the flour should be carefully examined, before grinding. But it imparts a greyish tint and disagreeable odour, even to bread when baked. Again, the fine-grained starch does not so readily give the blue or violet colour with iodine. This test has been used with success, as also to estimate the quantity of the deleterious grain present. There are also several other useful tests.

No animal will eat the plant, and all mishaps recorded resulted from the seeds in bread as far as man is concerned, for the heat of baking does not destroy the injurious quality.

Accidents with animals have occurred by feeding them with the so-called "thirds" and siftings. No less than forty-five per cent. of the meal of corn-cockle has been found in fraudulent food for cattle on the Continent. Two and a half per thousand in weight is sufficient to kill a calf and a fowl, but only one per thousand a pig.¹ The active principle acts as an irritant, and with local inflammation, giving rise to diarrhoea within, and, if injected hypodermically, serious inflammation. A substance of the same nature as that of the Soapwort and

¹ Cornevin's system is to calculate the number of grammes of the poison, and one thousand (or one kilogram) of the live animal's weight.

called *Saponine* occurs, but this is not the toxic substance (not yet traced). At all events it is a plant which no cultivator should allow among or near his cornfields, and the grains should be carefully separated before threshing and grinding the corn.

SOAPWORT (*Saponaria officinalis*).—This plant was used as a drug in the Middle Ages, and was naturalized before the close of the sixteenth century. The name is derived from the fact that if the root and flowers be rubbed in water they make a lather, and these were used as a substitute for soap in former days. As a drug it was one of the fifty-one ingredients of "save," a drink for broken bones, mentioned by Chaucer. A case of ill effects of the use of a decoction of the roots has been recorded. The principle is called Saponine, and is found in other plants of different families. It constitutes thirty-four per cent. of the dried root. It has a sweetish taste, but is acrid to the mouth.

A foreign plant of this family, *Gypsophila Struthium*, possesses the same properties, and is used in Spain for scouring instead of soap.

LESSER STITCHWORT (*Stellaria graminea*).—This is a slender herb with quadrangular stems, and narrow, pointed leaves. It looks like a small form of the Great Stitchwort (*S. Holostea*) so common in our hedges, with white, star-like flowers. They both have five petals, but being

deeply notched, they appear to have ten in each flower.

This species has been proved to be very injurious, especially to horses on the Continent, and probably also to cattle. The motion of animals which had eaten it in fresh hay was awkward, their hinder parts weak. There was fever, sweating, redness of the eyelids, a stupefied condition, with inability to stand or walk. The treatment adopted consisted in changing the food, cold applications to the head, and the administration of saltpetre internally.

The poisonous effects appear to have been very great in the South Russian steppes. Of a drove of oxen fed on hay containing this Stitchwort, all were affected with colic, and seven died. Out of three hundred artillery horses during the Crimean War, which were fed on hay containing it, no less than seventy fell during the first twenty-four hours. Many other cases of poisoning are known.

It is supposed that the injurious effect is due to a narcotic property which, in about six months after drying in hay, appears to lose its effect.

Whether this common English plant is as poisonous as the Russian one, which is a variety of *S. graminea*, known as *hippoctona*, it is impossible to say; but as no complaints by English farmers have been made, it may be free from the poisonous principle, as is often the case with plants growing

in more northern regions, compared with the same species in South Europe.¹

WOOD-SORREL FAMILY (*Oxalidaceæ*),² WOOD-SORREL (*Oxalis Acetosella*, Fig. 16). This little plant occurs in our woods, etc. It has a creeping stem, knotted with thick-

ened bases of the leaf-stalks, which contain much starch as reserve-food. It has trifoliate leaves, and "sleeps", by dropping the three leaflets vertically, at night, slightly folding them, so that the underside of their midribs meet against the petiole. It has two kinds of flowers, perfect and "cleistogamous."³ The flowers have five free



Fig. 16. *Oxalis Acetosella*; Wood-sorrel.

sepal; five free, white petals and ten stamens; five having longer filaments than the other five (see figure). The pistil has five carpels, the ovaries being coherent, but the styles are free.

¹ The above facts are taken from a paper by Dr. T. Spencer Cobbold in the *Veterinarian*, 1880.

² Sometimes regarded as a tribe of the Geranium Family (*Geraniaceæ*).

³ Self-fertilizing in bud, by "concealed union," as the word means.

The Wood-sorrel was formerly called "Alleluya and Cuckowe's-meat, because," as Gerarde says, "When it springeth foorth the cuckowe singeth most; at which time also Alleluya was woont to be sung in our churches." Alleluia, however, is really only a corruption of the Calabrian name, Juliola.

The plant has a pleasant acid taste, and is consequently used in salads as the Common Sorrel.

Linnæus tells us that it was so plentiful in Lapland, that the inhabitants there use scarcely any other vegetable than this and Angelica.

The juice will remove ink-spots in consequence of the binoxalate of potash that it contains; sold under the names of "Salt of Sorrel" and "Essential Salt of Lemons," names which *sound* harmless enough; but the latter, at least, is very misleading, for it is really a dangerous poison. It has been taken in mistake for bitartrate of potash, or cream of tartar.¹

¹ Dr. Tanner prescribes the following treatment for poisoning by *Sorrel*, *Wood-Sorrel*, or *Oxalic Acid*. Chalk, whiting, or magnesia, suspended in water or in some demulcent fluid, must be administered immediately; and, if necessary, vomiting should be excited by tickling the fauces, or administering emetics of mustard or sulphate of zinc, etc., followed by large quantities of emollient drinks. The antidote, to be effective, must be given as soon as possible; the plaster of the apartment being used in the absence of the

remedies just mentioned. When there are symptoms of collapse, stimulants are to be freely employed.

As it is most important to be able to distinguish the above-mentioned two substances, I copy the following from Dr. Taylor's work :—Cream of tartar is known by its diluted solution not being precipitated by the sulphate in any salt of lime ; and by its being rendered only milky or turbid on the addition of nitrate of silver.

Lime-water furnishes a ready means of distinguishing these two salts. It precipitates both of them *white* ; but the precipitate from the bitartrate of potash is redissolved on adding to it a small quantity of a solution of *tartaric acid* ; while that from the binoxalate is *not redissolved*.

Ink-stains, if made from oak-galls, are removed by salts of lemon ; but not by bitartrate of potash.

For treatment of poisoning by *Oxalic Acid*, *Binoxalate of Potash*, or *Sodic Oxalate*, Mr. Blyth says : Unless the patient has already vomited freely, empty the stomach at once by emetics of zinc sulphate or mustard ; or the stomach-pump or tube may, in most cases, be used. If the *acid* has been taken, neutralize by chalk, lime-water, or, better, by saccharated lime-water ; but *on no account* neutralize by carbonate of soda or any alkali ; for the alkaline oxalates are extremely poisonous.

Give plenty of water to assist elimination by the kidneys : and apply hot fomentations to the loins.

An enema may be given, if necessary.

DIVISION II

PETALS, FREE; FLOWER WITH A RECEPTACULAR
EXPANSION

SPINDLE-TREE FAMILY (*Celastraceæ*).—We have only one representative of this family in Great Britain.

SPINDLE-TREE (*Euonymus europæus*, Fig. 17).—This is a smooth-leaved shrub, the leaves being very shortly stalked, opposite in pairs, with minute teeth on the margin. The flowers are in loose clusters, each flower being scarcely half-an-inch across. The four sepals are very minute, the four petals are green, arising from below a fleshy disk, which surrounds the flower, uniting the parts more or less together. The fruit is three or more lobed, becomes a beautiful rose-red colour, and when it bursts into several pieces, orange-coated seeds are visible. These are the parts which attract children, but are very injurious.

The common Spindle-tree received its name from its wood having been made into spindles. It

was also called Prick-wood from being used for skewers.



Fig. 17. *Euonymus europæus*; Spindle-tree (in flower).

It is the berries which are really harmful, for

they are emetic and purgative and have proved fatal to sheep.

The bark, leaves, and fruit are all injurious ; for children have been made to suffer by eating the violently purgative fruit.



Fig. 17*. *Euonymus europæus*; Spindle-tree (in fruit).

Although the tree has a sufficiently pronounced odour, goats and sheep which have browsed upon the leaves have suffered.

A species from South Europe and another from Japan are cultivated ; so that children should be

warned against eating¹ the very attractive-looking fruit and seeds.

BUCKTHORN FAMILY (*Rhamnaceæ*). — Two species of a single genus, *Rhamnus*, represent this family in Great Britain.

COMMON BUCKTHORN (*Rhamnus catharticus*, Fig. 18).—This is a shrub or small tree, with obovate,² minutely-toothed leaves. The flowers are very small, in axillary clusters, diœcious, *i. e.* male on one tree and female on another.

There is a receptacular tube with the sepals, petals, and stamens on the margin; the petals being *in front* of the sepals. The pistil, free within the tube, has the carpels coherent, from ovary to stigmas.

The whorls vary from fours to fives in the numbers of their parts.

The fruit is a small berry, ultimately black, about the size of a pea.

¹ For poisoning by *Euonymus*, Mr. Blyth recommends the same treatment as for *Foxglove* or *Digitalis*, p. 138.

² A leaf is ovate (*i. e.* egg-shaped) if the broad end is below; obovate, if it be reversed.



Fig. 18. *Rhamnus catharticus* ;
Common Buckthorn.

The berries, which are black, are purgative, as the above name implies. They have been used for colouring wine, but at the same time they render it harmful.

ALDER BUCKTHORN (*R. Frangula*).¹—It has been found that the berries of this second species appear to exceed those of the first in super-purgation; for a small boy who ate them suffered from headache, vertigo, unconsciousness, convulsions of the extremities, face, etc.; sufficiently alarming as a warning against eating the berries.

An important use of the berries of different species is for dyeing. Thus the juice of those of *R. catharticus* when unripe yields a saffron colour; but when ripe they supply the "sap-green" of painters. The berries of a foreign species, *R. infectorius*, called *Graines d'Avignon*, or "French berries," give a rich yellow colour. Those of our British species, *R. Frangula*, when unripe, dye wool both yellow and green, but when ripe both blue and green.

One foreign species known as "Cascara Sagrada" (*R. Purshianus*) is used in medicine; but all species of Buckthorn are purgative.

PEA FAMILY (*Leguminosæ*).—This is a very large family, but all our British plants are easily known by the peculiar form of the flower. They

¹ This species has entire leaves, *i. e.* without a toothed margin; and flowers with both stamens and pistil.

all belong to one tribe, called *Papilionaceæ*, from the imaginary likeness to a butterfly (*Papilio*, in Latin).

Though it is a family which supplies us with many useful foods, as peas, beans, haricots, lentils, etc.; as well as clovers, sainfoin, melilots, lucerne, etc., for horses and cattle; yet several plants are very poisonous, and should be carefully noted, and children warned, as usual, never to put flowers, fruits, or seeds into their mouths, especially those of the Laburnum, which belongs to this family.

BROOM (*Cytisus scoparius*).—This plant is too familiar to need much description. It may be taken as a type of our British plants of this order. It has a calyx of five sepals, but coherent forming two lobes, on which three minute teeth can be detected in front and two behind. There are five petals, the large one at the back being called the "standard," the two at the sides being the "wings," and two in front, coherent along the lower edges so as to form a boat-shaped structure, are called the "keel." There are ten stamens, all being coherent into a tube by their filaments. They surround the pistil composed of a single carpel, which forms the pod. The receptacle has spread out horizontally; and in most other leguminous plants secretes honey within the staminal tube. To enable the bees and other insects to reach it, the uppermost stamen is left free, allowing a passage

into the interior ; as may be easily seen in the pea and bean, etc.

Broom-tops are used in medicine, as they contain certain principles, one of which when obtained pure by the chemist is called *sparteine*, and is very poisonous and narcotic.

It is said that shepherds are well acquainted with the narcotic properties of the broom ; having observed that sheep become at first excited and then stupefied after eating it.

The seeds have similar properties to broom-tops.

LABURNUM (*C. Laburnum*).—This is certainly one of the most poisonous of all trees cultivated in gardens. Children have repeatedly picked out the unripe seeds and eaten them, or masticated the green pods. Again, a boys' school, once finding laburnum trees thrown away, chewed the roots on discovering that they possessed a flavour of liquorice ; but although fatal results do not seem to have followed on that occasion, the sufferers were made seriously ill with all the symptoms of narcotic poisoning.

Indeed, all parts of the tree are harmful : roots, bark, wood, leaves, flower-buds, petals, pods, and seeds. No part can be put in the mouth without risk.

Drying has no influence upon the poisonous property, as it is not volatile. Even boiling the

seeds for two hours did not altogether remove the toxic principle; so that they cannot be used in any way as food for animals.

Children carrying bunches of the flowers of laburnum should be warned against putting them in their mouths; and cooks against using them in culinary operations, instead of the false acacia; and even that tree has deleterious properties. A case is recorded of some pieces of bark being put into soup, which induced a protracted illness, lasting twelve months, in a person who partook of the soup. Several children, having eaten the green pods and seeds, were dangerously ill; as also was a child, between three and four years of age, who ate twelve flowers. But after an emetic, it recovered.¹

Though the seeds are violently purgative, emetic, and decidedly poisonous, it is said rabbits and hares are particularly fond of the tree, which they are apt to injure seriously by gnawing the bark. In some places the seeds are sown in plantations,

¹ Dr. Tanner recommends for poisoning by *Laburnum*, emetics, castor-oil, and stimulants. Cold affusion will often be useful, more especially if there be much stupor.

For poisoning by *Laburnum* seeds, etc., Mr. Blyth recommends emptying the stomach by the pump. Wash it out with tea or coffee; or give as an emetic, mustard or sulphate of zinc. Follow up this treatment by an enema or brisk purgative. Stimulants may be given; the patient may be roused by hot or cold douche. Similarly for Broom.

because these animals will not injure other trees if they can get a supply of laburnum ; and though they may eat them to the ground, they will spring up again next season, and so yield a regular supply of winter food.

On the other hand, some rabbits which ate some bark died in three minutes in tetanic convulsions, according to Dr. Taylor's account. One can only account for these results by different effects of climate ; the hotter the country, vegetable poisons are the more strongly developed.

SCARLET RUNNER (*Phaseolus vulgaris*, var. *multiflorus*).—Though this plant supplies us with an excellent and highly nourishing food material, yet experience has proved that sheep are the only animals which ever eat it as green food, or the seeds of Haricots when soaked. It appears to contain some deleterious property, which especially resides in the roots, which have, indeed, been described as poisonous.

Wistaria sinensis is a familiar climber, with racemes of mauve-coloured flowers, appearing before the leaves. Children have suffered with severe sickness, vertigo, and nervous disorders from masticating the flowers of this plant. The symptoms are analogous, if not more or less identical, with those which ensue from eating laburnum seeds.

SCORPION SENNA-TREE (*Coronilla Emerus*), *C. varia*, etc., from Europe.—It has pinnate leaves of

about seven to nine pairs of leaflets. The flowers are in umbels. The leaves are purgative, containing the same principle as the *Cytisus*.

SPANISH BROOM (*Spartium junceum*) has long been cultivated as a garden plant. The stems are usually leafless, bearing large, yellow, fragrant flowers. Though used as a forage-plant in Languedoc, it has been found that animals, after browsing upon the young shoots in spring, have suffered somewhat. A similar affection has followed their eating the buds of the oak.

LUPIN (*Lupinus*, sp.).—Lupins are easily known by their digitate leaves and long spikes of blue, lilac, yellow or white flowers.

Of this genus, one species (*L. albus*) was cultivated by the ancients for its seeds as food, both by Greeks and Egyptians; and they are still used in Andalusia, Corsica, and Piedmont.

A lupin with blue flowers is cultivated in France for the nourishment of sheep; but another, a dwarf species, native of the Mediterranean regions, is a yellowed-flowered one (*L. luteus*). It has also fragrant flowers. It is often eaten by animals, being less bitter than the white-flowered lupin. However, in Germany it has been so troublesome in causing a complaint, that this has been called "lupinose." It began in 1860, on sheep; in 1880, of 240,000, 14,138 died of it. Though sheep were

principally affected, the goat, ox, horse, dog, and rabbit did not escape, nor did a man, after consuming the seeds of the yellow lupin.

When animals are fed nearly exclusively on this lupin and straw, the malady is particularly intense ; whereas it is beneficial if it be combined with hay or beetroot in certain proportions.

The lupin appears to become inoffensive when mixed with other herbage in "silo," as acetic fermentation takes place, and the injurious principle is dissipated.

But, on the other hand, some toxic principles are developed and accumulated in the topmost layers. Hence caution is necessary, in using this food, to remove these layers.

Children, who are so fond of picking out and eating unripe leguminous seeds, should be warned against doing so, not only with the laburnum and yellow lupin, but in the case of *all* other kinds as well.

YELLOW VETCHLING (*Lathyrus Aphaca*, Fig. 19).—A cornfield weed, from the midland counties southwards, not common here, but frequent in South Europe, is our only British leguminous plant, unless we except the Broom, which is recognized as poisonous. It is remarkable for having no leaves, a pair of spear-shaped stipules doing duty for them, while a long slender tendril replaces the

leaf. It bears a single small yellow flower at each node. People have suffered from violent headaches and vomiting after having eaten the seeds.

Three foreign species of Vetchling, *L. sativus*, *L. Cicera*, and *L. Clymenum*, have caused an epidemic malady in Spain, Italy, and Africa, where the seeds have been eaten; but in this country it has been with horses only that mischievous effects have resulted from the introduction of so-called "Indian peas," which proved fatal to several. This was experienced by the Bristol Tramways Company in 1894.

LOCUST TREE, or FALSE ACACIA (*Robinia Pseud-acacia*).—This tree is a very familiar one in gardens, having pinnate leaves and racemes of white flowers resembling in form those of the laburnum. It contains a poisonous principle in the leaves and bark. A Chinese woman is reported to have been very ill after eating the leaves; but she recovered.

The ROSE FAMILY (*Rosaceæ*).—Though we



Fig. 19. *Lathyrus Aphaca*; Yellow Vetchling.

have valuable fruits from this family, such as plums, raspberry, strawberry, pears and apples, the first-mentioned belong to a genus of which some species produce prussic acid. Not that this poison exists in the plant, such as the bitter almond ; but this fruit contains two principles called "Amygdaline" and "Emulsine," harmless in themselves when separate, but in the presence of water they produce prussic acid. The Amygdaline appears to be confined to the cellular tissues of the embryo, the Emulsine being in the traces of the fibrovascular cords.

It is chiefly the tribe *Pruneeæ*, which contains the genus *Amygdalus*, the almond, and *Prunus*, including all kinds of plums and cherries, that has these substances which can give rise to prussic acid. It is the cherry-laurel, the common garden shrub, and the bitter almond with which we are now only concerned.

ALMOND (*Amygdalus communis*) has produced several varieties under cultivation. It is only the variety, the so-called bitter almonds, in the use of which some caution is necessary, especially with regard to children ; and the distilled water of bitter almonds, or the essence, when used for flavouring bon-bons, etc.

Animals have been poisoned by having been fed with oil-cake made from the refuse in the manufacture of the oil of almonds, which itself

is harmless, at least when quite pure and not contaminated.

Two principles thus give the bitter almonds their poisonous properties, the "essence" and "prussic acid." This is why bitter almonds and ratafia biscuits should be only eaten sparingly.

Essential oil of Almonds, or Peach-nut oil, which is produced by the distillation of the pulp of bitter almonds with water, is a powerful poison, and has caused numerous deaths, in consequence of the presence of prussic acid, which is intimately combined with it. Five pounds of almonds are calculated to yield about half-an-ounce of the oil, containing on the average ten per cent. of prussic acid.

The liquid called "Almond Flavour," spirit of almonds, or essence of peach-kernels, is sold to give a pleasant flavour to confectionery. It may be as well to state, writes Dr. Taylor, from whose work the preceding is copied, that one ounce of this almond flavour is, at the lowest computation, equivalent in strength to two hundred and fifty grains of the pharmacopœial prussic acid, yet it is entrusted in private families in the hands of ignorant cooks to apportion the dose which may give the requisite flavour to food!

Mr. Blyth, in a lecture on Old and Modern Poison Lore, says:—"On an Egyptian papyrus are the words, 'Pronounce not the name of I. A. O. under

the penalty of the peach.' As the Egyptians were the first known to have practised distillation, this referred to the formation of prussic acid. The knowledge passed to the Romans, for a knight in the reign of Tiberius, accused of high treason, swallowed poison and fell down dead. No poison but prussic acid, and that in a tolerably concentrated form, would have this effect."

Dr. Tanner asserts that cases of alarming illness have occurred from eating bitter almonds too freely; and that the essential oil obtained by distilling the pulp of these almonds into water is a powerful poison.¹ The essence or *oil of bitter almonds* contains about ten per cent. of prussic acid; and it is probable that from ten to thirty drops would prove

¹ Dr. Tanner suggests the following remedies:—Stimulating frictions to the chest and abdomen, warmth to the surface, and the application of ammonia to the nostrils.

Dr. Brunton gives the following antidotes to poisoning by *Prussic Acid*:—Alternate cold and warm effusions over the head and neck, to cause a shock (Tanner). Artificial respiration. Injection of atropine (two to four min. liquor atropiæ) repeated every half-hour.

For poisoning by *Prussic Acid*, or *Bitter Almonds*, etc., Mr. Blyth says:—Use the stomach-pump or tube; or if not at hand, an emetic of mustard or sulphate of zinc.

If the breathing has stopped, try artificial respiration and weak shock to the heart.

A brandy enema may be given. The body must be kept warm, but the cold douche may be advantageously applied to the head.

fatal to an adult. Dr. Taylor records many fatal cases from this poisonous oil.

CHERRY-LAUREL (*Prunus Lauro-cerasus*).—It is the leaves of this common shrub which are dangerous, and more so in the autumn than in the spring. It is in the south of Europe where the poison is mostly if not only developed. The custom there of flavouring milk with laurel-leaves has caused injury to infants. More frequently has the distilled *laurel-water* caused misfortunes when used unadvisedly by ignorant practitioners.

Dr. Taylor says that laurel-water is a weak solution of prussic acid, containing only about one-fourth of a grain per cent. of the strong acid, but it is said to be more poisonous than this quantity of acid would indicate. The leaves gathered in wet and cold weather are said to yield more prussic acid than those gathered in hot and dry weather.

It is a limpid, colourless liquid, producing in large quantities the usual effects of poisoning by prussic acid.

Dr. Taylor says that the late Dr. Paris stated that several children were severely affected by partaking of some custard flavoured with laurel-leaves, and were ill for three days. Half a teaspoonful of a mixture consisting of four-fifths cherry-laurel water, was given by mistake to an infant eight months old. It died in a few seconds.

Noyau and other liqueurs, as cherry-ratafia,

having the odour of bitter almonds, are to be considered as poisonous when taken in considerable quantity.

Many animals have been poisoned on the Continent by eating the leaves of the cherry-laurel, both sheep and oxen. It is recorded that a bull which had gained a prize (at Rovoretto in Italy) was decorated with a garland of laurel; the bull ate the garland and fell down poisoned on the spot.

In England it appears to be much less, if at all, harmful. The present writer's cows completely ruined a long laurel hedge adjoining the field in which they lived; but this abnormal food did no harm either to themselves or the milk they produced. This was at Ealing, near London.

The kernels of several members of the genus *Prunus*, as Bird-cherry, Peach, Nectarine, Damson, and Apricot, contain this poison. Thus a child, aged two, suffered severely in consequence of having eaten ten or twelve kernels of the apricot; and a child, aged five, died from eating a large quantity of the kernels of Gean cherries (*Prunus Avium*).

All the following plants yield, with appropriate treatment, more or less prussic acid:—*Amygdalus communis*, *Prunus Lauro-cerasus*, kernels of plum (*P. domestica*); bark, leaves, flowers and fruit of the wild service-tree (*P. Padus*); kernels of the

common cherry and apple ; leaves of *P. capriceda* ; bark of *P. virginiana* ; flowers and kernels of the sloe (*P. spinosa*) ; leaves of *P. (Cerasus) aceda* ; bark and almost all parts of *Sorbus (Pyrus) Aucuparia, hybrida, and torminalis* ; young twigs of the hawthorn (*Cratægus Oxyacantha*).

Leaves and partly also the flowers of the shrubby species of *Spiræa*, as of *S. Aruncus, S. sorbifolia,* and *S. japonica* ; but the bark and green parts of herbaceous species of *Spiræa* yield no prussic acid.

MELON FAMILY (*Cucurbitaceæ*).—The following is the only British representative of this large and important family :—

BRYONY (*Bryonia dioica*, Fig. 20).¹—It is dicecious, the male and female flowers being on different plants. The roots are often of an immense size, sometimes nearly two feet long, thick as a man's arm, white, succulent, and fleshy, with an acrid, bitter, and disagreeable taste. It is occasionally



Fig. 20. *Bryonia dioica* ; Bryony.

¹ It is also known as White Bryony, Tetter-berries, Wild Hops, Wild Vine, and Wild Nep ; the last being the mediæval name.

offered for sale as the "mandrake," with which it has nothing to do; as the latter belongs to the Potato Family. The Bryony root is cathartic, sometimes emetic, and causes internal inflammation, being highly irritant. Bruised and applied to the skin, it is capable of producing blisters.

The foliage is the same in both, being of lobed and pointed rather rough leaves.

The plant supports itself by long thread-like tendrils, which as soon as they have caught hold of anything make a number of close coils, some one way; some, about the same number, the other way; this is to avoid breaking under the strain.

The flowers are yellowish-green, the male being the larger. It consists of a coherent calyx, a coherent corolla, and five stamens united in two separate pairs and one single one. The anthers are "sinuate," that is taking the form of the letter **S**.

The female flower (on the right in the figure) is at once recognized by its globular inferior ovary. The corolla is rather smaller than that of the male plant, and has the three stigmas in the middle; each of them is bi-lobed.

The fruit is a scarlet berry. Entire families have been poisoned from eating the root instead of parsnip, and children from eating the berries. Fifteen berries have been known to produce death in a little child; but forty were consumed by one adult, when death ensued.

The large root contains a great quantity of starch, which one could easily separate with cold water, when the poisonous juice would be eliminated; just as in preparing tapioca from the very poisonous plant from which it is obtained.

It may be added that the fruit of all members of this family contain in the wild state an active principle which must be regarded as being more or less poisonous; especially in the pulp. This is the chief cause of disorders frequently produced by cucumber, melon, etc., in certain habits and constitutions. Under cultivation the principle is so attenuated in the mass of watery cellular tissue that they, of course, become perfectly harmless and delicious fruits.¹

CARROT FAMILY (*Umbelliferae*).—This is a very large family, showing great uniformity in the structure of the flowers and fruits, as well as in the foliage and roots; so that many mistakes have been made by eating poisonous members of the family for harmless ones, for although such plants as the parsnip and carrot, as well as parsley and fennel, are valuable kitchen herbs, others like the Hemlock and Cowbane are notoriously of a dangerous character. Hence it is most important that their distinguishing features should be care-

¹ Dr. Tanner recommends emetics to remove the poison of *Bryony*, unless spontaneous vomiting has freely taken place. If it has passed into the intestines castor-oil must be given.

fully noted. These are mainly to be found in the *foliage* and *fruits*. To understand the latter, a careful study of the figures here given, as well as of the living plants themselves, should be made.

FOOL'S PARSLEY (*Æthusa Cynapium*, Fig. 21).—

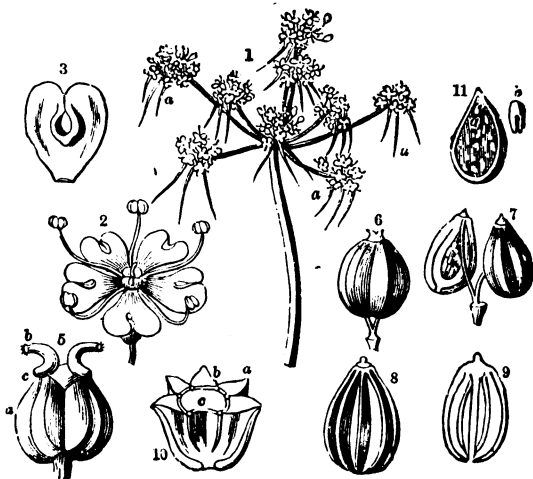


Fig. 21. *Æthusa Cynapium*; Fool's Parsley.

A small annual weed in gardens and cornfields. It has white flowers, with *long pendulous bracts below them*.¹ The fruit has prominent, sharp-edged, corky ridges.

¹ When there are bracts at the base of the primary umbel they constitute the "general involucre." Those at the base of the secondary umbels as in this plant form the "partial" involucre or involucl.

The accompanying illustration will not only illustrate the Fool's Parsley, but explain the structure of the flowers of all other members of the Umbellifers, as there is great uniformity, allowing for variations of detail.

All the Umbellifers are herbs, often with a thick tap-root like the carrot and parsnip, which belong to the family. The leaves rise from the ground and also from the stem. They generally have divided blades or compound leaves, and in some species they are finely dissected, as of fennel. The stalks more or less sheath the stem at the base.

The flowers are clustered together on little pedicels radiating from a terminal point of longer stalks, which again radiate from the main stem. This arrangement is called a compound umbel. The structure of a flower is as follows, as given in Fig. 21. The complete flower has an inferior ovary (Fig. 5 *a*). The five sepals, which should lie under the five petals, are wanting. The petal tips are inflected (Figs. 2, 3). Five stamens alternate with them. In the centre is seen a two-lobed honey-disk with the two short styles arising between them in the middle. Hence the petals and stamens appear to rise from the summit of the ovary; but the reader will remember that this is explained by the ovary being invested by an adherent receptacular tube, which has carried the petals and

stamens up to the top. The honey-disk is developed out of the top of the ovary.

When the petals and stamens have fallen off, the inferior ovary ripens into a fruit (Fig. 5).¹ This now develops ridges (Figs. 6-10 *a*). It then splits in half, that is to say the two carpels separate and remain suspended on a **V** or **Y** shaped support (Fig. 7). They finally break away and fall to the ground. Each half (Figs. 7-9) contains one seed (Fig. 11) full of endosperm, in which lies buried a minute embryo (Fig. 11 *a, b*).

This plant is considered to be less active than the hemlock, nevertheless it has occasioned more accidents; since, so often growing in gardens, its leaves have been taken for parsley and eaten by mistake.

Animals refuse it, and birds which have eaten it have died.

It can be distinguished from parsley not merely by the want of the familiar odour of that plant, but by the dark colour of the stem, especially the lower part, and by its disagreeable smell when bruised. Moreover, the colour of the flowers of parsley are yellow, while those of the fool's

¹ The curved styles are not drawn accurately, they should both arise from the middle (just below the num. 5), and the disks should be represented as two nearly flat semi-circular cushions, extending outwards right and left, to the margins of the ovary.

parsley are white. Note also the pendulous bracts.

The symptoms it produces on man are heat in the mouth and throat, nausea and vomiting; with headache, giddiness, stupor, convulsions, and lockjaw. Convulsions and stupor occur in all animals poisoned by it.

No fatal case appears to be caused from the fool's parsley before 1845, when a little child ate the roots, which resembled radishes. Sickness and a tendency to lockjaw followed, death terminating the seizure in an hour. The leaves have been eaten in soup in the place of parsley with similar results, death in that case taking place in twenty-four hours.

In the numerous cases of poisoning with this plant, by far the majority were not fatal; but in one case the root was boiled in soup under the impression it was parsley. One child who partook of it died.

Other cases have proved that the root contains a very energetic poison.¹

¹ Dr. Tanner recommends emetics, castor-oil and stimulants to be resorted to in poisoning by *Fool's Parsley*. Cold affusions will often be found useful, more especially if there be much stupor. Another writer suggests after the poison has been ejected, citric or some other vegetable acid should be administered; besides the cold affusions mentioned, mustard poultices may be applied to the feet; together with small doses of sulphate of magnesia during the cure.

It may be added that Dr. J. Harley maintains, that having experimented on himself, on others, and on animals with the expressed juice and with the tincture, he found the effects to be entirely negative. Some of the published cases he refers to Hemlock, others to Aconite.



Fig. 22. *Conium maculatum* ;
Hemlock.

Since, however, plants vary greatly according to climate and soil, it is possible that he had samples that were more or less or quite harmless ; just as bread has been made to test the poisonous properties of Darnel with perfectly innocuous results. Again, he does not appear to have used the living plant itself. It is safer, therefore, to believe what has been otherwise universally attributed to this plant.

HEMLOCK (*Conium maculatum*, Fig. 22).—This is a tall biennial, growing from three to six feet, or more. It has a forked, pale yellow root. The stem is erect, hollow, striated, perfectly smooth, bright green, but mottled with stains or spots of a port-wine colour, and covered with a “bloom” which is

easily rubbed off. The leaves are large and compound ; the segments being deeply cut. Each "tooth" is tipped with a minute sharp white point. The fruit has many ridges, as shown in the figure. It is not uncommon in hedges and waste places ; and is easily recognized by the above characters, especially the *smooth spotted stem*, as well as the size of the plant and foliage.

The Hemlock was well known to the ancients as poisonous ; and it was the juice of this plant, in all probability, which Socrates was compelled to drink.

Like so many other poisonous plants—as the Aconite, Cherry-laurel, etc., it is much more injurious in the hotter countries of South Europe than in the North. Before flowering, the poisonous principle is principally in the foliage, but it becomes less so when the plant is in fruit, as this latter then acquires it, which is more active before being ripe than afterwards.

When cut and dried, as in hay, the Hemlock loses much of its poisonous properties, which are volatile and easily dissipated. Cooking destroys it ; so Pliny observes that it was actually eaten in his day when thus prepared as food.

Poisoning of human beings has apparently mostly, if not always, resulted from errors in administering the extract of Hemlock ; for its disagreeable odour has prevented its use as a vegetable in the raw state. This has been the cause of mishaps

with other members of the family of Umbellifers. Animals, too, have rarely been poisoned, as they all refuse it. This has only occurred when mixed with other herbage, and especially at spring-time, when they eat with avidity anything green.

Some animals appear able to eat the Hemlock with impunity; thus larks and quails are said to do so in Germany; but their flesh becomes so impregnated with the poison, that carnivores which have eaten them have died. On the other hand, ducks have been poisoned by eating the fruits, though thrushes have been observed to eat them with impunity.

The Hemlock of South Europe is much more energetic than that of more northern regions. Narcotic effects are said to be felt by those who breathe for a long time air impregnated with the effluvium.

That the poisonous property is not destroyed by boiling is proved by a case of two soldiers who collected herbs for boiling with bacon. They partook of the broth, and then of the herbs and bacon. They died in about three hours.¹

¹ Dr. Brunton gives as antidotes to poisoning by *Hemlock*—Tannic acid, stimulants, and coffee.

Dr. Tanner adds:—Emetics, castor-oil; cold affusion will often be useful, more especially if there be much stupor.

For poisoning by *Hemlock*, Mr. Blyth recommends emetics of sulphate of zinc or mustard. Keep up the temperature of the body by hot wraps. Administer strong tea, or any harmless vegetable decoction containing tannin. Stimulants may be given. If necessary, use artificial respiration.

CELERY (*Apium graveolens*).—The wild plant is also called Smallage. It is acrid, and should not be eaten ; but it loses all deleterious properties, or rather does not develop them, when it is blanched under cultivation. In Malta it is always used green for flavouring soups, etc. The wild plant has a very strong smell of celery, and can often be detected by the odour, even at some distance off. It is more common near the sea, though it occurs by ditches inland.

It is a plant with no very marked feature by which it can be distinguished, except the familiar smell of celery when bruised, and its umbels have neither a general involucre nor involucl.



Fig. 23. *Cicuta virosa*; Water-Hemlock, or Cowbane.

WATER-HEMLOCK, or COWBANE (*Cicuta virosa*).—This is a tall-growing plant, with *long, narrow serrated segments* to the compound leaves. The flowers are white. There is no general involucre ; but an involucl of many bracts is present. The fruit has five scarcely prominent ridges. It frequents watery places, as marshes and ditches. It

has a white, fleshy root, containing a yellow juice. The stem is hollow.

It is regarded as being the most poisonous of the Umbellifers. The thick root has been the occasion of fatal results when eaten instead of parsnip or celery.

Animals only very exceptionally have been poisoned by it; though it has been stated that both sheep and goats can eat it without being seriously inconvenienced.

As an instance, two men died near Sunderland by eating the roots when they were at work. Both were found unconscious and paralyzed. Several cases of children having eaten the root and died are on record. In one case castor-oil in the form of an enema saved the life of the child.¹

WATER-DROPWORT (*Ænanthe crocata*, Fig. 24).—This is a tall plant, from three to five feet in height. It has a channelled, hollow stem, compound leaves, with much-divided leaflets. The segments are rather broad, wedge-shaped, and lobed. The fruit is narrow, oblong (see figure). The ridges are not very prominent.

The plant bears from five or more spindle-shaped fleshy roots of a pale yellow colour, mixed with fibrous ones. They contain a milky and very

¹ Dr. Tanner prescribes for poisoning by *Water-Hemlock*, emetics, castor-oil, and stimulants. Cold affusion will often be useful, more especially if there be much stupor.

poisonous juice, which becomes yellowish on drying.

Every year men and animals are poisoned on the Continent, and not infrequently here also, by their inadvertently eating the roots of this plant. The leaves have been eaten instead of celery, and the roots instead of parsnips.

Cattle have been poisoned by eating the plants thrown upon the land when the ditches have been cleared out. It is said they eat them without repugnance, domestication having weakened their instinct.

All parts of the plant are poisonous, but the roots are much more so than the stem and leaves. Drying only destroys the poison in some degree,

and cooking weakens it still more, but does not eliminate it altogether. Of animals, though all kinds are poisoned by it, carnivores are less susceptible to the action than the herbivorous.

A writer records how a number of convicts working near Woolwich came across a quantity of the



Fig. 24. *Cenanthe crocata*; Hemlock Water-Dropwort.

Water-Dropwort, and thinking it closely resembled parsnips, seventeen of them ate it. Shortly after, nine went into convulsions; six of them died within a few hours. In one case the quantity taken did not exceed the top of the finger in size. The symptoms were insensibility, tetanus, delirium, and



Fig. 25. *Ceanothe Phellandrium*.

insanity. The behaviour of persons poisoned is described as being like those of *delirium tremens*. The *root* is considered to be the most active part of the plant; it is described as being not unpleasant to the taste; but a very small portion of it, unless speedily ejected by an emetic, will suffice to destroy life.

C. Phellandrium (Fig. 25) is also an aquatic plant, growing in ponds and ditches. The leaves have finely-divided segments, and those submerged, as is so generally the case, almost thread- or fennel-like.

Though poisonous, its deleterious principle is less at spring-time than later in the season; so that cattle can browse upon it with impunity; but it is injurious to horses.

Æ. fistulosa (Fig. 26) is also aquatic. It has a mixture of slender and fleshy roots. The leaves are much arrested with few, narrow segments and hollow petioles (see the figure).

The sepals of the flower are unusually large (see figure); as in most umbellifers they are quite rudimentary.

This species is poisonous; but it is only exceptionally that animals have eaten it spontaneously.¹

Though the above species are very dangerous, yet one, *Æ. pimpinelloides*, a rare plant in England but commoner abroad, has roots which are eaten. They are full of starchy matter with the flavour of filberts, and were formerly sold at Angers and other continental markets. It is said, however, that when wild they are not so harmless as when cultivated.



Fig. 26. *Ænanthe fistulosa*; Common Water-Dropwort.

¹ Dr. Tanner recommends for poisoning by species of *Ænanthe* or *Water-Dropwort*, emetics, castor-oil, and stimulants. Cold affusions will often be useful, more especially if there be much stupor.

WATER-PARSNIP (*Sium latifolium*, Fig. 27).— This umbellifer occurs in watery places all over the British Isles. The root of this, as well as of the only other species we possess (*S. angustifolium*), is reputed deleterious; but pigs and oxen eat the stem without apparent inconvenience. Still



Fig. 27. *Sium latifolium*; Broad Water-Parsnip.

it is important nevertheless not to allow cows in milk to eat it, as it communicates a disagreeable taste to the milk.

Both species are easily recognized by their pinnate leaves; the leaf-stalks carrying about six to eight pairs of ovate toothed leaflets. The general involucre is composed of broadish or lanceolate bracts; and there is also an involucl.

There are slender ribs on the fruit, with rather prominent pointed calyx-teeth.

BEAKED PARSLEY (*Anthriscus sylvestris*) is only too common in hay-fields, multiplying with great rapidity and bearing a profusion of white flowers. It is sometimes called cow or sheep's parsley; the fruits are elongated, perfectly smooth, and without any ridges whatever.

The plant has rather a strong odour and a bitter taste. Though cows refuse it, most animals can eat it with impunity. But a case is on record of a herd of pigs foraging among a quantity of the beaked parsley, which was struck with a sort of paralysis. Four died from severe internal inflammation.

WILD CARROT (*Daucus Carota*).—One would not suspect this plant of having any deleterious properties. It certainly has none when cultivated; but a remarkable occurrence is reported in the case of some white mice to which the roots of the wild carrot were given to eat; they died very quickly after consuming it.

Nothing is known of any deleterious principle in the wild form of the plant. It has a rather strong odour and taste. Further researches are required.

COW-PARSNIP or HOGWEED (*Heracleum Sphondylium*), a coarse-growing plant with large leaves and broad, rough leaflets, common in moist woods and meadows. It is usually regarded as entirely inoffensive; and it is only under special conditions that it appears capable of doing any harm. In Belgium it has given rise to the affection known as *Panaisie*; because in that country it is commonly called Cow-Parsnip. A number of workmen in the month of August in 1856, at a time of great heat and heavy dews, the plants being

charged with dew, were employed to root up plants of the hogweed in a certain park. Nearly all of them experienced the same, or the next day, a sensation of intense heat in the left arm and about the wrist. An inflammation like erysipelas developed itself accompanied by sores, which prevented them from working for nearly three weeks. Some beasts which ate the uprooted plants suffered internal irritation. The left arm being injured is explained by the workmen having torn up the plants with their right hand, and then laid them across the left arm. It was observed that the workmen who began their work early, suffered much more seriously than the later arrivals, when the sun had dissipated the dew.

Looking for the cause of *Panaisie*, it has been suggested that it is the essential oil ; that during the day this oil evaporates as it is formed ; but in a misty morning, without sun, in a meadow charged with dew, it is condensed instead of being volatilized ; then being dissolved in the dew which covers the plant, this acquires the irritating property which gives rise to the complaint.

The IVY FAMILY (*Araliaceæ*).

IVY (*Hedera Helix*).—This is our only representative, and is too well known to need description. The dark-coloured berries are attractive to children, as they appear in the winter ; and several

cases have been known of their suffering from eating them. They prove to be very emetic and purgative, etc., producing more or less inflammation in the digestive canal. The berries contain a very bitter principle, apparently somewhat akin to quinine. They are, however, largely eaten by wood-pigeons, blackbirds, and thrushes.

DIVISION III

COROLLA, WITH THE PETALS COHERENT

ELDER FAMILY (*Caprifoliaceæ*).

COMMON ELDER (*Sambucus nigra*).—This is a tree or shrub familiar to all. It has compound pinnate leaves like those of the ash-tree, and flat-topped “corymbs” of numerous yellowish-white flowers.

A close examination will reveal an inferior ovary, five points on the top of it represent the calyx, the corolla has the petals coherent and the five stamens, as usual with coherent corollas, adherent to it. Three minute stigmas reveal the fact that there are three carpels. The style is swollen into a conical fleshy mass as the organ for secreting honey.

There are several uses to which the elder is put, but in only one or two particulars can it be regarded as deleterious. Thus, while Elder flowers, which yield a volatile oil by distillation, are used in poultices, etc., and the berries make an excellent

wine, yet an infusion made from the leaves is fatal to insects, so that some gardeners use a strong infusion to preserve delicate plants from insects and caterpillars. The young leaf-buds are very purgative, and are somewhat dangerous in consequence. The bark, too, is violently cathartic. The juice of the root, taken as a supposed remedy for a bilious attack, proved fatal in the case of a woman; and the leaves have caused severe irritant poisoning in a child.

DWARF ELDER, or DANE-WORT (*Sambucus Ebulus*) is a somewhat local species, and sub-herbaceous rather than being a woody plant. It produces black shiny berries.

It has a strong odour which repels animals. Although the root, bark, and leaves possess violently purgative properties, no accident has been recorded from misuse of these parts.

The berries, equally purgative, rarely tempt children because of the odour of the plant. They have, however, been fraudulently used for colouring wine, to which they impart their deleterious properties.



Fig. 28. *Sambucus Ebulus*; Dwarf Elder.

Turkeys have been known to suffer from eating the berries. Drying weakens the activity of the deleterious principle, but does not completely destroy it.¹

DAISY FAMILY (*Compositæ*).—This family is often called Composites, because instead of having separate flowers, the so-called “flower” is really composed of innumerable “florets,” often of two kinds. Those in the middle of the “head”—say a daisy—have yellow corollas with a five-toothed border. These are called “disk-florets,” while those on the circumference have a narrow strap-shaped or “ligulate” corolla. These form “ray” florets.

In some plants the ray is wanting, as in the minute heads of Wormseed, and Wormwood of the genus *Artemisia*.

In one section *all* the florets are alike and “ligulate.” This is the case with the dandelion and lettuce.

The enormous family of Composites possesses very few poisonous kinds. We have only two to be mentioned of English plants.

WORMSEED (*Artemisia maritima*).—The commonest species of this genus is Mugwort (*A. vulgaris*), while the old-fashioned garden plant (*A. Abrotanum*) is known as Southernwood. *A. Dracun-*

¹ For poisoning by *Elders*, Dr. Tanner recommends the same treatment as for *Bryony*. Note, p. 85.

culus is the herb Taragon. And Wormwood (*A. Absinthium*) flavours absinthe. The species are often bitter; some Eastern kinds were the Wormwood of Scripture.

The species first mentioned is a native of maritime saline districts, and possesses a principle called *Santonin*, which is included in our British Pharmacopœia.

The minute flower-heads, for it is a member of the Composite family, are a popular remedy for certain infantile complaints, and have often been administered unadvisedly with fatal results, but in small proportions, viz. two in eighteen, or eleven per cent.

It has the remarkable effect of affecting the sight, making everything to appear yellow; and this effect may last twenty-four hours. This yellowness is preceded by a violet hue in some cases.

WILD LETTUCE (*Lactuca virosa*).—This has a milky juice like that of the dandelion. It is an annual, frequenting waste stony places, and is



Fig. 29. *Lactuca virosa*, var. *Scariola*; Wild Lettuce.

from one to two feet high. Another species, according to some botanists, *L. Scariola*, has erect leaves, with deeply-cut lobes; but Mr. Bentham unites the two. It is the origin of the garden lettuce.

In the wild state it exhales a disagreeable odour, so that animals will not touch it. But it has no very active properties.

It was thought that the milky juice was the same as in poppies, but analyses can trace neither morphine nor narcotine, which is characteristic of the opium poppy. The principle is peculiar to this plant, and is called Lactucine.

It is to this that the lettuce owes its narcotic properties; but no case is known of any poisoning by *Lactucarium* or "Lettuce opium" as the inspissated milky juice is called. It has a weak narcotic action when given in doses of from five to twenty grains. Two grains will cause headache and somnolency in some persons; so that it has been recommended as a substitute for opium, as it is not followed by the injurious effects of that drug.

It has had the credit of being a poisonous plant; but it would seem that its deleterious properties have been somewhat exaggerated.¹

LOBELIA FAMILY (*Lobeliaceæ*).—Lobelias are

¹ Dr. Tanner knew of no case of poisoning in 1862. Should such occur, emetics and full doses of castor-oil might be given.

by some botanists included in the Campanula or Canterbury-bell family. They differ by having irregular flowers.

The ovary is two-celled and inferior. The calyx consists of five pointed sepals on the summit of the inferior ovary; the corolla, instead of having its petals coherent into the bell-shaped structure of Canterbury-bells, has it split down the posterior side, to allow the stamens to pass through it. These have their anthers united into a tube, and not free as in Campanula. The style is provided with a tuft of hairs just below the two flap-like stigmas, which are at first pressed together. The use of this contrivance is to sweep out the pollen as the style passes up the anther-tube. Having done this the stigmas separate. It is then ready for the visits of insects.

Like the Campanulas, Lobelias have a milky juice. In both it is remarkably bitter and acrid, but while the former are not regarded as poisonous—indeed one species of Campanula called Rampion was cultivated for its thick tuberous roots, which are milky and eaten in salads—the Lobelias are dangerously poisonous. We have only two species of *Lobelia* to represent the family in England.

LOBELIA (*L. Dortmanna* and *urens*).—Of these two British species, the former occurs in lakes in Wales, and the latter is found near Axminster. But numerous species from America are in cultiva-

tion; the most familiar is perhaps the little blue-flowered plant used for bedding in summer, *L. Erinus*, from the Cape of Good Hope.

Lobelias have a very acrid milky juice. If taken internally, it provokes symptoms analogous to those produced by Belladonna, as it contains *Atropine*. Hence the specific name *urens*, "burning." Its action is said to be very much like that of tobacco, only differing in the greater intensity of the local burning sensations. Disastrous results have followed the misuse of the drug obtained from an American species, by incompetent persons.

The species used in medicine is known as "Indian Tobacco" (*L. inflata*). It is a native of North America; and its powdered leaves and seeds have been employed as a remedy for asthma. In one instance—writes Dr. Tanner—a quack prescribed a drachm of the leaves which produced pain, vomiting, and unconsciousness, death following in thirty-six hours. Ignorant impostors, calling themselves medical botanists, have poisoned several simple individuals, both in England and America, by physicking them with this mischievous and powerful drug. The seeds are equally poisonous.¹

¹ Dr. Tanner adds that the stomach-pump or emetics must be employed. If the effects are not very severe, they will generally cease spontaneously.

Dr. Brunton's antidotes to poisoning by Lobelia are, a purgative; demulcents; stimulants; tannin; strychnine, hypodermically (5 mins. liq. strych.).

HEATH FAMILY (*Ericaceæ*).—This is a large family, and divided into tribes by botanists. One supplies the bilberry, whortleberry, and cranberry, which bear edible fruit. Another includes the heaths and ling; but the only one which calls for attention is that which contains the common Garden Rhododendrons and Azaleas.

In the flowers of these plants the calyx is almost entirely wanting; just a rudiment with five little points remains. The corolla is somewhat irregular, and having the posterior petal spotted. Such spots and streaks in flowers are regarded as “guides” or “path-finders” to insects, to lead them to find the exact position of the honey-glands. The stamens, five or ten, are “declinate,” that is, they first bend downwards and then upwards, in order to bear the weight of the insect which alights upon them, since there is no petal exactly in front for them to stand upon.

Contrary to the usual rule—that when the petals are coherent, the stamens may be expected to be adherent to the corolla-tube—the stamens are quite free from the corolla, arising directly from the floral receptacle.

The pistil has five coherent carpels, forming a capsule when in fruit.

RHODODENDRON (*Rhododendron*, sp.).—Numerous species and hybrids of this genus are in cultivation, as well as others of the same tribe (*Rho-*

doreæ). They all possess acrid narcotic properties. Thus *R. chrysanthum*, a small shrub of Siberia, has stimulant and narcotic virtues. The leaves are used in infusion for rheumatism in Siberia. *R. ferrugineum* of the Alps resembles it in its properties.

The sub-genus *Azalea* has a species (*A. Pontica*) which is possessed of highly narcotic properties. It has been suggested that it was the honey of this plant which caused so much destruction in Xenophon's army in the retreat of the Ten Thousand. It is said that the honey collected from this plant has the same effect on the system as Darnel (*Lolium temulentum*). It grows abundantly in Asia Minor and in the neighbourhood of the Black Sea; and it is stated that goats which eat the leaves suffer in consequence, and that it is fatal to cattle and sheep.

Kalmia latifolia is frequently grown in shrubberies, the flower of which is remarkable for having the stamens bent down and thrust into little pockets in the corolla. It is one of the most dangerous of the whole family. It is found all over the United States, and is there called Mountain Laurel. The leaves are narcotic and poisonous. Death has occurred from eating the flesh of partridges and pheasants which have fed on them—presumably the buds or seeds—during the winter.

Similarly the flesh of hares which have been

feeding on *R. chrysanthum* has been considered to be poisonous.

Ledum palustre (of Europe) and *L. latifolium* (of N. America) are two species of small shrubs, and grown in gardens. They can scarcely be called poisonous plants; indeed the second is called Labrador Tea, as the leaves are used for an infusion; but still, the leaves of both species when infused in beer render it very "heady," and cause headache, nausea, and even delirium; showing that they contain some deleterious principle.

PRIVET FAMILY (*Oleaceæ*).—The only members of this family, natives of Great Britain, are the Privet and the Ash-tree; but the Lilac, Phillyrea, and Jessamine (if this last be included, as some botanists place it) are familiar garden flowering shrubs, all having opposite leaves.

The calyx has four coherent sepals; the corolla has four coherent petals. There are only two stamens adherent to the corolla and a pistil of two coherent carpels. The latter forms a berry in the privet, a stone-fruit or "drupe" in the Olive, a bursting capsule in the Lilac, and a winged indehiscent fruit called a "samara" in the Ash. This tree is remarkable for having no calyx or corolla, only the two stamens and pistil; sometimes each is alone, thus forming male and female flowers; sometimes they are together.

PRIVET (*Ligustrum vulgare*).—This is not

generally regarded as a poisonous shrub ; but Dr. Taylor records a case in which three children ate the small black berries of this bush. They suffered from violent purging. A boy and a girl died, but the third child, also a girl, recovered, as she had only tasted, but had not apparently swallowed any, or at all events enough to harm her.

PRIMROSE FAMILY (*Primulaceæ*).—Taking a primrose or cowslip as a type of this family, the structure of the flower is as follows. The calyx has five sepals coherent into a tube. So has the corolla. The five stamens are situated *in front of* the petals. This is so unusual that it calls for an explanation. The law of alternation between the positions of the whorls signifies that a whorl of stamens has been suppressed between the corolla and the existing whorl ; so that the parts may be represented thus :—

S.	S.	S.	S.	S.
P.	P.	P.	P.	P.
*	*	*	*	*
St.	St.	St.	St.	St.
C.	C.	C.	C.	C.

where S. stands for sepals ; P. for petals ; * arrested stamens ; St. existing stamens, and C. for carpels.

In the primrose and cowslip the stamens and pistils are "dimorphic," that is, of different lengths

in the flowers of different plants, forming the popular distinction of thrum-eyed and pin-eyed. The anthers of the stamens are situated high up in one and low down the corolla-tube in the other kind of flower; the pistils have the lengths of their styles correspondingly graduated, so that they are adapted for being crossed.

This arrangement does not exist in all species of primrose, nor is it in all other genera of this family. Under cultivation and certain circumstances in the wild state, the stamens and style may be of the same length in the same flower, though such be normally dimorphic.

PIMPERNEL, or POOR MAN'S WEATHER-GLASS (*Anagallis arvensis*).—This is too small a plant to be eaten in any quantity by animals; but experiences abroad have shown that it certainly contains injurious properties, which neither drying nor boiling destroys. It is said that some horses were killed at Lyons by means of it. It has also caused cage-birds to die from their having eaten it when given to them in mistake for chickweed. This plant had a reputation for curing hydrophobia, but no such property is really attached to it. It is said that sheep refuse to eat it. An extract made from it is very powerful and poisonous.

CYCLAMEN (*Cyclamen* sp.).—We have one species of this plant which has established itself in woods in Kent and Sussex. The cultivated species is

known as *C. Persicum*. It forms a large globular tuber, which in Sicily is eaten by swine ; hence it was formerly called Sowbread. In a fresh state it is acrid and bitter ; but when dried its acidity is diminished, and when roasted it becomes perfectly harmless. It acts as a violently drastic purgative, and is emetic. It is sometimes used, but often with serious results, accompanied by internal inflammation and even terminating in death. It is singular, writes Dr. Hogg, in addition to the preceding details, that while pigs can eat any quantity of the tubers with impunity, the juice acts as a poison on small fish, if mixed with the water in which they are, in the very small proportion of 1 in 3000. The active properties reside in a principle called *Cyclamine*, a powerful poison, producing effects similar to those of Woorari, which the Indians of Rio Negro use for poisoning their arrows.

CONVOLVULUS FAMILY (*Convolvulacæ*).—The members of this family are mostly climbers ; but when a genus has species of which some live in shady woods, the other in hot, dry deserts, the former climb, but the latter do not ; such habits being adaptations to two very different conditions of environment.

The form of the corolla is like the mouth of a trumpet, and various kinds of convolvulus must be familiar to all.

They generally have a milky juice and an acrid taste, so that cattle will not touch them. Pigs have been known to eat the roots of the white-flowered hedge convolvulus, with bad results. In fact all of our three wild species, the one mentioned, the Lesser Bindweed, and the *Calystegia* of our sandy sea-shores, have all an actively cathartic principle.

It may be added that the popular remedy "Jalap" is the root of a Mexican species, deriving its name from the town Xalapa.

On the other hand, the Sweet Potato largely imported from Spain before the true potato was introduced in the sixteenth century, is another member of the family (*Batatas edulis*), the name giving rise to "potato," which belongs to a totally different family.

One genus called Dodder (*Cuscuta*) is parasitic, resembling yellow threads bearing globular tufts of flowers; it is frequent on gorse, clover, etc. The species partake of the same properties as *Convolvulus*.

POTATO FAMILY (*Solanaceæ*).—Four genera represent this family in Great Britain, *all* of them being poisonous; viz. Henbane, Deadly Nightshade or Belladonna, Woody Nightshade, and the Black-fruited Solanum. The Thorn-apple was introduced from North America.

WOODY NIGHTSHADE, or BITTERSWEET (*Sola-*

num Dulcamara).—This is a familiar plant, scrambling or climbing over our hedges, with single or trifoliate, oval leaves. Clusters of purple flowers arise from a point in the stem *above* a leaf, and not as usual from its axil. There is a small calyx of five coherent sepals; a corolla of five coherent petals carrying the five adherent stamens. The anthers are sub-coherent, forming a cone and dehisce by terminal pores. The pistil of two carpels becomes an oval scarlet berry.

There is a deleterious principle called *Solanine*, which is found in all the species of *Solanum*. As it occurs in the stem and leaves of the Bittersweet—this name being derived from the taste of the stem, being at first bitter, followed by a sweetish flavour—these parts must be regarded as suspicious; indeed, they have been proved to have narcotic properties, producing giddiness and sickness when eaten.

With regard to the berries, there is no doubt that they are very harmful. Two children died a short time ago near Birmingham who had been eating a variety of berries, including the poisonous ones of Lords and Ladies (*Arum maculatum*), and also those of the Woody Nightshade. Moreover, evidence of the presence of the poisonous principle *Solanine* was detected.

Solanine is especially connected with the *green* parts; so that even if the ripe berries proved

innocuous in some cases, as has been asserted, children and others would very probably suffer if they ate them at all green. The principle acts as an acro-narcotic poison. It is retained in the British Pharmacopœia, but apparently not often employed.

BLACK SOLANUM (*Solanum nigrum*).—This is a small annual plant, about one foot to eighteen inches high, and is often a troublesome weed in ill-kept gardens, if allowed to scatter its purple-black, globular berries. It exhales a disagreeable odour. Solanine exists in the fruits. Children have suffered by eating them on the Continent, though they are sometimes harmless to adults, at least in this country, as Solanine is not very abundant in the stem and leaves, which had no effect upon a horse.

Three children are recorded as having eaten the berries of the Black Solanum, and suffered from vertigo, dilated pupils, nausea, colic, stertorous breathing, and convulsions.¹

POTATO (*Solanum tuberosum*).—The potato plant contains the same principle, Solanine; which, since it is mostly in connection with green parts or chlorophyll, potatoes which have been insufficiently covered and become green, should never be eaten.

¹ Dr. Tanner says :—To prevent a fatal result from Henbane or Nightshade, we must trust to emetics and full doses of castor-oil.

The tubers contain it least of all the parts of the plant; and when potatoes are boiled, the deleterious principle is not destroyed, but passes out into the water.

No injury to man has ever been recorded from the Solanine of potato plants; for it is only the harmless and useful tubers that are eaten. The skins, which contain the most of it, are peeled off.

On the other hand, accidents with animals are not at all uncommon. Cattle have suffered most, and even dogs have suffered when fed exclusively on potatoes. Cows will eat raw potatoes, sometimes given under the impression that it increases the milk; but they have been known to suffer in consequence; as also by the foliage when given to them in times of scarcity of forage.

AUBERGINE (*Solanum Melongena*).—As in potatoes, the same principle is associated with chlorophyll; so the purple fruits only of this plant should be eaten, and all half-ripe or green ones avoided.

Besides the species mentioned, others are often cultivated, and are probably more or less dangerous. There is one which becomes a tree on the Continent, and is not infrequently grown in conservatories, popularly known abroad as *Trompette du Jugement*.

The Egg-plant, Mad-apple or Jew's-apple (*Solanum esculentum*) is a native of the East Indies, and sometimes cultivated. It produces a fruit the

size and form of a hen's egg, generally white. They are used in the South of Europe raw or cooked ;



Fig. 30. *Atropa Belladonna* ; Deadly Nightshade.

but if eaten in excess are described as producing injurious effects.

DEADLY NIGHTSHADE (*Atropa Belladonna*, Fig. 30).—This is a perennial herb, between three and

four feet in height, branching with rather large leaves finely pubescent or downy, oval and pointed. The flower has a tubular corolla of a purplish-blue colour. The rather large berries are shining and black, when ripe (see figure).

The Belladonna is very poisonous ; the berries, which are intensely sweet, having caused many mishaps among children ; though of all its parts the berries are the least rich in active principles, as compared with the roots, which are the most active ; and the stem, leaves, and flowers, which take an intermediate position.

Drying does not destroy the poisonous properties.

Men and animals suffer alike from the Belladonna, but in different degrees. Man is most susceptible, after him are the cat, bird, and dog ; the horse is less affected by it. The pig, goat, sheep, and rabbit are but little sensible to its action ; but only in consequence of a more rapid elimination of the poison.

The same remark applies to *Cytisine* of the Laburnum.

An adult person has eaten two or three berries without injury, but beyond that dangerous symptoms are experienced ; but it has been recorded that, on one occasion, a fatal result did not follow the consumption of thirty berries. Fortunately the principle is of itself an emetic.

Children are always more susceptible than adults.

The effect of this plant, writes Mr. Johnson, is peculiar in causing, first great excitement, and afterwards stupefaction and death. The pupil of the eye is usually much dilated. A remarkable case of poisoning occurred in 1806, when the berries were sold in London as edible fruits by some ignorant dealers. Two persons who partook of them died, and others narrowly escaped.

It was probably the Belladonna which proved disastrous to some troops under Mark Antony as described by Plutarch. He says that those who sought for herbs obtained few that they were accustomed to eat, and in tasting unknown plants they found one which caused insanity and death. He that had eaten thereof immediately lost all memory and knowledge ; but at the same time would busy himself in turning and moving every stone he met with, as if he were engaged in some very important pursuit. The camp was filled with unhappy men bending to the ground, and digging up and removing stones, till at last they were carried off by a bilious vomiting, when wine, the only remedy, was not at hand.

In modern times it is reported that one hundred and fifty soldiers suffered from the ill effects of this plant in the early part of last century.

Dr. Tanner observes that there is often a disposition to laugh and talk loudly, to have fanciful delusions, with a difficulty of walking ; symptoms

somewhat resembling those of poisoning by the mandrake, another species of the same genus.

Mr. Blyth says that the Deadly Nightshade contains not only its own poisonous principle, *Atropine*, which is the same as that of the Thorn-apple, *Daturine*, but *Hyoscyamine* as well, characteristic of the Henbane. The young roots contain the last only, while the older have *Atropine* in addition. The ripe berries contain both, if cultivated, but the wild berries have only *Atropine*.

The seeds are very small, kidney-shaped, covered with small, round projections. Mr. Blyth gives statistics of poisoning by *Atropine* for ten years ending 1892. The total number was seventy-nine. Twenty-nine were suicidal, the rest accidental, and almost invariably the result of mistakes in pharmacy. It is children alone who have eaten the berries of *Belladonna*, and leaves or seeds of *Thorn-apple*.¹

The late Dr. B. W. Richardson considered the drug administered to Juliet was *Mandragora*, allied to our *Deadly Nightshade*; as, contrary to

¹ Dr. Brunton gives as antidotes to poisoning by *Belladonna* and also by *Thorn-apple* (*Datura Stramonium*), stimulants and coffee; inject caffeine subcutaneously; arouse from stupor, as in opium poisoning; and, if necessary, artificial respiration.

Dr. Tanner suggests the use of emetics and purgatives to free the intestine. Mr. Blyth, besides these, adds an enema of coffee. Hot water to the feet and alternate douches of cold and hot water are found useful.

the usual descriptions of the actions of poisons by Shakespeare, which, he noted, are generally wrong, that of the Mandrake is correct. It was used as a narcotic anæsthetic by the ancients, for patients undergoing amputations, and not discarded until the fifteenth century. A wine was made from it called "Morion." The Mandragora was taken by some people, as many do opium now, and they were called Mandragorates. In the period of their recovery from the intoxication they shrieked. Shakespeare, however, refers to the popular misapprehension that it was the *root* which shrieked when drawn out of the ground.

THORN-APPLE (*Datura Stramonium*, Fig. 31).—This is a North American plant, but is often found wild on waste ground. A variety with purple flowers called *D. Tatula*

is sometimes cultivated. They are large plants, but annuals, much branching in a forked manner. The leaves are large, with a wavy and toothed margin; the flowers are three inches long, white, with a folded



Fig 31. *Datura Stramonium*; Thorn-apple.

and only half-opened corolla. Unlike the preceding members of the Potato family, this and the Henbane have capsules and not berries. The Thorn-apple derives its name from the fruit being covered with spines. When ripe it bursts into four valves, leaving a large central structure upon which are several black rough seeds.

The whole plant is poisonous, but the seeds are the most active ; neither drying nor boiling destroys the poisonous properties.

Among human beings the greater number of accidents have occurred among children who have eaten the half-ripe seeds, which have a sweetish taste.

Browsing animals refuse to eat the Thorn-apple, being repelled by its disagreeable odour and nauseous taste.

The stem and leaves dried and smoked form a popular remedy for asthma ; but their employment is dangerous and doubtfully remedial.

It is said that the priests of Delphi used either this or some other species of *Datura* to produce their semi-delirious paroxysms, believed by the populace as being of divine inspiration. It is thought to act more powerfully on the brain than *Belladonna*, and to produce greater delirium.¹

HENBANE (*Hyoscyamus niger*, Fig. 32).—This is

¹ The same remedies are recommended as for *Belladonna* or *Deadly Nightshade*, note, p. 122.

an annual, which, like the Thorn-apple, frequents waste grounds. It grows about a foot in height, is densely hairy and sticky. The leaves are large



Fig. 32. *Hyoscyamus niger*; Henbane.

and deeply indented. The corolla is of a yellowish colour, and has the veins pencilled of a violet tint. The form is funnel-shaped. The capsule is

embedded in the persistent calyx (see central figure), and dehisces by means of a lid, or what is called a "circumscissile" manner. It has numerous very poisonous seeds.

The whole plant is characterized by a very "heavy," nauseous odour. It is poisonous in all its parts ; and neither drying nor boiling destroys its noxious properties.

Having a thick root, this has been eaten instead of parsnips and chicory ; and children have eaten the seeds. As a rule no animal will touch the plant ; but cows have been poisoned by having the Henbane mixed with their forage, it is said for the purpose of fattening them. A small quantity of the seeds of the Stramonium, as well as of Hyoscyamus, are sometimes added. The idea appears to be that the tendency to stupor and repose caused by these plants is conducive to fattening.

In the case of man, twenty seeds were insufficient to prove fatal, though they induced grave results. The effects are the same as in poisoning by Atropine of Belladonna.¹

It is recorded that the whole of the inmates of a monastery were poisoned by using the root instead of chicory.

Dr. Houlton states that the monks who partook of the roots had such hallucinations that the

¹ Remedies for poisoning by *Henbane* are the same as for *Belladonna*, note, p. 122.

establishment resembled a lunatic asylum. They rang the bell for matins at midnight; and those who attended were unable to read, or they read that which was not in the book.

The seeds possess all the properties of the plant; the smoke taken into the mouth through a tube, from seeds heated on a plate, was a favourite remedy for toothache in the Middle Ages. They are now sometimes smoked in a pipe.

The roots put into soup have also caused serious results.¹

TOBACCO (*Nicotiana Tabacum, rusticum*, etc).—Several species are cultivated on the Continent, and one (*N. affinis*) is frequently cultivated in England for the sake of its white and scented flowers.

Like poppies, the poisonous principle of the Tobacco-plant is not in the seeds, but in the foliage; yet the seeds of the Thorn-apple, of this same family, are very injurious.

The leaves when young are poor in the poisonous alkaloid, which increases as they mature, and in the autumn, the maximum amount being in early September. Climate has a great influence on its production, as well as the nature of the soil and the manures applied. Sandy soils with a clay

¹ Dr. Tanner observes that to prevent a fatal result from the use of *Henbane*, we must trust to emetics and full doses of castor-oil.

subsoil appear to induce the production of the most nicotine, as the leaves become thicker under these conditions.

Drying does not remove the deleterious properties. Nicotine is regarded as one of the most active and dangerous poisons known.

The principal cause of accidents on the Continent has been the injudicious use of lotions of the juice of tobacco for the destruction of parasites; and the practice of chewing it.

A similar usage of lotion for cattle has proved injurious, especially when it has been applied all over the animal; and if there be any abrasions on the skin, then the nicotine is rapidly absorbed at such lesions, and alarming symptoms follow.

The goat, though usually omnivorous, refuses to eat tobacco-leaves; but the ox, on the other hand, is said to delight in it, especially when dry, and has been poisoned, having been attracted to it by the odour, as the following case shows. A peasant in the South of France hid some tobacco under straw in a shed, and his ox discovering it, ate the tobacco, and died the same day.

Another remarkable instance of tobacco-poisoning occurred some years ago in France. A man who attempted to smuggle tobacco into France, wrapped the leaves all about his body under his clothing. The weather being hot, and having to walk some distance, he was thrown into a

violent perspiration. The consequence was that an absorption of the poisonous property of the tobacco-leaves took place. He was taken seriously ill on the way, discovered by the Custom-house officers, and subsequently died.

Tobacco for smoking was introduced into Europe about 1560, Jean Nicot (whence the name *Nicotiana*) having sent the seeds to Catherine de Medici. It did not come into general knowledge till 1586; when Sir Walter Raleigh, as well as the settlers who returned from Virginia, introduced it into England.

Tobacco met with a determined opposition from European governments, who attempted to restrain its use by penal enactments. In Turkey all found guilty of smoking were condemned to death. In Moscow the knout was the punishment for the first, and death for the second offence. In other parts of Russia smokers had their noses cut off.

More than a hundred books were published in condemnation of tobacco.

The following is a specimen of King James's *Counterblaste* against the use of tobacco:—

“ Now to the corrupted baseness of the first use of this Tobacco, doeth very well agree the foolish and groundlesse first entry thereof into this kingdome; it was neither brought in by king, great conqueror, nor learned doctor of physicke. With the reporte of a great discovery for a conqueste,

some two or three savage men were brought in, together with this savage custom, but the pitye is, the poore wild barbarous died, but that the vile barbarous custom is yet alive, yea, in fresh vigour. Surely smoke becomes a kitchen farre better than a dining chamber, and yet it makes a kitchen oftentimes in the inward parts of men, soyling and infecting them with an unctuous and oyle kind of soote, as hath been found in some great tobacco takers that after their death were opened."

With all his earnest and sincere attempts to stop smoking, King James does not appear to have succeeded.

Mr. Burnett wrote that it is supposed that the "juice of cursed hebenon," by which, according to Shakespeare, the King of Denmark was poisoned, was the essential oil of tobacco :—

" Sleeping within mine orchard,
My custom always of the afternoon,
Upon my secure hour thy uncle stole,
With juice of cursed hebenon in a vial,
And in the porches of mine ear did pour
The leperous distilment."

According to Gerarde, tobacco was called " Henbane of Peru," and no preparation of real henbane (supposed to be meant by "hebenon") would produce death ; but the essential oil of tobacco might do so.

Dr. Taylor records instances in which a large quantity of tobacco was consumed by smoking and death was the result. He mentions that eminent men consider that habitual smoking is injurious to health. Indeed, some have confessed it themselves, as they could not work at literary matters in consequence of lassitude ; and so gave up the practice. The reason is that it disorders the digestive functions.

A poisonous substance like tobacco, writes Dr. Taylor, whether in powder, juice, or vapour, cannot be brought in contact with an absorbing surface like the mucous membrane, without in many cases producing disorder of the system, which the consumer is probably quite ready to attribute to any other cause than that which would render it necessary for him to deprive himself of what he considers not merely a luxury, but an article necessary to his existence.

With regard to the effects of smoking upon the system, the following appears to be so important, that it is worth repeating here to show the connection between physique and nicotine :—"The instructors in athletics at the universities of Yale and Amherst have been making some interesting observations with reference to the effects of smoking upon the physique of the college students. We do not know whether those who conducted these inquiries entered upon them with any prepos-

sions or prejudices, but there appears no reason to suppose that the observations were not fairly made and accurately recorded. The consensus of results in the two institutions is decidedly unfavourable to the use of the weed. Dr. Seaver, who conducted the experiments at Yale, found that those students who did not use tobacco showed a gain over those who were addicted to its use of 20 per cent. in height, 25 per cent. in weight, and 66 per cent. in lung capacity. Dr. Seaver has kept up his observations for eight years, and finds that they show an equally decided advantage for non-smokers during the whole period. A fact which seems to afford an incidental but remarkable confirmation of the conclusions thus reached by actual measurements is that not only do all the boating crews abstain from tobacco, but that among the whole body of competitors in the different fields of athletics there is but one smoker. At Amherst the study of effects was in the case of the graduating class. In this class the measurements and tests showed that 71 per cent. had gained and 29 per cent. had remained stationary or fallen off during the last four years. Separating the smokers from the non-smokers, it was found that the latter had gained 24 per cent. more than the former in weight, 37 per cent. more in height, and 42 per cent. more in chest-girth. Still further, those who did not use tobacco were found to have an advan-

tage of 8.36 cubic inches of lung capacity over the smokers. These statements, which we give on the authority of the *New York Nation*, may be accepted, we suppose, as scientific facts, and as such may be commended to the study of all lovers of the weed." ¹—*Toronto Week*.

PERIWINKLE FAMILY (*Apocynaceæ*).

PERIWINKLE (*Vinca major* and *V. minor*).—These two species represent the family among our wild flowers; though it is a little doubtful whether they are not naturalized from Europe. They belong to a family usually characterized by having poisonous, drastic, and purgative properties; though the Periwinkles themselves do not seem to be more than bitter to the taste, slightly acrid and astringent.

OLEANDER (*Nerium Oleander*).—This plant, so frequently grown on the Continent, is sometimes cultivated in conservatories for its beautiful single or double, white or rose-coloured flowers. It should be well understood, however, that it is a deadly

¹ For poisoning by *Tobacco*, Mr. Blyth's recommendations are as follows:—Unless the stomach has been already emptied by vomiting, use stomach-pump or tube, or give an emetic of mustard and plenty of water. Stimulants such as brandy may be given. Keep the body warm, but the cold-douche may be applied to the head. Tannin and vegetable infusions containing tannin may also be given; but it is questionable if they are of much use, unless any remnants remain in the stomach. Keep the patient lying down for fear of fatal syncope.

poisonous plant. The flowers are as harmful as other parts; thus a child ate a few of them, and in two days died.

During the Peninsular War, a number of French soldiers who went out foraging near Madrid, returned laden with the fruits of their search. One of the number, with the view of securing some wood to make skewers for the meat, cut a quantity of Oleander boughs, and having stripped off the bark, used the wood in the meat. The result was, that out of twelve who ate of the meat, seven died, and the rest were dangerously ill. The poisonous principle is said to be so subtle that its exhalations alone are sufficient to cause serious accidents, and even death, to those who sleep for any time under its influence.¹

DOG'S-BANE, or FLY-TRAP (*Apocynum androsæmifolium*), a native of the United States, as well as the so-called Indian Hemp (*A. cannabinum*); are both cultivated as garden plants. Neither can be strictly called poisonous, as no serious results have ever followed from their use as drug-plants; but the root especially has a strong nauseous odour, and an acid bitter taste.

FOXGLOVE FAMILY (*Scrophularineæ*).—This is a large family, characterized by always having an irregular corolla, but it takes various shapes as

¹ Mr. Blyth recommends the same treatment in the case of poisoning by *Oleander* as for *Digitalis* or *Foxglove*, p. 138.

in the familiar Foxglove, Toadflax, Snapdragon, Monkey-flower, Speedwell, etc.

GREAT MULLEIN (*Verbascum Thapsus*, Fig. 33).

—We have five other species of Mullein. This one is recognizable by its woolly foliage and yellow flowers in a dense spike. It stands intermediate between the Potato and Foxglove families; because while the former has a regular corolla with five perfect stamens, in nearly all other members of the present family one stamen is suppressed, so that there are usually four. In a few genera



Fig. 33. *Verbascum Thapsus*; Great Mullein.

they are still further reduced to two (*Calceolarias* and *Speedwells*). In *Mulleins*, the stamens are still five in number, but the posterior one is nearly, if not quite, abortive as represented in the top figure on the left. Moreover, the corolla has scarcely become more than very slightly irregular.

The soft, thick leaves boiled in milk and sweetened are employed in medicine as being emollient and pectoral; but the seeds possess

some toxic property, the nature of which has not been determined, which stupefies fish; and has, therefore, been used for this purpose to catch them.

As children so frequently put all kinds of seeds in their mouths, this plant should be avoided in that respect.

FIGWORT (*Scrophularia*, Fig. 34).—We have four species wild, but only two common (*S. nodosa* and *S. aquatica*). They have a disagreeable odour and a bitter taste. They were formerly credited as very valuable in the cure of scrofula. Hence arose the name of the genus and family as well.



Fig. 34. *Scrophularia nodosa*;
Figwort.

S. nodosa, found in shady and moist places, has a quadrangular stem, smooth and toothed leaves, small purplish flowers in a large terminal "panicle,"¹ and a capsular fruit. The rootstock is horizontal and tuberous.

The plant acts as an emetic and purgative with

¹ This is a technical term for any loose mass of flowers on the same central stem.

great energy ; fortunately animals will not touch it. The plant should be regarded as suspicious ; though no case of actual poisoning is known.

FOXGLOVE (*Digitalis purpurea*).—This handsome wild-flower, to be found in nearly every county, as well as cultivated, affords a valuable medicinal drug.

All parts of the Foxglove are poisonous, but the seeds are richest in the deleterious principle. The leaves are more active before flowering than afterwards. Under cultivation the principle is less active than in wild plants.

Neither drying nor boiling destroys the poisonous principle.

Several cases of poisoning by Foxglove have arisen from ignorant persons making an infusion or "tea" of the leaves ; but cases have occurred of careless administration of the drug.

No animal, not even goats, will ever browse upon the Foxglove.

Foxglove, or *Digitalis*, is so powerful in its action that, as Dr. Hogg observes, as a medicine it should never be administered unless by a skilful and practised hand, because of the danger resulting from an imprudent use of it. One of its peculiarities is that, after having been given in moderate doses for several days without apparent effect, it sometimes acts suddenly with an accumulated influence, even to the danger of life.

Indeed, Dr. Tanner records two cases in which death occurred within twenty-two hours after being administered medicinally.

To illustrate the folly of ignorant people doctoring themselves with fresh poisonous plants, a case is recorded by Mr. Blyth of a woman who took a large unknown quantity of the freshly-expressed juice of Foxglove for the purpose of relieving a swelling of the limbs. After suffering much she died on the twelfth day.¹

TOADFLAX (*Linaria vulgaris*).—This and five other species are natives. They are all acrid and poisonous; but no harm has ever been recorded as caused by them. Their odour and taste prevent animals from eating them. Little or nothing is known of their toxic principles.

LOUSEWORT (*Pedicularis sylvatica* and *P. palustris*), so called from an old use, but not now employed. The chief effects, if taken internally, are vomiting and purgation.

The first of our two species frequents shady

¹ For *Digitalis* or *Foxglove* poisoning, Mr. Blyth recommends emptying the stomach by emetics, sulphate of zinc or mustard. Follow up with strong tea, or half-a-drachm of tannic or gallic acid in aqueous solution. Stimulants in small doses may be given frequently by the mouth, or if there be vomiting by the bowel.

Dr. Brunton gives as antidotes, strong tea [or coffee with brandy to lessen the tendency to sleep (Tanner)]; tannins and stimulants. Aconite 5 mins. of the tincture, subcutaneously; and perfect quiet in bed.

places, is only eaten by animals when the plant is very young, but is refused afterwards, as also is the Marsh Lousewort at all times.

YELLOW RATTLE (*Rhinanthus Crista-galli*, Fig. 35).—This common parasite on grass-roots is easily known by its inflated calyx and yellow corolla (see figure).

This plant is refused by cattle when dried in hay. If the seeds are ground up with corn they impart a violet-brown colour to the flour. This is due to a property called Rhinanthine. It is not known whether this principle has really poisonous properties or not ;

but if so, it is probably only after prolonged usage.

COW-WHEAT (*Melampyrum pratense*, etc.).—We have four native species of this plant. Like the last they are parasitic upon grass-roots, and blacken when dried. *M. pratense* has yellow flowers, but in *M. arvense* they are red.

While green the field Cow-wheat is eaten by all animals, and is considered as hastening cows into milk. If the seeds be ground up with wheat,



Fig. 35. *Rhinanthus Crista-galli* ;
Yellow Rattle.

they impart a violet tint, a peculiar odour, and bitter taste.

With regard to ill effects, it has been observed that persons who have eaten bread contaminated with the seeds of the Cow-wheat have suffered from vertigo, but not invariably; so at present it remains only as a suspected plant.

BROOMRAPE FAMILY (*Orobanchaceæ*).

BROOMRAPE (*Orobanche minor*).—This species is parasitic on clover and several other plants.

It only calls for attention in consequence of its having been found to produce colic in animals fed on clover in which this leafless parasite grows in abundance.

Further researches are required to ascertain what injurious properties it may possess.

DIVISION IV

FLOWERS INCOMPLETE ; COROLLA WANTING ;
SEXES OFTEN SEPARATE

DOCK FAMILY (*Polygonaceæ*).—The genus *Polygonum* has twelve British species. It has a calyx of five sepals, a variable number of stamens, and a pistil of two or three coherent carpels forming a little nut-like fruit.

Many are readily eaten by animals, but others, as the hot-tasting Water-pepper of our ditches (*P. Hydropiper*), are refused by them. The very astringent Bistort (*P. Bistorta*) is only eaten by certain animals, as the horse, and *P. amphibium* by cows.

BLACK BINDWEED (*P. Convolvulus*).—This is the only species to which any special attention need be drawn. It is very common in cornfields; the stem climbs up the stalk of the wheat, and apart from its flowers, closely resembles the Lesser Bindweed (*Convolvulus arvensis*). If the seeds of this plant are too much mixed with oats, it has been found that, after a considerable period, serious internal derangements follow.

Polygonums are bitter, rich in tannin ; but they are not otherwise known to be poisonous.

DOCK (*Rumex*, sp.).—Those species which have an acid flavour are called Sorrels. Of these we have two species, the common Sorrel (*R. Acetosa*) and the Sheep's-sorrel (*R. Acetosella*, Fig. 36). They are both dioecious, the male flower having a calyx of six sepals and six stamens ; the female has a similar calyx, with a pistil carrying three feathery stigmas (see figure on the right) adapted to wind-pollination.

The acidity is due to the presence of binoxalate of potash, sold as salts of lemon or of sorrel ; and in that form it is very poisonous. It is useful for removing the stains of ink (made from oak-galls) from linen.

The little plant known as Sheep's-sorrel is common in sandy districts, heaths, etc. It is called by this name under the impression that sheep will eat it with avidity ; but veterinary doctors charge it with having poisoned both horse and sheep which browsed upon it when the fruit was ripe and full of seeds. Most serious disorganizations coupled with internal inflammation and finally death are described of the horse ; but at present chemists have not tried to discover if the Sheep-sorrel's has any poisonous properties at all, beyond its acidity.

Instances of poisoning by the common Sorrel (*R. Acetosa*) have usually been only with children who

have eaten considerable quantities of the leaves; for it is not at all dangerous as a salad herb, in soups, or in other culinary preparations. However, the habit of eating all sorts of leaves by boys should be rigidly restrained.

Oxalate of lime exists in large quantities in the leaves and stalks of Garden Rhubarb (*Rheum* sp.) of this family. It is said that the free consumption of this plant has more than once produced symptoms of intestinal irritation, and even gastritis (Tanner).¹

BUCKWHEAT (*Fagopyrum esculentum*).—This plant is occasionally cultivated in England, but to a much greater extent upon the Continent for the sake of the nutritious seed for the use of poultry, and also for bread among the humbler classes. Apart from a certain indigestibility, there is nothing else objectionable. But a very curious result follows from animals eating the flowering



Fig. 36. *Rumex Acetosella*; Sheep's-sorrel.

¹ For remedies for poisoning by *Salts of Lemon* and common *Sorrel*, see under *Wood-sorrel* (*Oxalis Acetosella*), p. 64.

tops of the growing plants, as well as the haulm when given with oats to horses, but especially to sheep, to which the haulm is given both as fodder and litter. The effect is a sort of temporary madness ; for as long as they were within a covered sheep-fold they were all right, but when taken out into the cold air for three hours, they became agitated. Their heads and ears became swollen, and they tried to strike their heads against the walls. On being driven back they soon recovered.

The flowering tops produce similar effects, and it is said that hares, if they have been eating them, become an easy prey to the dogs, for they stagger as if intoxicated. Swine suffer in the same way, and butt against each other furiously.

Though the stems and grain have been analyzed carefully, nothing has been discovered to which these alarming results can be attributed.

The nearest comparison appears to be the Indian Hemp, which produces very similar results, as seen in a man who, under its influence, is said to "run amok." Hence the word "hashish" has given rise to our "assassin" ; that being the Arabic name for hemp.

ARISTOLOCHIA FAMILY (*Aristolochiaceæ*).—There are two species of this foreign genus which are not infrequently met with in gardens.

BIRTHWORT (*A. Clematitis*) has erect, tubular,

green-yellow flowers. The plant is herbaceous, about one and a half feet in height.

It has a very disagreeable odour which repels animals, but it is occasionally eaten in forage on the Continent, and imparts its flavour to milk.

Taken in large quantities, it has injured horses when mixed with lucerne, inducing all the appearances of poisoning. The recovery was slow. The effects are attributable to a bitter principle which has been extracted, called *Aristolochine*.

DUTCHMAN'S PIPE (*A. Siphon*) is a North American plant climbing up walls, etc., having large round leaves, and yellow and purple tubular flowers. It has probably the same principle as the former.

ASARABACCA (*Asarum europæum*).—Mr. Bentham includes this in our British flora, as it occurs in woods and shady places, and is believed to be a true native in the North of England and Wiltshire.

It has an inferior ovary like the *Aristolochia*, but only a short tubular greenish-brown calyx; within it are twelve stamens, and six stigmas to the pistil. The leaves are heart-shaped, arising from a creeping rootstock.

This plant has long enjoyed a reputation as an emetic and purgative. The root has an acrid taste. The leaves are acrid and nauseous. The root has been found to contain an acrid, volatile principle, similar to that of the poisonous Cuckoo-pint

(*Arum maculatum*). The plant is called *cabaret* in France, as it is employed as an emetic by drinkers among the lower classes.

The DAPHNE FAMILY (*Thymelacæ*).—Two species of a single genus, *Daphne*, represent this family in Great Britain.

MEZEREON (*Daphne Mezereum*).—This is a small shrub about a yard high, with numerous rose-red flowers and scarlet berries. The leaves appear after the flowers. It occurs in copses and woods, but has long been grown as a garden plant. The flowers of *Daphne* consist of a tubular calyx of four coherent sepals, carrying eight stamens in two rows; and a pistil of a single carpel, which becomes the berry.



Fig. 37. *Daphne Laureola*; Spurge-laurel.

All the parts of this, as well as of the next, our only other species, are acrid and poisonous.

SPURGE-LAUREL (*D. Laureola*, Fig. 37).—The attractive berries of this plant have been the cause of many mishaps among children.

Drying does not destroy their poisonous property.

The bark is very acrid, and if applied to the skin causes eruptions. If put in the mouth and masticated, it produces a sensation of burning, and if swallowed, it has drastic and narcotic effects. It has even proved fatal to children. No animal will touch it.

In addition to the acidity characteristic of both the *Daphnes*, the berries act in a manner somewhat similarly to Monkshood and the Deadly Nightshade. As the irritant action is the greatest danger, the subjoined remedy should be given.¹

The MISTLETOE FAMILY (*Loranthaceæ*).— Though the foliage is often given to animals as fodder on the Continent, particularly to ruminants, who like it, yet the berries appear to have injurious effects. A case is on record of a little boy who ate some dozen of the berries, and the symptoms were those of alcoholic poisoning. Their glutinous character can hardly render them very attractive, but they are certainly to be avoided.

SPURGE FAMILY (*Euphorbiaceæ*).—We have only three genera of this family in Great Britain, viz. twelve species of Spurge, the Box, and two species

¹ Antidote to poisoning by *Mezereon* and *Spurge-laurel* (*Daphne*):—Gruel and barley-water should be taken to encourage the vomiting the berries occasion; and castor-oil in preference to other cathartic medicine.

Dr. Tanner says:—Emetics, unless spontaneous vomiting has freely taken place, when it may merely be encouraged by the use of diluents. If the poison has entered the intestine it must be removed by castor-oil.

of Mercury. The family contains many tropical plants and trees; some, such as the Manchineel, being deadly poisonous.

SUN SPURGE (*Euphorbia Helioscopia*, Fig. 38).— This is a common species. Like all the rest it has an acrid milky juice, used as a popular remedy for warts. The inflorescence consists of an umbel of radiating peduncles, with a whorl of toothed leaves below it. The ultimate pedicels carry the “flowers.” They consist of a little cup-like structure provided with five rounded glands on the edge. This is *not* a calyx, but an involucre of coherent bracts. Within it are a number of distinct flowers, reduced to their simplest elements. Thus, there are numerous male flowers, each consisting of a single stamen, jointed to its pedicel, which arises from the axil of a bract (see the figure of the Caper Spurge, Fig. 39). Associated with these male flowers is one female, consisting of a pistil of three coherent carpels with cleft stigmas. It is supported on a long stalk, so that it hangs out over the edge of the “involucral cup” (see figure, top). This becomes a capsule, the three carpels bursting elastically when ripe.

Besides being used for warts, this species, also called Wart-wort, Churn-staff, Cat's-milk, has been improperly employed to cure sore eyelids, causing, in many instances, intolerable pain and inflammation.

CAPER SPURGE (*Euphorbia Lathyris*, Fig. 39).— This is really a continental species, but has long been cultivated; and is now naturalized as a weed in the vicinity of gardens. It has opposite smooth leaves of a bluish-green hue. The structure of the flowers is the same as in other species, only the



Fig. 38. *Euphorbia Helioscopia* ;
Sun Spurge.



Fig. 39. *Euphorbia Lathyris* ;
Caper Spurge.

glands on the edge of the involucrel cup are crescent-shaped. Its unripe fruit resembles that of the common garden Nasturtium (*Tropæolum majus*), and like that, it has been used for pickling purposes. As of all other species of *Euphorbia*, the milky juice is very acrid. The seeds, as of so many euphorbiaceous plants, yield an oil which is

violently purgative, like Croton oil. It speedily becomes rancid, and has then a disagreeable action.

When green the ovary of the three-lobed pistil contains the poisonous milky sap, and is very acrid ; but after having been steeped in salt-and-water, and then in vinegar, the poisonous property becomes neutralized, or at least reduced in its virulence, so as to render it inert in the amount of the pickle usually eaten.

Since, however, it has no advantage—rather the reverse—over other vegetables, the practice of pickling it should be discountenanced. The milky juice which characterizes all the species is acrid and poisonous, while the seeds contain an extremely purgative oil, called “oil of euphorbia.” This is very well known in the genus *Ricinus*, or Castor-oil plant, and in the Crotons, both belonging to this family.

On the Continent peasants not infrequently use the seeds of the Caper Spurge as purgatives, but have suffered in consequence.

Only very young animals eat it. Older ones refuse it. Nevertheless cases of their having been poisoned by it are recorded. The goat, however, is said to be nourished on it, but the milk of such goats conveys the deleterious properties to the consumer.

The juice of Spurges applied to the skin acts as an irritant and vesicant, whether outside or in the

digestive canal, and also causes other graver symptoms; yet instances of its poisoning children are not wanting. In one case a boy died from eating the Petty Spurge (*Euphorbia Peplus*), one of our small species, growing from six to ten inches in height. In a second case a boy died after eating the Sun Spurge (*E. Helioscopia*), already referred to as another common field weed; in both instances the mouth, throat, and stomach were found to be in a highly inflamed and corroded condition.

The roots and seeds of species of *Euphorbia* have been used by quack doctors and ignorant country folk with disastrous results, so that the whole tribe should be carefully avoided.

MERCURY (*Mercurialis perennis*, Fig. 40, and *M. annua*).—The first of these two species is very common in shady places, hedgerows, etc., covering large spaces of ground by means of its creeping stems. The second is a not uncommon garden weed, but much more abundant on the Continent.



Fig. 40. *Mercurialis perennis*; Mercury.

Both species are diœcious ; the male plant having its flowers on long peduncles. Each flower consists of a calyx of three sepals with about nine stamens. (see left-hand figure).

The female flower has a similar calyx, two rudiments of stamens, represented by filaments only, and a pistil of two coherent carpels with spreading stigmas (see right-hand figure); the pistil becomes a bilobed nut-like little fruit (see figure above female flower). Mercury has no "latex" or milky juice, but it contains a poisonous principle.

It exhales a disagreeable odour, so that animals rarely eat it, but only when given to them mixed with other herbage, when it has proved fatal to sheep. In the case of man, misfortunes have only occurred through misuse of the plant as a drug. As, however, heat destroys the injurious property, it is innocuous in hay, and can be also eaten as a boiled vegetable, as is done in some parts of Germany. After boiling, it is also given to pigs in parts of France.

Yet it is a decidedly harmful plant ; the juice is emetic and the seeds dangerously purgative ; even fatal results have followed its use.

The annual species has been called Wild Spinach in some parts of the country, where they boil it as a pot herb ; the botanist Ray records a case in which a whole family of five persons suffered

severely from eating it fried with bacon. Some fishermen ate it with soup, and all were seriously ill an hour after the meal, showing all the symptoms of narcotic irritant poisoning. Two of the children died the next day.

BOX (*Buxus sempervirens*).—This is a native of Box-hill, but has been grown as a garden shrub since the times of the ancient Romans, who made hedges with it, often cutting it into fanciful shapes, or what is called topiary work. The wood is very close-grained, so that it has been invaluable for wood-engraving.

All parts of the Box emit a disagreeable odour and taste, being bitter and nauseous, and have affected both men and animals. With the former it has generally been the result of a fraudulent use of Box-leaves instead of hops in beer, and in mixing them with senna-leaves.

Animals have injured themselves by browsing upon Box shrubs, especially in arid districts deficient in proper herbage. Camels in Persia have thus suffered. In Western Europe the cuttings of the dwarf box edgings have poisoned animals, even pigs have died from eating them, as it is the leaves and bark especially which contain the poisonous principle, which is emeto-purgative, and can be fatal in its effects. Whether the flesh of animals poisoned by Box can communicate the deleterious property to man, is not known for certain.

It is said that the porcupine of all animals is the only one which can eat Box with impunity.

CASTOR-OIL (*Ricinus communis*).—This plant is often cultivated for its handsome foliage. It is an annual in this country, but grows to a good-sized tree in the South of Europe.

The value of this plant resides in the oil extracted by pressure from the seeds. The oil itself is of a mild aperient nature; but the refuse of the crushed seeds, or the whole seeds themselves are much more injurious.

Cases of poisoning have occurred by children eating the seeds, mistaking them for haricot-beans or pistachio-nuts, and ignorant herbalists have administered them instead of the oil. Even four seeds caused grave results, and eight, death.

Very frequent poisoning of fowls and pigs has occurred on the Continent, and eighty sheep were on one occasion lost by their eating the refuse from the oil-crushing, inadvertently given to them.¹

¹ Dr. Tanner observes as to the treatment of patients suffering from such irritants as *Euphorbium*, excess of *Castor* and *Croton* oil seeds:—The treatment must be directed to the removal of the injurious substance by emetics, etc., unless spontaneous vomiting has freely taken place, when it may merely be encouraged by the use of diluents. If the irritant has passed out of the stomach into the intestines, it must be carried off by purgatives, especially by castor-oil. The inflammatory symptoms should be cautiously combated, on account of the great prostration usually caused by these poisons. Opiates, emollient enemata, and fomentations to the abdomen will subsequently be found useful.

THE OAK FAMILY (*Cupuliferae*).

BEECH (*Fagus sylvatica*).—The beech-masts when deprived of their husks are perfectly harmless ; *i. e.* the embryo can be eaten with impunity ; but it has been found that when they have been crushed for the sake of the oil they contain, and the refuse or husks have been made into cakes for cattle, they suffer from some very deleterious principle which resides in the husks alone. They can eat the foliage of the beech, but not the husks of the masts.

OAK (*Quercus Robur*).—The only part of this tree to which attention need be called is the leaves, and especially in a young state.

In early spring, at a time when the supply of forage is well-nigh exhausted, it is the custom abroad to send the cattle into the forests. The animals having been for weeks confined to dry food, eat with avidity the young shoots and leaves of the trees.

After some days there appear, first upon the younger animals and especially upon those of a thin skin with white hair, then upon the milch cows, and finally upon all, signs of a malady long known and described under the characteristic name *Maladie des bois*.

The animals, with a good appetite at first, eat less and less ; they ruminate but little and with

difficulty. They remain lying down for a long time. The supply of milk fails. Fever follows and other serious troubles ; in some cases so violent are they that death ensues.

It is found that not only the oak but the hornbeam, the hazel, the privet, the furze and the broom in the young condition are apt to produce similar complications. Now all these contain tannin when the foliage is full grown—but then this product is perfectly harmless: so that the belief at present is that certain substances, which subsequently *become* tannin, are injurious in that previous condition in which they occur in the young and early spring foliage of these trees and shrubs.

GYMNOSPERMS.

PINE FAMILY (*Coniferæ*). Only three plants (trees and shrubs) represent this group in England, Scotland, and Ireland—the Scotch Fir, the common Juniper, and the Yew. Numerous species of pines and firs are found in the cooler regions of the northern hemisphere ; their representatives in the southern being quite different, such as the familiar “Monkey-puzzle” tree (*Araucaria imbricata* from Chili).

Cryptogams (such as ferns, together with club-mosses and other flowerless plants) constituted a large proportion of the forests of bygone ages,

which went to form our coal. As far as negative evidence goes, no other flowering plants than Gymnosperms existed in the so-called Carboniferous age of the world.

This group of plants is called Gymnosperms, because the seeds are naked, having no enveloping pistil or carpel at all. In the case of the Fir-tree, a pair of ovules are attached to the base of a flat scale; in the Juniper, one ovule stands at the base of a scale, and three together make by the partial cohesion of the scales the so-called Juniper-berry. In the Yew, which is dioecious, the male flowers consist of a tuft of stamens, each having several anthers radiating from the top of the filaments (see left hand, Fig. 41). The female flower consists of nothing but a single ovule, surrounded by bracts resembling those around the stamens.

When the ovule becomes a stony seed, there is developed a scarlet cup around it (represented on the bough in the figure).

YEW (*Taxus baccata*, Fig. 41) is classed among the most dangerous of trees for cattle. It occasions more accidents than others, because it has no repelling scent nor flavour, as animals readily browse upon its foliage, especially in winter when they get too much dry food; and it is the older foliage which is the most harmful.

The poisonous character of the Yew was known to the ancients. Cæsar, for example, mentions

the fact that Cativolcus poisoned himself with it. They thought that whoever slept under a Yew-tree would die. But, of course, this was all imaginary.



Fig. 41. *Taxus baccata* ; Yew.

The Gauls, we are told, poisoned their arrows with the juice ; but this would be impossible from the small amount which could be put upon them.

The wood, bark, leaves, and seeds are all poison-

ous ; but the scarlet succulent envelope of the seed when ripe is innocuous. It is the leaves which are most dangerous, and, contrary to the rule, it is the older dark green, and not the bright green spring foliage which is the most poisonous.

Drying does not destroy the property, as a mishap occurred in administering powdered Yew-leaves to a child ; as well as fresh leaves as a vermifuge which produced fatal results.

Herbivorous animals alone are liable to be injured by the Yew. Horses, asses, cows and rabbits have been known to be poisoned ; not only from browsing upon the trees, but from the cut shoots where Yew hedges have been trimmed. These should always be carefully removed and burnt at once.

A case has been recorded of three horses taken to be sold at a country fair, that were tethered to the churchyard railings over which some Yew-boughs hung. The horses ate the leaves, and all three died.

Children have been not infrequently poisoned by eating *the green seeds together with* the harmless scarlet covering. The seeds are deadly poisonous.

It has even been given as a remedy for a complaint to some children ; but they all died within a few hours of each other.

Of thirty-two cases of poisoning by Yew, nine were by the berries and the rest from the leaves.

These were all accidental; twenty of the thirty-two died, or 62·5 per cent. It is remarkable that several deaths have occurred in lunatic asylums from the patients having chewed Yew-leaves.¹

SAVIN (*Juniperus sabina*).—Though our common Juniper (*J. communis*) is harmless, the berries being employed in flavouring gin, and when dried are a good stomachic, yet the Savin is not infrequently grown in gardens, introduced from the mountainous regions of Central and Southern Europe. Many cases of death have resulted from taking powdered Savin.

The leaves are poisonous, but their strong odour, resinous and acrid taste, repel all animals from browsing upon it.²

¹ Emetics, castor-oil, and stimulants are the means to be resorted to in cases of poisoning by *Yew*; with cold affusions, especially if there be much stupor (Tanner).

² In case of poisoning by *Savin*, Epsom salts and demulcents are recommended by Dr. Brunton: and as it is one of the "irritant" poisons, Dr. Tanner prescribes a treatment described under *Euphorbiaceæ*, in case of poisoning by members of that family. Note, p. 154.

CLASS II
MONOCOTYLEDONS

DIVISION I

PERIANTH SUPERIOR AND OVARY INFERIOR

DAFFODIL FAMILY (*Amaryllidaceæ*).— This family, like many other monocotyledonous plants, is characterized by having a six-leaved perianth instead of a calyx and corolla, these two whorls being represented by the parts being nearly or quite alike ; or at least both being petaloid. There are six stamens and a pistil of three coherent carpels.

It only differs from the Lily family by having an inferior ovary ; so that members of these two families are at once distinguished by that feature.

This family is represented in Great Britain by three genera only, as follows:—

DAFFODIL (*Narcissus Pseudo-narcissus*).—The bulbs of the Daffodil, as well as every other part of the plant, are powerfully emetic ; the flowers

also have been known to produce dangerous effects upon children who have swallowed portions of them. Nurses should be cautioned against putting flowers into the hands of infants.

POETS' NARCISSUS (*N. poeticus*).—This species is not wild, but abundantly cultivated both single and double, the latter resembling the flower of Gardenia. Its bulb is said to be more dangerous than that of the Daffodil, being powerfully emetic and irritant. Even the scent is deleterious, if the flowers be in any quantity in a closed room ; as they have produced intense headache and vomiting in some persons.

SNOWDROP (*Galanthus nivalis*).

SNOWFLAKE (*Leucojum æstivum* and *vernum*).—These two genera and species are both wild and cultivated.

Numerous other genera are grown in this country, such as the Guernsey Lily (*Nerine Sarniensis*), a native of South Africa, and many others. As the bulbs of several are known to be poisonous, those of the above British plants must be regarded with suspicion ; though no case is known of any one having been poisoned by them.

BLACK BRYONY FAMILY (*Dioscoreaceæ*).

BLACK BRYONY (*Tamus communis*) is our only representative. It is a familiar climbing plant scrambling over hedges, having oval, pointed and very glossy leaves ; small green flowers of which the

sexes are distinct on different plants; and bearing large quantities of scarlet berries in the autumn.

The root abounds in starch, like that of the true Bryony, to which this plant has, of course, no affinity, being a monocotyledon. It is purgative, and has been used in popular medicines, when reduced to pulp, for application to bruises. Hence it acquired the name in France of "Herbe aux femmes battues!"

The stems and leaves appear to have little or no deleterious properties; inasmuch as the Italians and Arabs are said to eat the young shoots like asparagus; and it is said that goats and sheep browse upon it with impunity.

The fruit, however, is decidedly poisonous; the juicy berries being without any disagreeable flavour, often attract children. Indeed, near Lyons, a woman gave her child the berries to eat, which proved fatal. The poison proved to belong to the acrid-narcotic class.

The large fleshy root is dark-coloured externally, otherwise resembling that of the Bryony. It is



Fig. 42. *Tamus communis*; Black Bryony.

very acrid, and was formerly used as a cathartic medicine, and still is so by quack doctors ; but it is a most dangerous remedy. Death is sure to result from an over-dose. The berries are very emetic.

In smaller doses than are sufficient to cause death, the berries of the Black Bryony cause paralysis of the lower extremities.

FLAG FAMILY (*Iridaceæ*).—The Iris Family is represented in Great Britain by the Iris, Crocus, and Gladiolus ; but a very large number of foreign species are in cultivation.

YELLOW or CORN FLAG (*Iris Pseud-acorus*).—This is common in our rivers, lakes, etc., and well known by its yellow flowers.

The structure of the flower of the Iris is as follows. First, there is an obvious inferior ovary. If cut through, it will reveal the usual three chambers characteristic of monocotyledons, with two rows of ovules in each cell. On the summit is the superior perianth, consisting of three outer leaves which hang downwards and three inner and smaller which are erect. In the centre is the style which branches into three petal-like extremities. There are three stamens (instead of the usual number of six in monocotyledons), one over each outer leaf and under a style-arm. The anthers burst *outwards* and not inwards, which is the rule. The stigma is a little ledge on the outer side of the style-arm,

just over the tip of the anther; so that the pollen cannot reach it unless an insect alighting on the leaf of the perianth called "the fall," searching down the holes at the base of the filament for honey, strikes its thorax against the anthers, thus removing a quantity of pollen. The stigmatic ledge can then receive it, on the insect flying to the other "falls" or to another flower.

It has long been known, even to Linnæus, that the Iris was dangerous to cattle. The flowers and the rhizomes have drastic properties and also very marked emetic ones.

All the other species of Iris must be regarded as equally suspicious.

CUCKOO-PINT FAMILY
(*Aroideæ*, Fig. 43.)—

Lords and Ladies, or Cuckoo-pint (*Arum maculatum*), is our only representative of this family, which contains many foreign poisonous plants. It is well known by its leaf, being shaped like an arrow-head and often spotted, and the large sheathed spathe with the purple spadix, which bears the male and female flowers upon it.



Fig. 43. *Arum maculatum*; Lords and Ladies.

The structure of the spadix with its flowers will be understood from the accompanying figures. Beginning at the base will be seen a number of pistils, each consisting of a round ovary, with only a truncated stigma upon it; a figure of this is seen in the middle of the woodcut. Above the pistils, each of which is regarded by botanists as a separate flower, is a ring of stamens, each consisting of a purplish anther with four cells (see figure on the extreme right). Above the anthers is a sort of fringe, corresponding to the place where the spathe contracts. The stem of the spadix is then prolonged into the purple club-like extremity, acting as a store-house of nutriment for the seeds to absorb in ripening. When this takes place, the spathe withers and falls off; the top of the spadix having surrendered its nourishment goes too, while only the basal part with the, now, scarlet berries remains (see figure at the top, left). A berry is hollow and has two or three wrinkled seeds at the bottom (see the one cut vertically to show the seeds within it).

All parts of the plant, tuber (see figure), leaves, and fruit, are poisonous. They contain a juice which loses its deleterious properties when dried.

Children have been frequently attracted by the brightly coloured berries, notwithstanding their unpleasant smell.

As the leaves when bruised give out a disagree-

able odour, they are not spontaneously eaten by animals; and they have never been known to cause death, as they quickly refuse them. Pigs which had eaten the tubers suffered, but none died; though it acts as an irritant and purgative.

In the case of little children who have died from eating the fruit, cramps and convulsions preceded death, with great internal pains and a sensation of burning. Indeed death has followed from the tenth to the twentieth hour after eating the poisonous fruit, when medical interference has been too late. The rhizome or tuber was formerly used by medical practitioners as a purgative, but it is now abandoned.

Besides their actual poisonous properties, the cells of the succulent fruit abound with needle-like crystals of calcium oxalate, sufficient to irritate the tongue when a broken berry is placed upon it. In a case of three children who had eaten some of the berries, their tongues became so swollen as to render swallowing difficult, when convulsions followed, and two died, but one recovered.

Arum italicum, found in the Isle of Wight, is a Mediterranean variety, and has the same poisonous properties.

Though the root is very acrid, yet its poisonous properties are destroyed by heat, and it then forms a nutritious food. In Dorsetshire, in the Isle of Portland, the plant being particularly abundant,

the peasants used to collect the tubers, and having ground them into a pulp, they were then baked, reduced to powder, and eaten as "Portland Sago."

The plant was also called Starch-wort, as it was used for stiffening the ruffs and frills worn by gentlemen and ladies in the reign of Queen Elizabeth. Gerarde in his *Herball* says—"The most pure and white starch is made of the rootes of the Cuckow-pint ; but most hurtfull for the hands of the laundresse that hath the handling of it ; for it choppeth, blistereth, and maketh the hands rough and rugged, and withall smarting."

Gilbert White records his observation that thrushes will scratch up the tubers and eat them in severe winters ; and that the berries are devoured by pheasants.¹

¹ The treatment recommended by Dr. Tanner for cases of poisoning by *Lords and Ladies*, or *Cuckoo-pint* (*Arum maculatum*), is to give emetics, unless spontaneous vomiting has freely taken place, when it may merely be encouraged by the use of diluents. If the irritant has passed into the intestines, it must be carried off by purgatives, especially by castor-oil. Emollient enemata, and fomentations to the abdomen will subsequently be found useful.

DIVISION II

PERIANTH INFERIOR AND OVARY SUPERIOR

LILY FAMILY (*Liliaceæ*).—There is great uniformity in the structure of the flowers of this family. The chief differences are as follows:— Since the parts of the outer whorl (calyx) are coloured, as are those of the inner (corolla), botanists call the whole a *perianth*, as stated, and its individual parts *leaves*. There are usually three parts in each whorl, and these may be all free as in a tulip, or all coherent as in the garden hyacinth. Then the stamens may rise freely from the receptacle as in a tulip; or they may be adherent to the free parts of the perianth as in the wild bluebell; or again, if the perianth have its parts coherent as in the hyacinth, then the stamens are usually adherent to it as in the hyacinth or Lily of the Valley.

The pistil is composed of three carpels, coherent from base to summit as of a tulip, and may become a capsule as in the flower of colchicum, or

it may be a succulent berry as in the Lily of the Valley and Paris.

Similar variations occur in members of the great Daffodil family (*Amaryllidaceæ*), and the reader may be reminded that the sole difference between these two families lies in the fact that the ovary and fruit are always "superior" in *Liliaceæ*, but "inferior" in *Amaryllidaceæ*.

Some plants of this family have poisonous bulbs, which have rarely caused mishaps, except perhaps by having been eaten for onions. It is as well to mention them.

SNAKE'S-HEAD FRITILLARY (*Fritillaria Meleagris*) is a native, but sometimes cultivated, known by its "squares" of different tints upon the perianth-leaves. It is sometimes white.

CROWN IMPERIAL (*F. imperialis*), supposed to be of Turkish or Persian origin, has long been cultivated. It bears a circle of pendulous flowers with a crown of foliage above them.

The bulbs have a foetid odour, described as being that of a fox, and are powerfully acrid and poisonous. Even honey from the flowers is said to be emetic.

TULIP (*Tulipa*, species).—We have one native species, the yellow-flowered *T. sylvestris*.

There has recently been found in the Tulip a principle which has been called *Tulipine*, and if it be introduced into the system in any quantity it

would not be exempt from harmful results ; though the bulbs of *T. sylvestris* are said to be eaten by the inhabitants of Siberia.

LILY OF THE VALLEY (*Convallaria majalis*).—This occurs abundantly, wild, in certain woods in England. It has a long creeping stem and no bulb.

It is a harmful plant in all its parts. The flowers are the most dangerous part, and should, therefore, never be put into the mouth.

The scent of the Lily of the Valley, as of Hyacinths, is too strong to allow these flowers to remain in a bedroom.

This plant does not often produce its berries, which are red, and would be therefore attractive to children. But it is advisable to warn them if they do appear, as well as against putting the flowers in their mouths.

PARIS (*Paris quadrifolia*, Fig. 44).—This is a not infrequent plant in certain woods. It is a small herb, with usually, but sometimes more than, four leaves in a whorl. It has green flowers, the whorls being in fours, and subsequently a black berry (see Fig. 44).

It is poisonous in all its parts, and the berries must be carefully avoided. The whole plant is emetic, and acts also as a sedative. It is rarely that children have been poisoned, but when they have taken them, the symptoms are described as those

of an acrid, narcotic property, resembling that of the Deadly Nightshade.

BLUEBELL (Hare-bell of Scotland), or WILD HYACINTH (*Scilla nutans*).—Common throughout the kingdom, it needs no description. The bulbs



Fig. 44. *Paris quadrifolia* ; Paris.

are very acrid, the deleterious principle residing in a viscous juice which pervades the whole plant. Other species of *Scilla* are much cultivated, and probably contain a like property. The Squill of druggists is a Mediterranean species, of which the

dried scales of the bulbs constitute the medicinal drug. A bulb of this was found attempting to grow after having been stowed away for more than twenty years in the Museum of St. Bartholomew's Hospital Medical School.

COLCHICUM FAMILY (*Melanthaceæ*).¹ — Two genera only represent this family in Great Britain; the Meadow-Saffron and the Scottish Asphodel.

COLCHICUM (*Colchicum autumnale*, Fig. 45).— This is a local plant, but occurs in meadows in many parts of England. It is well known by its rose-coloured flowers resembling those of the Crocus, hence it has been called the Meadow-Saffron or Autumn Crocus, but it has no relationship with that plant. There are some twenty European and Mediterranean species, but the above is the only indigenous one; several foreign species are cultivated in gardens.



Fig. 45. *Colchicum autumnale*; *Colchicum*.

The *Colchicum* flowers in autumn, but its leaves

¹ Placed by some authors as a *Tribe* of the Lily Family (*Liliaceæ*).

do not appear till the following spring, accompanied by the large capsule. It has only been separated from Lilies in consequence of the way its capsule bursts. By reference to the figure it will be seen that the three carpels separate from each other entirely, so liberating their dark brown seeds. In tulips and lilies each carpel breaks down the back (corresponding to the outer lines in the figure).

The *Colchicum* is acrid, and avoided by animals, probably from the nauseous odour.

All parts of the plant are poisonous. Drying does not remove the deleterious property. Water in which the leaves, flowers, etc., are macerated, becomes very poisonous; but the vegetative organs are less poisonous after the maturation of the seeds; though they are always dangerous, in consequence of the migration of the deleterious principle into the seeds on their ripening. This, called *Colchicine*, is not volatile. It is in August and September when the corms are richest in *Colchicine*.

Both men and children have been accidentally poisoned; but animals have been poisoned during May and from the middle of September to the end of October. In the first period, it is the leaves and unripe capsules which they eat, and in the second period it is the flowers, when they are consumed with the grass.

In case children should chew the petals or pick

out the young seeds and eat them, as they so often do with the Laburnum and other dangerous plants, it is advisable to caution them against such a practice.

Thus it is recorded that in the village of Schorren, in the Canton of Berne, a number of children died from eating the seeds, and fowls died from the same cause. The Colchicum is very abundant in some of the meadows in Switzerland.

Boys have been fatally poisoned after eating the bulbs in the field where they found them.

The Turks are said to infuse the flowers in wine to add to its inebriating effects.

Unfortunate results have followed from misuse of Colchicum wine for gout and rheumatism, in which the principle Colchicine was too strong; but only two cases are recorded of deaths in ten years. Mr. Blyth observes that he has seen cattle die from the effects of eating the Meadow-Saffron, and that farmers have had, in certain parts of the country, extensive losses from want of care and knowledge with regard to Colchicum poisoning.

Mr. Blyth records also a case of a man, aged fifty, who died after taking twenty-eight Blair's gout-pills. They consisted of finely-ground Colchicum corms, but were so hard that the poison accumulated, as they remained undigested.

An instance is recorded of a poor woman who picked up some bulbs of the Colchicum thrown

away by a tradesman in Covent Garden market, and taking them to be onions, ate them, and died immediately. In another case a man swallowed some seeds, which proved equally fatal.

It is a member of the British Pharmacopœia, and has caused several accidents through careless use ; for less than half a grain of the active principle, *Colchicine*, has proved fatal to adults.¹

HELLEBORE,² WHITE and BLACK (*Veratrum album* and *V. nigrum*). These two species are sometimes grown in gardens, being natives of Central and Southern Europe. They bear tall spikes of greenish-white or purplish flowers, and oval-ribbed leaves, like those of the common Plantain.

All parts of the plants are poisonous. Drying does not remove the deleterious properties ; which are indeed said to contaminate other plants when made into hay together with them.

¹ Dr. Tanner gives emetics, purgatives, and stimulants as the means employed to prevent death in poisoning by *Colchicum*. Dr. Brunton adds Tannic or Gallic acid.

For poisoning by *Colchicum*, *Meadow-Saffron*, *Colchicum* wine, tincture, pills, etc.—Mr. Blyth suggests emptying the stomach by pump or emetics, such as sulphate of zinc, mustard, ipecacuanha : give strong tea or coffee ; keep the extremities warm, apply hot fomentations to the abdomen ; stimulants may be used ; and give plenty of water and demulcent drinks.

² This name properly belongs to the genus *Helleborus*, described under *Ranunculaceæ*.

The only case known of poisoning was of pigs which had eaten the root ; but not fatally. The taste is acrid and burning to the mouth, so that they are quickly rejected by animals.

No case of human beings having been poisoned is known, as these Hellebores afford no attraction.¹

¹ Dr. Brunton gives as remedies to poisoning by *Veratrum*, stimulants, warm coffee, and a recumbent posture. Dr. Tanner says :—Emetics, purgatives and stimulants are the means employed to prevent death in poisoning by these plants. As an antidote to poisoning by *White Hellebore* or *Veratrine*, Mr. Blyth empties the stomach by pump or by an emetic, mustard, zinc sulphate or ipecacuanha. Keep the patient lying down. Stimulants may be administered. An enema of hot coffee has been recommended. Keep the body warm with wraps, hot blankets, etc.

DIVISION III

FLOWERS WITH GLUMES INSTEAD OF A PERIANTH

THE GRASS FAMILY (*Gramineæ*).

DARNEL (*Lolium temulentum*, Fig. 46).—This and a variety found in flax fields (*L. linicola*) are credited with being the only grasses known or

believed to be poisonous.

It resembles the common rye-grass (not rye), which

is another species of the same genus (*L. perenne*)

in having its "spikelets" standing edgewise against

the flowering stem (see figure), and protected by

a single and much-elongated outer "glume."

Wheat, it may be remembered, has its spikelets

situated sideways against the stem and



Fig. 46. *Lolium temulentum*;
Darnel.

protected by two outer glumes.

Each spikelet consists of about five distinct flowers. They have no perianth, but only a glume, the rib of which runs out and becomes an awn if present, as represented in the figure. Within this boat-shaped glume is another facing it with two ribs, called the "pale." These two include three stamens (left-hand figure) and a pistil of two coherent carpels with feathery stigmas. In addition are two minute scales apparently of no function; perhaps the rudiments of a lost perianth.

Darnel is a cornfield weed and an annual, and was believed by the ancients to be injurious, for Virgil speaks of the *infelix lolium*.

The stem and foliage are not at all poisonous, and often used as fodder, if at all abundant, as in Malta. It is only the grain which is poisonous, both to man and animals; but by no means always, for bread has been made out of it and eaten with impunity. On the other hand, when the grain has been ground up with wheat, notwithstanding that the latter had no odour or taste of any peculiar kind, the bread *has* poisoned those who ate it. In the South of France it is said that Darnel is sometimes actually given to restless mules, as it tends to produce a comatose state; but many disorganizations of the digestion have occurred in cattle when grain-siftings were given to them which contained, besides Darnel, seeds of Corn-cockle and other injurious plants.

Dr. Taylor could record no fatal case up to 1859. The effects of eating bread containing flour of Darnel grains are described as resembling those of intoxication. Dr. Taylor says that the persons who partook of the bread staggered about ; there was giddiness, with violent tremblings of the arms and legs, similar to those observed in *delirium tremens*, but of much greater intensity ; greatly impaired vision followed, every object appearing of a green colour to the sufferer ; and accompanied by great prostration of strength.¹

Besides bread, beer made with barley intermixed with seeds of Darnel has proved injurious. In this case the Darnel was put in purposely to enhance its intoxicating powers. It was a common practice in the Middle Ages.

Comparing a grain of Darnel with one of wheat, the former is longer and somewhat truncated, with a deep groove, and enveloped in the inner glume or "pale" ; whereas wheat is always naked. The starch grains are very minute, while those of wheat are large and round. They more resemble those of maize or rice.

The poisonous property appears to belong to

¹ Dr. Taylor recommends a free use of stimulants in the case of poisoning by *Darnel* ; and castor-oil.

Dr. Tanner says :—Emetics, castor-oil, and stimulants. Cold affusions will often be useful, more especially if there be much stupor.

two substances, a yellow matter and an extractive ; but little is as yet known about their compositions.

Though poisonings have been frequent, deaths have been rare. It is recorded that an individual succumbed after eating bread which was made of wheat in the proportion of one-third, with two-thirds of Darnel.

Thirty grammes of the meal of Darnel appears to be the limit which a man can take without dangerous symptoms following.

The effects upon man are the production of vertigo, and great somnolence, coupled with other ailments.

It is said that it is particularly in wet seasons that the dangerous properties are most conspicuous. As it is under moist conditions that the fungus known as Ergot attacks all kinds of grasses, it has been suggested that the poisonous properties of Darnel may be really due to an incipient stage of that parasite, or to some other which does not assume the Ergot-form. The same author describes the effects of Darnel as "vertigo, dimness of vision, headache, a sort of drowsiness and stupor." The result of eating rye-bread in which Ergot was ground up was "nausea, vomiting, pain and vertigo in the head, giddiness, dilatation of the pupils, delirium and stupor."

Not only do these effects of Darnel and Ergot resemble one another, but Gerarde in describing

the use of Darnel in his day (1597), says :—"The new bread wherein Darnell is, eaten hot, causeth drunkenness ; in like manner doth beere or ale wherein the seede is fallen, or put into the mault." It was also used for the same purpose that Ergot is employed medicinally at the present day.

Dr. Taylor observes that rye-bread is not much used in this country, but the accidental presence of the *Ergot* (which particularly affects rye, supplying the *Secale cornutum* of druggists) may sometimes account for the symptoms of poisoning which have been observed.

CRYPTOGAMS.

TOADSTOOLS, ETC. (*Fungi*).—These are familiar to every one, and the one general recommendation is to *forbid children to touch any toadstool they may find growing in the garden, or wild*, as many are deadly poisonous ; and it is impossible for any one, except an expert to know which are harmless and which are not, beyond a very few species.¹

¹ Antidotes to poisoning by *fungi*, generally, are given by Mr. Blyth as follows :—Empty stomach by stomach-pump or tube ; or administer by the mouth either mustard or zinc sulphate. Give a dose of castor-oil, and use an emetic to remove the remains of the fungi from the intestines. Stimulants may be given, and the body kept warm.

LIBRARY
COLLEGE OF AGRICULTURE
UNIVERSITY OF WISCONSIN
 MADISON

INDEX

- Acacia, False, 77
 "Achene," 19
 Aconite (Monkshood or Wolfsbane), 43
 — Classical refs. to, 44
 — Poisoning of wells by, 45
 — Whole families poisoned by, 46
Actea spicata (Baneberry), 49
Aethusa Cynapium (Fool's Parsley), 86
Agrostemma Githago (Corncockle), 58
 Alleluya (Wood-sorrel), 64
 Almond, 18
 — Bitter, injurious use of, 80
 — — Oil of, dangerous, 79, 80
 — Flavouring, dangerous use of, 79
 AMARYLLIDACEÆ, 161
Amygdalus communis (Almond), 78
Anagallis arvensis (Pimpernel), 113
Anemone, sp., 33 ff.
 — Arrows poisoned with, 34
 — Wood, injuring cattle, 34
Anthriscus sylvestris (Sheep's Parsley), 98
Apium graveolens (Celery), 93
 APOCYNACEÆ, 133
Apocynum (Dog's-bane), 134
 Apricot Kernels, dangerous, 82
Aquilegia vulgaris (Columbine), 47
 ARALIACEÆ, 100
Aristolochia, 144
 ARISTOLOCHIACEÆ, 144
 Aristolochine, 145
 AROIDEÆ, 165
Artemisia, sp., 104
Arum maculatum (Lords and Ladies), 165 ff.
 Asarabacca, 145
Asarum europæum, 145
Atropa Belladonna (Deadly Nightshade), 119
 Atropine, 122
 Aubergine, 118
 Baneberry, 49
Batatas edulis (Sweet Potato), 115
 Beech, 155
 — Husks, injurious to cattle, 155
 Belladonna (Deadly Nightshade), 120
 — Berries, very poisonous, 120
 — Classical refs. to, 121
 Bindweed, Black, 141
 Birthwort, 144
 Bittersweet, 115
 — Berries, injurious to children, 116
 Black Bindweed, 141

- Black Bryony, 162
 ——— Eaten as Asparagus, 163
 ——— Fruit, poisonous, 163
 ——— Used for bruises, 163
 Black Solanum, berries harmful,
 117
 Blue-bell, 172
 Box, 153
 ——— Leaves used for hops, 153
 ——— injurious to animals,
 153
 Broom, Common, 71
 Broomrape, 140
 Broom, Spanish, 75
Bryonia dioica (Bryony), 83
 Bryony, Berries fatal to children,
 84
 ——— Root contains starch, 85
 Buttercup Family, 30
 Buttercups, 35 ff.
 ——— Irritant juice of, 36 ff.
 Buckthorn, 69 ff.
 ——— Berries, effects of, 70
 ——— Dye from, 70
 Buckwheat, effects on sheep, 143
Buxus (Box), 153

 Cabaret (Asarabacca), 146
Caltha palustris (Marsh Marigold),
 40
Campanula, sp., 107
 Canterbury Bell, 107
 CAPRIFOLIACEÆ, 102
 Carrot, Wild, 99
 CARYOPHYLLACEÆ, 58
 Cascara Sagrada, 70
 Castor-oil, 154
 ——— Seeds, fatal to children,
 etc., 154
 Celandine, 56
 ——— A drastic purgative, 57
 Celery, 93
 ——— Used green in Malta, 93
 Ceres and poppies, 52
Chelidonium majus (Celandine), 56

 Cherry Laurel, 81
 ——— Leaves dangerous, 82
 Christmas Rose, 42
Cicuta virosa (Water-Hemlock or
 Cowbane), 93
 "Circumscissile" dehiscence, 126
 "Cleistogamous," 63
 Clematis, effects of juice, 33
Clematis Vitalba (Travellers' Joy),
 31
 Coal-plants, 157
 "Cohesion," 23
 Colchicine, 174
Colchicum autumnale (Meadow
 Saffron or Autumn Crocus), 173
 ——— Bulbs poisonous, 135
 ——— Gout-pills, 175
 Columbine, 47
 ——— Tincture of seeds dangerous,
 48
 COMPOSITÆ (Composites), 104
 CONIFERÆ, 156
Conium maculatum (Hemlock), 90
Convallaria majalis (Lily of the
 Valley), 171
 CONVULVULACEÆ, 114
Convolvulus arvensis (Lesser
 Bindweed), 141
 Cordials, etc., dangers of, 53
 Corn-cockle, 58
Coronilla, sp., 74
 Counterblaste, King James', 129
 Cowbane, 93
 Cow-wheat, 139
 ——— Bread contaminated
 with seed of, 139
 Crocus, Autumn (Colchicum), 173
 Croton-oil, 154 (*note*)
 Crowfoot, Water, harmless, 35
 Crown Imperial, 70
 CRYPTOGAMS, 156, 182
 Cuckoo-pint, 165
 CUCURBITACEÆ, 83
 CUPULIFERÆ, 155
Cuscuta (Dodder), 115

- Cyclamen*, poisons fish, 114
 — Purgative, 114
 — sp., 113
 Cytisine, 72, 120
Cytisus, sp., 71
 Daffodil, 161
 — Bulb, emetic, 161
 Dane-wort, 103
Daphne, sp., 146
 Darnel, 178
 — or Ergot (?), 181
 — Intoxicant, 180
Datura Stramonium (Thorn-apple), 123
 Daturine, 122
Daucus Carota (Carrot), 99
 "Declinate" stamens, 109
Delphinium, sp., 48
 Devil-in-a-bush, 49
 DICOTYLEDONS, 27
Digitalis purpurea (Foxglove), 137
 "Dimorphism," 112
 DIOSCOREACEÆ, 162
 Dock, 142
 Dodder, 115
 Dog's-bane, 134
 Dropwort, Water, kinds of, 194 ff.
 "Drupe," 111
 Dutchman's Pipe, 145
 Egg Plant, 118
 Elder, Common, 102
 Ergot, 181
 ERICACEÆ, 109
 Essence of Salt of Lemons, 64
Euonymus europæus (Spindle-tree or Prick-wood), 66
Euphorbia, sp., 148 ff.
 EUPHORBIACEÆ, 147
 Euphorbium, Gum, 154 (note)
Fagopyrum esculentum (Buck-wheat), 143
Fagus sylvatica (Beech), 155
 Field Poppy, 54
 Figwort, 136
 Fitches, 50
 Flag, yellow, or corn, 164
 "Floral receptacle," 21
 "Florets," 104
 Flower, Parts of, 16 ff.
 — — — Uses of, 19 ff.
 Fly-trap (Dog's-bane), 134
 "Follicles," 40
 Fool's Parsley, 86
 — — — Fatal to children, 89
 Foxglove, all parts poisonous, 137
Fritillaria, sp., 178
 Fruits, Nature of parts of, 19
Fungi (Toadstools), 182

Galanthus nivalis (Snowdrop), 162
 Gall, of Scripture, 51 (note)
 "Genus," 28
Glaucium luteum (Horned-Poppy), 55
 "Glumes" of Grasses, 178
 GRAMINEÆ, 178
 Guernsey Lily, 162
 "Guides" in Flowers, 109
 GYMNOSPERMS, 27, 156
Gypsophila Struthium, 61

 "Hashish," 144
 Heath Family, Edible fruits of, 109
 Hebenon, 130
Hedera Helix (Ivy), 100
 Hellebore, Danger of infusion, 42
 — Injury to cows, 42
 — sp., 41
 — White and Black, 176
 Hemlock, Classical refs. to, 90, 91
 — Effects on animals, 92
 — Extract of, dangerous, 91
 — Influence of climate on, 92
 Henbane, 124
 — Root, eaten for chicory, 126
 — Seeds, used for fattening cattle, 126

- Henbane Seeds, for tooth-ache, 127
Heracleum Sphondylium (Hogweed), 99
 Hogweed, 99
 Horned-Poppy, 55
 Hyacinth, Scent of, injurious, 171
Hyoscyamus niger (Henbane), 124
- Indian Peas, 77
 — Tobacco, injudicious use of, 108
 "Inferior," 22, 27
Ionidium, 58
 Ipecacuanha, 58
 IRIDACEÆ, 164
Iris, sp. (Flag), 164
 — Dangerous to cattle, 165
 Ivy Berries, dangerous to children, 100, 101
- Jalap, 115
 Jews' Apple, 118
Juniperus, sp. (Juniper), 160
- Kalmia latifolia*, 110
 — Highly narcotic, 110
 — Poisons the flesh of hares, 110
- Labrador Tea, 111
 Laburnum, 72
 — Children often poisoned by, 72
 Lactucarium, 106
Lactuca, sp., 105
 Lactucine, 106
 Larkspur, 48
 "Latex," 152
Lathyrus, sp., 76
 Laudanum, 53
 Laurel-water, dangerous, 81
Ledum, sp., 111
 "Legumen," 40
 LEGUMINOSÆ, 70
- Lesser Celandine, 39
 Lesser Stitchwort, 61
 Lettuce, Wild, 105
Leucocjum (Snowflake), 162
 "Ligulate" corolla, 104
Ligustrum vulgare (Privet), 111
 Lily, 169
 — of the Valley, very harmful, 171
Linaria, sp. (Toadflax), 138
Lobelia, sp., 107 ff.
 Locust-tree, 77
Lolium temulentum (Darnel), 178
 LORANTHACEÆ, 147
 Lords and Ladies, 165
 — Scarlet berries, injurious, 167
 — Used in 16th century, 168
 Lousewort, 138
 Love-in-a-mist, 49
 Lupin, 75
 Lupinose, 75
Lupinus, sp., 75 ff.
- Mad-apple, 118
 Maladie des bois, 155
 Manchineel, 148
Mandragora, 122
 — Ancient use of, 123
 Mandrake, 122
 Marsh Marigold, 40
 Maw-seed (Poppy-seed), 52
 Meadow Saffron (*Colchicum*), 173
Melampyrum, sp., 139
 Melon Family, 83
Mercurialis, sp. (Mercury), 151
 Mezereon, 146
 Mistletoe, berries harmful, 147
 Monkshood (*Aconite*), 43
 MONOCOTYLEDONS, 27, 161
 Morion, 123
 Morphine, 55
 Mugwort, 104
 Mullein, Great, 138

- Narcissus*, sp., 161
 ———— Bulbs emetic, 167
 "Natural Order" (or Family), 26
Nerine, sp., 162
Nerium Oleander, 133
 Nicot, Jean, 129
Nicotiana, sp., 127
 Nicotine, 128
Nigella damascena (Love-in-a-mist), 49
 Nightshade, Deadly, 119
 ———— Woody, 115

 Oak, 155
 ———— Young foliage injurious to cattle, 155
Oenanthe, sp. (Water Dropworts), 94 ff.
 Old Man's Beard, 31
 OLEACEÆ, 111
 Oleander, all parts poisonous, 133
 ———— Soldiers poisoned by, 134
 Opium, 50
 OROBANCHACEÆ, 140
Orobanche, sp. (Broomrape), 140
 Oxalate of Lime, 143
 Oxalic acid, 64
 OXALIDACEÆ, 63
Oxalis Acetosella (Wood-sorrel), 63

 "Pales" of Grasses, 179
 Panaisie, 99
 "Panicle," 136
Papaver, sp. (Poppy), 50 ff.
 PAPAVERACEÆ, 50
 PAPILIONACEÆ, 71
Paris quadrifolia (Herb Paris), 171
 Parsley, Beaked, 98
 Parsnip, Cow, 99
 ———— Water, 90
 Pasque-flower, 33
 "Path-finders" on Corollas, 109
 Peach-nut oil, 79
Pedicularis, sp. (Lousewort), 138

 "Perianth," 27
 Periwinkle Family, 133
Phaseolus vulgaris (Scarlet Runner), 74
 Pimpernel (injurious to birds), 113
 Pine Family, 156
 Pink Family, 58
 Poison, Definition of, 14
 POLYGONACEÆ, 141
Polygonum, sp., 141
 Poor Man's Weather-glass, 113
 Poppy, 50 ff.
 ———— Classical refs. to, 54
 ———— Field, 54
 ———— Heads, 53
 Portland Sago, 168
 Potash, Bincoxalate of, 64
 Potato, 117
 ———— Raw, harmful to cattle, 118
 Prick-wood, 67
 Primrose Family, 112
 PRIMULACEÆ, 112
 Privet, 111
 ———— Berries, injurious to children, 112
 PRUNACEÆ, 78
Prunus, sp., 78 ff.
 Prussic acid (Egyptian refs. to), 89
 ———— Plants yielding, 82

Quercus, sp. (Oak), 155

 RANUNCULACEÆ, 30
Ranunculus, sp. (Buttercup), 35
 Receptacular Expansion, 21
 ———— Tube, 22
 Regular and Irregular flowers, 24
 RHAMNACEÆ, 69
Rhamnus, sp. (Buckthorn), 69
Rheum, sp. (Rhubarb), 143
 Rhinanthine, 139
Rhododendron, sp., 109 ff.
 ———— Medical uses of, 110
 Rhubarb, 143

- Ricinus communis* (Castor-oil),
154
Robinia Pseud-acacia, 77
ROSACEÆ, 77
Rumex, sp. (Dock), 142
- Salt of Lemon, 142
— Sorrel, 64
"Samara," 111
Sambucus, sp. (Elder), 102
Santonin, 105
— Effects on sight, 105
Saponaria officinalis (Soapwort),
61
Saponine, 61
"Save" of Chaucer, 61
Savin, 160
Scarlet Runner, 74
Scilla, 172
Scorpion Senna-tree, 74
Scrophularia, sp. (Figwort), 136
Scrophularine, 134
Secale cornutum (Ergot), 182
Sheep's Sorrel, 142
Sium, sp. (Water Parsnip), 98
Snake's-head Fritillary, 170
Snowdrop, 162
Snowflake, 162
Soapwort, 61
SOLANACEÆ, 115
Solanum, sp., 115 ff.
— *Dulcamara* (Bittersweet or
Woody Nightshade), 116
Sorrel, injurious to children, 142
Southernwood, 104
Sowbread, 114
Sparteine, 72
Spartium junceum (Spanish
Broom), 75
Spear-wort, 38
"Species," 25
"Spikelets" of Grasses, 178
Spinach, Wild, 152
Spindle-tree, 66
Spiraea, sp., 83
- Spurge, 148 ff.
— Caper, 149
— Family, 147
— Fatal to boys, 151
— Laurel, berries dangerous,
146
— Milky juice, dangerous use
of, 148
Starch-wort, 168
Stellaria graminea, injurious to
horses, 61
"Superior," 27
Swallow-wort, 57
Sweet Potato, 115
Syrup of Poppies, dangerous, 53
- Tamus communis* (Black Bryony),
162
Taragon, 105
Taxus baccata (Yew), 157
Thorn-apple, 123
— Seeds poisonous, 124
THYMELACEÆ, 146
Toadflax, 138
Toadstool, *all* to be avoided, 182
Tobacco, 127
— Effects on athletes, 131
— Probably referred to by
Gerarde (1597), 130
— Great opposition to, in the
16th century, 129
— Indian, 108
— Introduction of, 129
— Juice, dangerous uses of,
128
— Mentioned by Shakespeare,
130
Traveller's Joy, 31
Tulip, 170
- UMBELLIFERÆ, 85
"Venation," 28
Veratrum, sp. (White and Black
Hellebore), 176

- Verbascum Thapsus* (Great Mullein), 135
 Vetchling, Yellow, 76
 VIOLACEÆ, 57
 Violet, 57
- Water Dropwort, roots eaten as parsnips, 94 ff.
 — Hemlock or Cowbane, 93
 — Pepper, 141
 "Whorls," Floral, 17 ff.
 Wild Hyacinth, 172
Wistaria sinensis, 74
 Wolfsbane (Aconite), 43
- Wood Anemone, 34
 — Sorrel, 63
 Woody Nightshade (Bittersweet), 115
 Woorari poison, 114
 Wormseed, 104
 Wormwood, 105
- Yellow Rattle, 139
 Yew, 157
 — Classical refs. to, 157
 — Old foliage especially dangerous to cattle, 157
 — Seeds, dangerous, 159

THE END

**RICHARD CLAY & SONS, LIMITED,
LONDON & BUNGAY.**

PUBLICATIONS

OF THE

Society for Promoting Christian Knowledge



Botany. By the late Professor R. BENTLEY. Illustrated.
Fcap. 8vo, cloth boards, 1s.

Chemistry of Creation, The. Being a Sketch of the chief
Chemical and Physical Phenomena of Earth, Air, and Ocean.
By the late ROBERT ELLIS, M.R.C.S. A new Edition, revised
by Professor BERNAYS, Ph.D., F.C.S. With numerous Illustrations.
Fcap. 8vo, cloth boards, 4s.

Diseases of Plants. By Professor MARSHALL WARD, M.A.,
F.R.S. Post 8vo, cloth boards, 2s. 6d.

Edible and Poisonous Mushrooms: What to eat and what
to avoid. By M. C. COOKE, M A., LL.D. With 18 coloured
Plates, illustrating forty-eight species. Crown 8vo, cloth boards,
3s. 6d.

Fern Portfolio, The. By FRANCIS G. HEATH. With 15
Plates, elaborately drawn, life-size, exquisitely coloured from
nature. Cloth boards, 8s.

Flowers of the Field. By the late Rev. C. A. JOHNS
(29th Edition). Entirely re-written and revised by Professor
BOULGER, F.L.S., F.G.S. With numerous Woodcuts. Small
post 8vo, cloth boards, 7s. 6d.

- Forest Trees of Britain.** By the late Rev. C. A. JOHNS.
With numerous Woodcuts. Post 8vo, cloth boards, 5s.
- Freaks and Marvels of Plant Life; or, Curiosities of
Vegetation.** By M. C. COOKE, M.A., LL.D. With numerous
Illustrations. Post 8vo, cloth boards, 6s.
- How to Observe.** Suggestions to Young Folk about
Country Life. By CATHERINE PULLEIN. 18mo, limp cloth, 6d.
- Making of Flowers, The.** By the Rev. Professor G.
HENSLOW, M.A., F.L.S., F.G.S. Post 8vo, cloth boards, 2s. 6d.
- Romance of Low Life Amongst Plants: Facts and Pheno-
mena of Cryptogamic Vegetation.** By M. C. COOKE, M.A.,
LL.D. Post 8vo, cloth boards, 4s.
- Selborne, The Natural History of.** By the late Rev.
GILBERT WHITE, M.A. Arranged for Young Persons. With
Map and numerous Woodcuts. Post 8vo, cloth boards, 2s. 6d.
- Wayside Sketches.** By F. EDWARD HULME, F.L.S., F.S.A.
With numerous Illustrations. Crown 8vo, cloth, 4s.
- Where to Find Ferns.** By FRANCIS G. HEATH. With
numerous Woodcuts. Fcap. 8vo, cloth boards, 1s. 6d.
- Wild Flowers.** By ANNE PRATT, Author of "Our Native
Songsters." Two vols. With 192 coloured Plates. 16mo, cloth
boards, 8s.

SOCIETY FOR PROMOTING CHRISTIAN KNOWLEDGE,
LONDON: NORTHUMBERLAND AVENUE, W.C.

89038562252



b89038562252a

may be kept

FOURTEEN DAYS

TWO CENTS will be charged
if the book is kept overtime.

MAR 14 1971

MAY 12 1971

JAN 31 1972

STORAGE

MM MR 29 '78



89038562252



b89038562252a