

# LANTERN SLIDES



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- A—MICROSCOPE SLIDES.
- B—MICROSCOPES AND ACCESSORIES.
- C—COLLECTION APPARATUS.
- D—MODELS, SPECIMENS AND DIAGRAMS—  
BOTANICAL, ZOOLOGICAL, GEOLOGICAL.
- E—LANTERN SLIDES  
(Chiefly Natural History).
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- S—CHEMICALS, SPECIMENS AND REAGENTS.
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# LANTERN SLIDES

*illustrating*

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# CATALOGUE "E"

1924.

**Cancelling all Previous Issues**



## **Note to Fourth Edition.**

In presenting this New Edition we wish to point out to our clients that our entire collection of Negatives has been re-arranged and we have removed from the Catalogue such slides as appeared to be redundant, and also those for which there is little demand. Several new Sections have been added, and, in many cases, old photographs have been replaced by better ones.

### **STOCK SLIDES.**

Although we hold large stocks of plain slides it frequently happens during the busy Season that particular slides desired have to be made after receipt of the order. Good notice should, therefore, be given.

**TONED SLIDES.**—Most stock slides may be had toned an artistic shade of brown at an extra cost of 6d. each, 4/6 per dozen. A few slides lend themselves to blue or green toning; they may be had so treated at an extra charge of 6d. each.

**COLOURED SLIDES.**—We take special care in the colouring of our slides. Our artists have had many years experience and the colours used have been selected by us for their permanence and transparency. Examples to show the beauty and general high character of our coloured work are always available for inspection. We are not able to keep large stocks as our artists are so fully occupied. Adequate time, therefore, should be allowed when coloured slides are ordered, so as not to rush the work.

All slides are made the Standard English Size,  
 $3\frac{1}{2} \times 3\frac{1}{2}$  inches, unless ordered otherwise.

## TERMS.

The prices quoted in this catalogue are nett. Special quotations will be given for very large orders.

Carriage or Postage and Insurance, are extra in all cases. In the case of first orders, references or a remittance should be included, making due allowance for postage, package, etc.; any surplus will be returned or retained as deposit, as desired. Schools, Colleges, or Customers with satisfactory introduction may open credit accounts, payable monthly or by arrangement.

**NAMES AND ADDRESSES** should be written distinctly.

**DELIVERY.**—The date on which the slides are required should always be stated. We can generally execute orders within a week, but in the case of coloured slides a longer time should be allowed.

**APPROVAL.**—We are always willing to send selections of slides on approval on condition that any not required are returned within seven days from date of invoice, that a reasonable number are kept, and that the customer pays the carriage and insurance in both directions.

**SLIDES NOT LISTED.**—We can supply slides by the leading English and Foreign makers. Lists of requirements should be sent and we will report. These slides cannot be hired.

### **INSURANCE—Parcel Post Packets—Great Britain only.**

For the convenience of customers we have arranged a system of insurance of slides, whereby, for a small fee, we take upon ourselves all risks of breakage *in transit*.

Parcels of less than 5/- in value are only insured by special request.

In case of breakage we must be informed *at once* and the broken slides, together with the packing *and outer wrapping*, must be kept for inspection if required.

*Unless breakages are reported within 2 days of receipt, claims cannot be entertained.*

**CUSTOMERS ABROAD** are requested to state the size of the slides required, otherwise the Standard English size,  $3\frac{1}{2} \times 3\frac{1}{4}$  inches will be sent.

The Standard Continental size is  $8\frac{1}{2} \times 10$  c.m. and the American  $3\frac{1}{2} \times 4$  inches.

Slides in either of these sizes entail an extra charge of *2d. each; 2/- per dozen*.

**BOOK ILLUSTRATIONS.**—Many of the photographs in this catalogue are available for use as Book Illustrations, &c., on reasonable terms.

**ENLARGEMENTS** from many of these photographs may be had either mounted or unmounted, and framed if desired. Quotations on receipt of particulars.

**Prices subject to alteration with or without notice.**

MANCHESTER.

NOVEMBER, 1924.

## SLIDES ON HIRE.

### TERMS AND CONDITIONS—2/6 per dozen, per lecture (minimum 1 dozen.)

With few exceptions, specially noted in the text, all slides listed may be had on hire.

Generally plain slides only are hired. If more convenient to us, however, some coloured ones may be added. Insurance, postage, or carriage in both directions to be paid by hirer.

**ORDERING.**—The date of lecture must be stated.

The code letter and number of Section and reference numbers of the slides required should be given in sequence.—It is not necessary to quote the title of each slide.

**NOTICE.**—In order to ensure the smooth working of this Department and to avoid disappointment, *not less than eight clear days notice must be given.*

**CANCELLATION.**—A fee of 1/- is charged if slides booked for a certain date are cancelled or postponed.

**DESPATCH.**—We endeavour to post slides two days before the lecture but cannot bind ourselves to do this. All slides are sent by Parcel Post unless otherwise arranged.

**RETURN.**—Slides must be returned early on the day following lecture—*packed exactly as received.* If retained longer an additional charge of 1/- per dozen slides per day will be incurred. It is essential that the name of the sender is placed inside the parcel, and that the special addressed insurance label be used. It is then unnecessary to register or insure the parcel with the Post Office

**PURCHASE.**—Any slides on hire may be purchased if desired. If half the slides are bought the entire hire charge is cancelled: otherwise only that on the slides purchased.

Hire charges cannot be booked but are payable in advance or when the slides are returned.

**INSURANCE.**—In order to avoid difficulties and delays we have arranged, for a small fee, an insurance system to cover breakage in transit.—Slides broken whilst in customers' hands are at their charge. If any slides arrive broken we must be informed *at once* and the damaged slides must be returned with the others after the lecture, securely packed, exactly as received; also the outer wrapper.

**SUBSCRIPTION RATES.**—Payable in advance:—

A fee of £2 2s. entitles the borrower to hire 250 slides during 12 months.

A fee of £3 3s. entitles the borrower to hire 500 slides during 12 months.

Not less than two dozen slides may be requisitioned for any one lecture.

Postage and Insurance fees are kept as a separate account and must be paid for in addition to this subscription. The above subscriptions lapse after 12 months *whether the total number of slides have been hired or not.* If, however, a fresh annual subscription be paid, any slides outstanding will be carried forward.

## LANTERN EXHIBITIONS.

We have competent Lantern Operators on our staff and can arrange for Exhibitions in and around Manchester.

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To avoid disappointment it is advisable to book dates well in advance.

## SLIDES MADE TO ORDER.

Our business in this department has always shown a steady growth. We have installed additional and improved apparatus, and are now able to deal with large quantities. The experience of many years enables us to secure the best results possible.

**DELIVERY.**—During the busy winter months a clear week at least should be allowed, and customers should give the latest possible delivery date. Nevertheless, we endeavour to oblige customers who cannot give so long a notice. Such expressions as “urgently required,” etc., are of little value.

**EMERGENCY ORDERS.**—If Slides are required to be despatched within 24 hours of receipt, this can generally be managed by arrangement, an extra fee of 4d. per slide upwards being charged according to circumstances. Rush orders of this kind should be avoided where possible.

All Slides are made the standard English size,  $3\frac{1}{4} \times 3\frac{1}{4}$  inches, unless we are expressly instructed otherwise on each order. All Slides are properly masked, spotted, and bound up with clear cover glass, and provided with a white label for naming.

### SCALE OF CHARGES.

	Each.	Not less than 1 doz. per doz.
(a) From customers' negatives (Films or Glass), by Contact .....	1/-	10/6
(b) From customers' negatives, up to $6\frac{1}{2} \times 4\frac{1}{2}$ by Reduction or Enlargement .....	1/2	12/6
Larger sizes, quoted for specially.		
(c) From Drawings, Prints, Diagrams, &c., up to 30in. in greatest length ....	1/8	18/6
(Larger sizes extra according to size.)		
(d) From Specimens, Models, Objects, Coins, &c., in accordance with the work entailed .....	2/-	—
(e) Coloured Lantern Slides from Prints, Maps, Drawings, or Specimens, from .....	3/6	—
(f) Photomicrographic Lantern Slides, low powers up to 250 diams .....	4/6	—
High Powers up to $\times 1,600$ or more, .....	7/6	—
(g) Colour-Photo Lantern Slides by the Paget or Autochrome Process from suitable subjects .....	8/6	—

### EXTRAS.

Toning slides to an artistic Warm Brown Colour .....	-/8	4/6
A few should be included in every Lecture, to break the monotony of the usual black and white kind.		
Toning, Green, Blue, or Red .....	-/8	—

### Tinted Cover Glasses.

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Masking, Rebinding, and Recovering .....		-/3	2/8

**General Photographic Work: Developing, Printing, Enlarging, Copying, Retouching, Finishing, &c., carried out by Experts.**

**ORIGINALS** are returned uninjured. Every care is taken of all negatives, prints, &c., whilst in our hands, but we can accept no responsibility for any accidents which may occur either in transit or otherwise.

**NEGATIVES.**—Negatives made by us in the process of producing Slides, &c., remain our property. Customers may, however, purchase them, if ordered at the same time as the Slides, at an extra charge of 6d. each.

Such negatives are stored under the names of the persons ordering—no copies being made except by their instructions. They are not kept longer than three years except by arrangement.

In the case of photographs of objects, specimens, original drawings, etc., we are open to make mutual arrangements for reproducing them if likely to be of value to us. We are also open to purchase, or to make arrangements to use, suitable negatives of subjects of interest to naturalists and others.

**COPYRIGHT.**—To prevent misunderstanding, we may state that practically all original drawings or photographs are copyright, whether so marked or not. It is necessary, therefore, to secure permission to have such works copied, and this should be done by the customer. Orders are executed on the understanding that such leave has been obtained. In any case the full responsibility remains with the person ordering the work to be done.

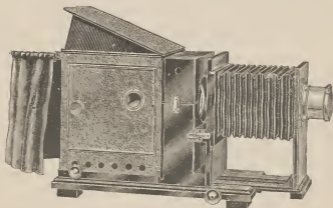
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We are prepared to undertake photographic work away from our studios, to copy originals which cannot be removed readily, or where a large amount of work warrants it. In such cases a special quotation will be given.

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*See Catalogue F.*



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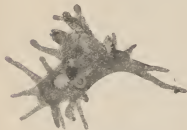


# ZOOLOGICAL SLIDES.

## Section AA 1—PROTOZOA.

Chiefly Photomicrographs.

Plain Slides, 1/3 each. Coloured, where suitable, 3/6 each.



Section AA1-4—Amoeba, x 100.

### RHIZOPODA.

- |                                     |   |
|-------------------------------------|---|
| 1 Actinospherium.                   | D |
| 2 Acanthocystis.                    | M |
| 3 Amoeba from life.                 | M |
| 4 Amoeba showing nucleus.           | M |
| 5 Arcella showing nucleus.          | M |
| 6 Diffugia with pseudopodia, x 150. | M |
| 7 Diffugia gramen, dividing, x 80.  | M |
| 8 Nebela, x 45.                     | M |
| 9 Nebela carinata, x 150.           | M |
| 10 Euglypha, x 80.                  | M |
| 11 Euglypha in division.            | M |
| 12 Cyphodeia ampulla, dividing.     | M |
| 13 Clathulina elegans, x 250.       | M |

### FORAMINIFERA.

- |                                                              |   |
|--------------------------------------------------------------|---|
| 20 Structure of various foraminifera.                        | D |
| 21 Globigerina ooze, x 25.                                   | M |
| 22 Globigerina from surface.                                 | D |
| 23 Foraminifera, Samoa, recent, Dark ground.                 | M |
| 24 Foraminifera, Barbadoes, recent, Dark ground.             | M |
| 25 Foraminifera, Val di Savena, Italy, Dark ground.          | M |
| 26 Chalk section, showing Forams, Trieste, x 9.              | M |
| 27 Fossil Foraminifera, isolated from Chalk, x 30.           | M |
| 28 Nummulite in horizontal Section, x 3.                     | M |
| 29 Nummulite, part in T.S., x 20.                            | M |
| 30 Miliolina, life appearance.                               | D |
| 31 Miliolina, Peneroplis, Vertebralina (Haeckel, 12).        | D |
| 32 Peneroplis pertusus.                                      | M |
| 33 Orbitolites, D.G., x 7.                                   | M |
| 34 Laguna, Bullmina, Bolivina, etc. (Haeckel, 81).           | D |
| 35 Nodosaria scalaris, x 30.                                 | M |
| 36 Globigerina bulloides.                                    | M |
| 37 Globigerina, Polystomella, Nummulites, etc. (Haeckel, 2). | D |
| 38 Orbulina, life appearance.                                | D |

- |                               |   |
|-------------------------------|---|
| 39 Planorbullina.             | D |
| 40 Polystomella crispa, x 25. | M |

### RADIOLARIA (recent).

- |                                      |   |
|--------------------------------------|---|
| 47 Radiolaria ooze, x 60.            | M |
| 48 Aulacantha, x 25.                 | M |
| 49 Collozoum.                        | M |
| 50 Spherozoum, part of colony, x 40. | M |
| 51 Radiozoum lobatum.                | M |
| 52 Heliodiscus solaster, x 80.       | M |
| 53 Pterocanium eucolpum, x 80.       | M |
| 54 Stylactis quadrata, x 80.         | M |
| 55 Euebitonia triacantha, x 80.      | M |

### RADIOLARIA (Fossil).

- |                                                         |   |
|---------------------------------------------------------|---|
| 56 Radiolaria, Barbadoes, arranged star.                | M |
| 57 Radiolaria, Barbadoes, strewn, dark ground, x 10.    | M |
| 58 Radiolaria, Barbadoes, strewn, Transp.               | M |
| 59 Radiolaria, Barbadoes, circle arranged, dark ground. | M |
| 60 Podocorytis, arranged star.                          | M |
| 61 Astromma aristotelis, x 80.                          | M |
| 62 Halionomma sol.                                      | M |
| 63 Saturnia elliptica, x 80.                            | D |
| 64 Heliodiscus (Haeckel, 11).                           | D |
| 65 Astrosphaera (Haeckel, 91).                          | D |
| 66 Collosphaera (Haeckel, 51).                          | D |
| 67 Xiphacantha (Haeckel, 41).                           | D |
| 68 Dorataspis (Haeckel, 21).                            | D |
| 69 Tympanidium (Haeckel, 71).                           | D |
| 70 Calocyclus (Haeckel, 31).                            | D |
| 71 Elaphospiris (Haeckel, 22).                          | D |
| 72 Aulographis (Haeckel, 61).                           | D |
| 73 Cirogonia (Haeckel, 1).                              | D |

### FLAGELLATES AND CILIATES.

- |                                                          |   |
|----------------------------------------------------------|---|
| 80 Euglena, x 40.                                        | D |
| 81 Euglena, life history.                                | D |
| 82 Ceratium tripos, x 40.                                | M |
| 83 Ceratium, Peridinium, Dinophysis, etc. (Haeckel, 14). | M |
| 84 Noctiluca, x 40.                                      | D |
| 85 Paramoecium.                                          | M |
| 86 Paramoecium in conjugation.                           | M |
| 87 Spirostomum, showing meganucleus.                     | M |
| 88 Lionotus anser, x 40.                                 | D |
| 89 Vorticella.                                           | M |
| 90 Actina.                                               | M |
| 91 Dendrocometes paradoxus, x 40.                        | M |
| 92 Stentor, Carebesium, Vorticella, etc. (Haeckel, 3).   | D |
| 93 Dinobryon, Uvella, Codonosiga, etc. (Haeckel, 13).    | D |

### PARASITIC PROTOZOA.

(See also Section AA-14.)

- |                                              |   |
|----------------------------------------------|---|
| 94 Trypanosomes, in human blood.             | M |
| 95 Monocystis, trophozoophite stage, x 80.   | M |
| 96 Monocystis, showing spores                | M |
| 97 Tertian malaria in human blood.           | M |
| 98 Haemagregarines, in snake's blood, x 200. | M |
| 99 Opalina, from Frog.                       | M |

## Section AA 2—PORIFERA (Sponges).

Plain Slides, 1/3 each.

Chiefly photomicrographs or photographs of Museum specimens.

- |                               |   |                                    |   |
|-------------------------------|---|------------------------------------|---|
| 1 Gastrula of chalk sponges.  | D | 7 Chalina monaxonida T.S., showing | M |
| 2 Canal systems of sponges.   | D | sporgine.                          | P |
| 3 Canal systems of sponges.   | D | 8 Cladochalina sp. (on shell).     | P |
| 4 Siliceous sponges, various. | D | 9 Sclerochalina sp.                | P |

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

Section AA 2—Porifera (Sponges)—Continued.

14	Chalinissa sp.	P	36	Hallebondria sp.	P
15	Semperella schulzii, lace sponge.	P	37	Pachmatismia sp.	P
16	Semperella schulzii, lace sponge, pore plates, x 4.	M	38	Ophilitaspongia sp.	P
17	Semperella schulzii, lace sponge, pore plates, x 40.	M	40	Polylophus philipensis.	P
18	Semperella schulzii, lace sponge, pore plates, x 180.	M	41	Phylo-spongia sp.	P
19	Eupicetella marshalli.	P	43	Stelospongia australis.	P
20	Eupicetella aspergillum, Venus flower basket.	P	46	Sycon ciliatum, E.	M
21	Eupicetella aspergillum, with crustacean inside.	P	47	Sycon ciliatum, T.S.	M
22	Hyalonema sp., glass-rope sponge.	P	48	Geodia gigas, T.S.	M
23	Hyalonema sp., sieve plates, enlarged.	M	50	Grantia compressa, T.S. (highly magnified).	M
26	Hyalonema sp., spicules, group.	M	51	Spongilia fluviatilis, T.S.	M
29	Tethya lynceurium, proliferated bud of.	M	54	Spicules, group of various forms.	M
30	Tethya lynceurium, T.S.	M	55	Spicules, group on dark ground.	M
31	Tethya lynceurium, spicules of.	M	56	"Turkey" Sponge, entire.	P
33	Suberites domuncula (worm and crab).	P	57	"Honeycomb" Sponge, entire.	P
35	Leucosolmia botryoides, entire, x 40.	M	58	Mediterranean Sponge Fisheries.	D
			60	Ascandra, Ascilla, Sycandra, Sycetta (Hæckel, 5).	D
			61	Farrea, Eupicetella, Hyalonema, Stylocalyx (Hæckel, 35).	D
			62	Hyalonema Owstoni, glass-rope sponge.	P

Section AA 3—HYDROZOA, Including "ZOOPLYTES" &c.

Plain Slides, 1/3 each.

Coloured, where suitable, 3/6 each.

1	Hydra fusca, E.	M.	48	Siphonophora, development of larva.	D
2	Hydra fusca, with buds.	M	49	Sarsia tubulosa, with medusiform buds.	M
3	Hydra fusca, showing parts.	D	50	Halicium halicinum.	M
4	Hydra fusca, thread cells.	D	52	British Medusæ. Forms of.	D
5	Hydra fusca, T.S.	M	53	Jelly Fish, Tentaculocysts.	M
6	Hydra, T.S., with testis, x 25.	M	54	Diphyys sieboldii.	P
7	Hydra fusca, L.S., showing ovum.	M	55	Sertularia, Diphasia (Hæckel, 25).	D
8	Hydra viridis, developing.	D	56	Campanularia obella (Hæckel, 45).	D
8a	Hydra viridis, with ovary & testes.	M	57	Sarsia. Tubuleta, Syncoryne (Hæckel, 6).	D
8b	Hydra, L.S., with ovary & testes.	M	58	Gemma, Tiara, Thamostylus (Hæckel, 46).	D
9	Cordylophora mutans, E.	M	59	Leptomedusæ Equorea, Polycanna (Hæckel, 36).	D
10	Berœ ovata larva, E. (Ctenophora).	M	60	Tracomedusæ Carnaris, Carnarina (Hæckel, 26).	D
11	Bougainvillea frutescens Medusa, E., x 40.	M	61	Narcomedusæ, Pegantha, Æginura (Hæckel, 16).	D
12	Coryne frutescens, E.	M	62	Porpæa, Porpalia, Distalia (Hæckel, 17).	D
14	Eudendrium racemosum, E., x 4.	M	63	Epibulia, Cystalia, Salacia (Hæckel, 7).	D
15	Eudendrium racemosum, E., x 25.	M	64	Discolabe (Hæckel, 37).	D
17	Gonothyrea loveni, E.	M	65	Strobalia (Hæckel, 39).	D
18	Nausithœ punctata Medusa, E.	M	66	Bassia, Praya (Hæckel, 77).	D
19	Obelia geniculata, E., x 15.	M	67	Hormiphora, Callianira (Hæckel, 27).	D
20	Obelia Medusa, x 40.	M	68	Stauromedusæ, Haliclystus, Lucernaria (Hæckel, 49).	D
21	Obelia Medusa, with prey.	M	69	Peromedusæ, Periphylla (Hæckel, 38).	D
22	Pennaria cavolinia, nat. size, E.	P	70	Cubomedusæ, Chirodromus, Charybdea (Hæckel, 78).	D
25	Plumularia pinnata, enlarged.	M	71	Discomedusæ, Linantba, Strobilla (Hæckel, 18).	D
27	Porpita Mediterranea, E., x 18.	M	72	Discomedusæ, Aurelia Pelegria (Hæckel, 98).	D
29	Sertularia pumila, enlarged.	M	73	Discomedusæ, Toreuma, Cassiopeja (Hæckel, 28).	D
30	Sertularia, on shell of pecten.	P	74	Discomedusæ, Pilema, Rhopilema (Hæckel, 28).	D
31	Sertularia, with parasitic shells.	P	76	Porpita, tentacle.	M
32	Tubularia larynx, E., x 10.	M			
33	Velella spirans larva, E.	M			
34	Haliclystus octoradiata (Lucernarian).	P			
35	Haliclystus octoradiata, front view.	M			
36	Haliclystus octoradiata, front view, dark ground.	M			
38	Physalia aretusa, from model.	D			
40	Aurelia aurita, life history.	D			
43	Cydlippe plumosa.	D			
47	Siphonophora, development of larva.	D			

Section AA 4—ANTHOZOA.

(Anemones, Corals, etc.)

Plain Slides, 1/3 each.

Coloured, where suitable, 3/6 each.

1	Aleyonium, surface section.	M	10	Corallium rubrum.	P
3	Aleyonium, various forms.	D	11	Corallium japonicum, etc.	D
4	Aleyonium, trans. section body.	D	13	Tubipora musica (organ pipe coral).	P
5	Aleyonium, Clavularia and Gorgonia in L.S.	D	14	Coral reefs atolls.	P
6	Antipathes larix, x 10.	M	15	Gorgonia sp. (Sea fan).	P
7	Ceriantbus (various) group.	D	17	Gorgonia sp., enlarged to show pores.	P
			18	Gorgonia cavolinii, showing Polypa.	P

"Hæckel," from "Kunst Formen der Natur"—a Collection of Drawings in Colour of Beautiful Natural Objects by the late Ernst Hæckel.

Section AA 4—Anthozoa—Continued.

19 Gorgonia cavolinii, showing Polyps more highly magnified.	M
20 Gorgonia, group of spicules, various.	M
22 Gorgonia, etc., strewn slide of spicules, various.	M
23 Pennatula phosphorea E., showing Polyps.	P
24 Pennatula, portion. Enlarged.	M
25 Pennatula, portion, surface view, body wall.	M
27 Anemone (living) on rock.	P
28 Sand Anemone (living).	P
29 Adamsia (anemone) on hermit crab.	D
30 Actinia, Long Sect. Body.	D
31 Actinia, Edwardsia, Zoanthus and Ceriantbus in T.S.	D
32 Dahlia Anemone, Tealia crassicornis.	P
33 Opelet Anemone.	P
34 Daisy Anemone.	P

GROUPS OF ANEMONES.

From a fine series of drawings, very effective when coloured. The chief varieties on each plate are mentioned.

36 Actinia, Sagartia, Anthea, Tealia.	
37 Actinia, Aiptasia, Helicactis, Bunodes.	
38 Anemone, Actinia, Bunodes, etc.	
39 Bunodiopsis, Bunodes, Aulactinia.	
40 Polythoa, various types.	
42 Aiptasia, various types.	
43 Corynactis, Zoanthus, Aureliania, etc.	
44 Lophilia, Peachia, Paracyanthus, Hoplangia.	
45 Phyllia, Gregoria, Edwardsia, Ceriantbus.	
46 Sagartia, Adamsia, Lasterra.	
47 Cladactis.	
48 Tealia, Bunodis.	
49 Ragaetis, Anemone, Paranthus, Paractinia.	
60 Halcampa, Actinia, Metridium, Sagartia, Bunodes.	

CORALS.

From fine examples in the Manchester

Museum.	
55 Fungia ehrenbergii.	P
56 Fungia sp.	P
57 Galaxea clavus.	P
58 Galaxea hystrix.	P
59 Goniastrea favus.	P
60 Madrepora depressa.	P
61 Madrepora nasuba.	P
62 Madrepora pyramidalis.	P
63 Madrepora robusta.	P
64 Madrepora scabrosa.	P
65 Madrepora superba.	P
67 Madrepora surculosa.	P
68 Madrepora species.	P
69 Meandrina strigosa.	P
70 Merulina amplexata.	P
71 Mussa bonegemanni.	P
72 Mussa echinata.	P
73 Pachyseris rugosa.	P
74 Pavonia preborta.	P
75 Pocillopora acuta.	P
76 Pocillopora grandis.	P
77 Porites monteculosa.	P
78 Serratopora eculata.	P
79 Tridacophyllia manicina.	P
80 Turbinaria cinaraseus.	P
81 Turbinata species.	P
82 Ullophyllia cellulosa.	P

FROM DRAWINGS.

83 Gorgonia, Primnoella, Euplexaura (Hæckel, 39).	D
84 Pennatula, Umbellula, Renilla (Hæckel, 19).	D
85 Actinias, Hellastis, Aiptasia, Metridium, (Hæckel, 49).	D
86 Turbinaria, Astræ, Manicina (Hæckel, 69).	D
87 Meandrina, Lophohelia, Madrepora (Hæckel, 9).	D

Section AA 5—WORMS.

Plain Slides, 1/3 each.

See also Section AA 10, Animal Parasites.

PLATYHELMINTHES—Flatworms.

1 Thysanozoon brocchii.	M
2 Lento plana tremellaris.	M
3 Polycelis nigra.	P
4 Mesostomum ehrenbergi, x 8.	M
5 Phyllonella soleæ, external parasite, sole.	M

ANNELIDA.

23 Pontohdella muricata—Skate Leech.	M
24 Amphidinea mediterranea, x 15.	P
25 Aphrodite aculeata, sea mouse	P
26 Euphrosyne foliosa.	D
27 Arenicola sp., lugworm.	D
28 Autolytus, asexual generation, sexual buds, x 10.	M
29 Autolytus, male sexual generation, x 15.	M
30 Autolytus, female sexual generation, x 12.	M
31 Alclopa krohnii, x 6.	M
32 Cirratulus sp., head, x 6.	M
33 Glycera sp., x 2.	M
34 Hermione sp., x 10.	D
35 Hirudo medicinalis.	D
36 Lumbricus terrestris, earthworm, T.S.	M
37 Lumbricus terrestris, earthworm, L.S.	M
38 Nerine vulgaris, front and side (anterior).	D
39 Nereis, Arenicola, Glycera, Phyllococe.	P
40 Myrjana pennigera, x 1½.	M
41 Myzostoma cirrifera.	P
42 Nereis sp., x 4.	P

43 Nereis sp., x 25.	M
44 Heteronereis sp.	P
45 Nereis, Lepidonotus, Spirorbis.	D
46 Nereis, anatomy of.	D
47 Annelida, anatomy of eyes.	D
48 Ophryotrocha puerilis.	M
49 Polygordius, development of.	D
49a Polygordius larva.	M
50 Phyllococe, anterior end, pharynx extended, x 12.	M
51 Pionosyllis hamelligera, head, x 70.	M
52 Sabella pavonia (museum specimen).	P
53 Sabella pavonia, in aquarium.	P
54 Sabella sp.	D
55 Salmacina sedficatrix.	M
56 Serpula sp.	D
57 Spirorbis sp., x 18.	M
58 Terebella sp., x 14.	M
59 Tubicolous worms.	D
60 Terebella, showing tube building	D
61 Terebellians leucodorians.	D
62 Tomopteris scolopendra.	M
63 Tomopteris scolopendra, mature.	M
64 Sabella (Hæckel, 96) (col. 4/6) D	

CHÆTOGNATHA.

65 Sagitta sp., x 10.	M
66 Spadella draco, x 7.	M

All Slides may be had Plain—unless otherwise stated.  
 P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section  
 L.S.—Longitudinal Section.

**Section AA 6—ROTIFERA.**

A large number of slides including all the principal forms are available. List on application. Price, plain only, 1/- each.

**Section AA 7—CRUSTACEA.**

Chiefly photographs and photomicrographs.

Plain Slides, 1/3 each. Coloured, where suitable, 3/- each.

(See also Sections AA 26 and AA 27.)

**ISOPODA.**

- 1 Asellus aquaticus, water louse. M
- 2 Porcellio scaber, woodlouse. P

**AMPHIPODA.**

- 3 Caprella acutifrons, phantom shrimp, x 10. M
- 4 Chelura terebrans, x 35. M
- 5 Gammarus pulex. M
- 6 Nebalia sp., sand hopper (Leptostracha). M

**SCHIZOPODA.**

- 9 Mysis sp., young, x 11. M
- 10 Mysis sp., development. D
- 11 Mysis sp., ooliths in tail of. M

**DECAPODA.**

- 12 Astacus fluviatilis, fresh-water crayfish. P
- 13 Astacus fluviatilis, T.S., carapace. M
- 14 Astacus fluviatilis, V.S., eye. M
- 15 Carcinus mœnas, shore crab, zœa stage. M
- 16 Carcinus mœnas, megalopa stage. M
- 17 Carcinus mœnas, mature. P
- 18 Cancer pagurus, crab. P
- 19 Corystes cassivelaunus, crab. P
- 21 Ebella cranchii, crab. P
- 22 Eupagurus prideauxii, hermit crab in shell. P
- 25 Galathea nexa. P
- 26 Homarus vulgaris, lobster, development. D
- 27 Homarus vulgaris, young, x 6. M
- 28 Homarus vulgaris, mature. P
- 29 Lobster potting. D
- 30 Hysa coarctatus, spider crab. P
- 31 Nephrops norvegicus, Norway crayfish. P
- 32 Pagurus sp., hermit crab, with anemone on shell. D
- 33 Palaemon squilla, zœa stage. M
- 34 Penæus sp., prawn, nauplius. D
- 35 Penæus sp., prawn, proto zœa stage. M
- 36 Common Prawn, from life. P
- 37 Portunus corrugatus, velvet crab. P
- 38 Portunus deceptor, velvet crab. P
- 39 Portunus puber, velvet swimming crab. P
- 40 Porcellana platycheles, porcelain crab, zœa stage. M
- 41 Porcellana platycheles, young, male and female. P
- 42 Scyllarus actus, phyllosoma larva. M

**STOMATOPODA.**

- 45 Squilla desmarestii, Alma stage. M
- 45a Pisa Gibbsii, with seaweed on back. P

**ENTOMOSTRACA.**

**Phylozoa and Copepoda.**

- 46 Apus cancriformis, upper and under. P
- 46a Apus cancriformis, young, x 20. M
- 47 Apus cancriformis, appendage, x 8. M
- 48 Anchorella sp., male and female, x 10. M
- 49 Hyalophyllum vitreum, x 20. M
- 50 Entomostraca from marine Plankton. M
- 51 Daphnia sp., water flea. M
- 52 Leptodora hyalina, x 5. M
- 53 Leptodora hyalina, dark ground. M
- 54 Diaptomus castor, x 15. M
- 55 Cyclops sp., male. M
- 55a Cyclops sp., female. M
- 56 Sapphirina fulgens, x 10. M
- 57 Argulus foliaceus, carp louse. M
- 58 Lipeocephtrous sp., parasite of sun fish. M
- 59 Caligus sp., female, from cod. M
- 60 Lepas anatifera, barnacle, development. D
- 61 Lepas anatifera. P
- 62 Lepas anatifera, plume. M
- 63 Lepas anatifera, on block of wood. P
- 64 Lepas anatifera, on block of wood, partly cleared. P
- 65 Lepas anatifera, borings in wood. P
- 66 Balanus perforatus, acorn barnacle, nauplius stage. M
- 67 Balanus perforatus, cypris stage. M
- 68 Balanus perforatus, on shell. P

**DIAGRAMS.**

- 69 Idothea, Astacilla, Ziezia. D
- 70 Euparurus and Galathea. D
- 71 Carcinus mœnas, development. D
- 72 Shrimp and prawn. D
- 73 Portunus and Stenorhynchus. D
- 74 Orchestria, Corophium, Caprella. D
- 75 Copepoda, Calanus, Sapphirina (Hæckel, 56). D
- 76 Cirrepedia, Lepas, Sacculina (Hæckel, 57). D
- 77 Thoracostraca, Lucifer, Alma, Carcarini (Hæckel, 76). D
- 78 Decapoda, Parthenope, Pisa, Palaemon (Hæckel, 56). D
- 79 Cypris sp. M
- 83 Paratemia zeitziana, Brine Shrimp from Australia. M

**Section AA 8—ARACHNIDA. Spiders, Mites, &c.**

Plain Slides, 1/3 each. Coloured, where suitable, 3/- each.

- 1 Spiders' webs on hedge. P
- 2 Epeira diadema, garden spider with web. P
- 3 Epeira diadema, under slide, enlarged. 3/- P
- 4 Epeira diadema, in web. 3/- P
- 5 Epeira diadema, den. P
- 6 Epeira coronata, nests on Reed. P
- 7 Tegenaria derhamii, House Spider, male and female. P
- 8 House Spider, nest and web in angle of door. P
- 9 Spider with Blowfly. P
- 10 Tibellus oblongus, several specimens. P
- 11 Tetragnatha extensa, several specimens. P
- 12 Trechosa cinerea, male and female. P
- 13 Xysticus cristatus, male and female. P
- 14 Xysticus cristatus. D
- 15 Argyroneta aquatica (living). P

"Hæckel," from "Kunst Formen der Natur"—a Collection of Drawings in Colour of Beautiful Natural Objects by the late Ernst. Hæckel.

**Section AA 8—Arachnida. Spiders, Mites, &c.—Continued.**

16 Snare of <i>Hyptiotes paradoxus</i> .	D	47 <i>Rhyncolopus plumipes</i> , on moss.	P
17 <i>Atypus affinis</i> .	D	48 <i>Rhyncolopus plumipes</i> , male.	M
18 <i>Ephilemum scenicum</i> —Jumping Spider.	P	49 <i>Glycyphagus canestrinii</i> , male and female.	M
19 Snare of <i>Linyphia</i> .	D		
20 <i>Linyphia</i> —Webs on grasses.	P		
21 <i>Aranca obtectrix</i> , web with dewdrops.	P		
22 <i>Agroeta lahyrthica</i> (nest of).	P		
23 <i>Agroeta brunnea</i> , unfinished cocoon.	P		
24 <i>Meta menardi</i> , Cave Spider, cocoon.	P		
25 South African Spiders and nest.	P		
26 Trap-door Spider and nest.	P		
27 Trap-door Spider, nest in situ.	P		
28 <i>Tarantula mygale</i> .	P		
29 <i>Tegenaria</i> sp., jaws.	M		
30 Jumping Spider, jaws.	M		
31 <i>Argyrotaea</i> , jaws and palpi.	M		
32 Foot of spider, combs.	M		
33 Spinorettes of spider.	M		
34 Harvestmen at rest on Sandstone.	P		
		<b>PHYCNOGONIDA.</b>	
		60 <i>Pallene</i> sp. (sea spider).	M
		61 Pycnogonid gall, on coryne.	M
		<b>SCORPIONS.</b>	
		62 <i>Buthus</i> sp., from Jamaica.	P
		63 <i>Scorpio megacephalus</i> .	P
		<b>CHELIFERÆ (Pseudoscorpions).</b>	
		69 Chelifer canroidea.	M
		70 <i>Obisium muscorum</i> .	M
		<b>XYPOSURA.</b>	
		76 <i>Limulus polyphemus</i> , trilobite stage.	M
		77 <i>Epeira</i> (Hæckel, 66).	D
		78 <i>Limulus</i> (Hæckel, 47).	D
<b>ACARINI (Mites).</b>			
45 <i>Aranus quadratus</i> .	D		
46 <i>Gamasus colopratorum</i> , beetle mite.	M		

**Section AA 9—ORTHOPTERA.**

Plain Slides, 1/3 each. Coloured, where suitable, 3/6 each.

(See also Domestic Pests, Section AA 19.)

1 Cockroach, <i>Periplaneta orientalis</i> .	P	9 Cricket, <i>Elytron</i> .	P
2 Cockroach, dissection, male and female.	P	10 Cricket, jumping leg.	P
3 Cockroach, canal and gizzard, x 3½	M	11 Mole Cricket, <i>Gryllotalpa</i> .	P
4 Cockroach, gizzard, x 10.	M	12 Mole Cricket, foreleg, digging claws.	P
5 Giant Cockroach, <i>Blaber gigantea</i> .	P	13 Locust, expanded wings.	P
6 Giant Cockroach, <i>Blaber marmorata</i> .	P	14 Locust, life history.	P
7 Giant Cockroach, <i>Rhyparohia madere</i> .	P	15 Grasshopper, from life.	P
8 Field Cricket, <i>Gryllus campestris</i> , stages.	P	16 Lantern Fly, <i>Fulgora lanternaria</i> , Peru.	P

**Section AA 10—BRITISH BUTTERFLIES AND MOTHS.**

Principally photographs of living specimens. The Larvæ usually on food plants. The Perfect Insects are, with few exceptions, taken from specimens in the open. The Metamorphoses are from arranged Museum Specimens.

Plain Slides, 1/6 each. Coloured, where suitable, 3/6 each.

(See also Sections AA 20, Horticultural, etc., Pests; AA 21, Protective Resemblance and Mimicry.)

**BUTTERFLIES.**

1 <i>Machaon</i> , Swallow Tail, larva.		23 Urticæ, Small Tortoiseshell, larvæ and pupæ, various stages.	
2 <i>Machaon</i> , Swallow Tail, pupa.		24 Urticæ, Small Tortoiseshell, pupa.	
3 <i>Machaon</i> , Swallow Tail, imago, wings open.		25 to 31 Urticæ, Small Tortoiseshell, emergence from pupa. (A series of 6 slides.)	
4 <i>Machaon</i> , Swallow Tail, imago, wings closed.		32 Urticæ, Small Tortoiseshell, imago, wings open.	
5 <i>Machaon</i> , Swallow Tail, metamorphosis.		33 <i>Io</i> , Peacock imago, open.	
6 <i>Brassica</i> , Large White, eggs and young larvæ.		34 <i>Atalanta</i> , Red Admiral, larva tent.	
7 <i>Brassica</i> , Large White, larvæ on leaf.		35 <i>Atalanta</i> , Red Admiral, imago, open.	
8 <i>Brassica</i> , Large White, imago and pupa case.		36 <i>Papilio</i> , Silver-washed Fritillary, eggs.	
9 <i>Brassica</i> , Large White, metamorphosis.		37 <i>Papilio</i> , Silver-washed Fritillary, larva.	
10 <i>Brassica</i> , Large White, with microgaster cocoons.		38 <i>Papilio</i> , Silver-washed Fritillary, pupa.	
11 Rape, Green Veined White, eggs on leaf.		39 <i>Papilio</i> , Silver-washed Fritillary, imago on thistle.	
12 Rape, larvæ.		40 <i>Euphrosyne</i> , Pearl-bordered Fritillary, imago.	
13 <i>Napi</i> , Orange Tip, imago on scabious.		41 <i>Selene</i> , Small Pearl-bordered Fritillary, imago closed.	
14 <i>Iris</i> , Purple Emperor, pupa.		42 <i>Selene</i> , Small Pearl-bordered Fritillary imago open.	
15 <i>Silylla</i> , White Admiral, eggs.		43 <i>Galatea</i> , Marbled White, closed.	
16 <i>Silylla</i> , White Admiral, larva.		44 <i>Galatea</i> , Marbled White, open.	
17 <i>Silylla</i> , White Admiral, pupa.		45 <i>Hyperanthus</i> , ringlet, imago.	
18 <i>Silylla</i> , White Admiral, imago.		46 <i>Pamphilus</i> , Small Heath, imago.	
19 <i>C-album</i> , Comma, egg.		47 <i>Argiolus</i> , Azure Blue, eggs.	
20 <i>Polychorus</i> , Large Tortoiseshell, brood young larvæ.		48 <i>Lucina</i> , Duke of Burgundy Fritillary, imago.	
21 <i>Polychorus</i> , Large Tortoiseshell, larva.		49 <i>Malva</i> , Grizzled Skipper.	
22 Urticæ, Small Tortoiseshell, larva.			

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

Section AA 10—British Butterflies and Moths—Continued.

**MOTHS—SPHINGIDÆ, Etc.**

- 50 Tilia, Lime Hawk, larvæ.  
 61 Populi, Poplar Hawk, eggs.  
 62 Populi, Poplar Hawk, larvæ.  
 63 Populi, Poplar Hawk, male, imago just emerged.  
 64 Populi, Poplar Hawk, imago at rest.  
 65 Populi, Poplar Hawk, metamorphosis.  
 66 Ocellatus, Eyed Hawk, larva.  
 67 Atropos, Death's Head, larva.  
 68 Atropos, Death's Head, pupa.  
 69 Atropos, Death's Head, imago.  
 70 Atropos, Death's Head, metamorphosis.  
 71 Convolvuli, Convolvulus Hawk.  
 72 Convolvuli, Convolvulus Hawk, imago.  
 73 Ligustri, Privet Hawk, larva.  
 74 Ligustri, Privet Hawk, pupa.  
 75 Ligustri, Privet Hawk, imago on tree trunk.  
 76 Ligustri, Privet Hawk, metamorphosis.  
 77 Pinastri, Pine Hawk, metamorphosis.  
 78 Elpenor, Elephant Hawk, larva.  
 79 Elpenor, Elephant Hawk, imago, side view.  
 80 Elpenor, Elephant Hawk, from above.  
 81 Fuciformis, Broad-bordered Bee Hawk, larva with Ichneumon.  
 82 Fuciformis, Broad-bordered Bee Hawk, imago.

**MOTHS—NOTODONTIDÆ, Etc.**

- 93 Vinula, Puss Moth, eggs.  
 94 Vinula, Puss Moth, larva.  
 95 Vinula, Puss Moth, pupa.  
 96 Vinula, Puss Moth, imago.  
 97 Fagi, Lobster, larva.  
 98 Ziczac, Pebble Prominent, larva.  
 99 Bucephala, Buff Tip, eggs.  
 100 Bucephala, Buff Tip, larvæ, group.  
 101 Bucephala, Buff Tip, larva.  
 102 Bucephala, Buff Tip, Moth at rest.  
 103 Bucephala, Buff Tip, imago open.  
 104 Antigua, Vapourer, larva.  
 105 Antigua, Vapourer, female, cocoon and eggs.  
 106 Padibunda, Pale Tussock, larva.  
 107 Padibunda, Pale Tussock, imago, side view.  
 108 Padibunda, Pale Tussock, imago, top view.  
 109 Padibunda, Pale Tussock, metamorphosis.  
 110 Dispar, Gipsy Moth, larva.  
 111 Neustria, Lockey, larvæ.  
 112 Quercus, Oak Eggar, larvæ.  
 113 Quercus, Oak Eggar, cocoon.  
 114 Potatoria, Drinker, larva.  
 115 Potatoria, Drinker, imago at rest.  
 116 Potatoria, Drinker, metamorphosis.  
 117 Pavonia, Emperor, larva.  
 118 Menthastræ, White Ermine, eggs.  
 119 Lubrielpeda, Buff Ermine, larva.  
 120 Caja, Tiger, imago at rest.  
 121 Jacobææ, Cinnabar, larva on ragwort.  
 122 Jacobææ, Cinnabar, single larva, larger.

**MOTHS—NOCTUIDÆ.**

- 133 Megacephala, Poplar Grey, larvæ.  
 134 Megacephala, Poplar Grey, pupa under bark.

- 135 Psi, Grey Dagger, larvæ.  
 136 Psi, Grey Dagger, imago.  
 137 Fimbria, Broad-bordered Yellow Underwing, larva.  
 138 Fimbria, Broad-bordered Yellow Underwing, imago.  
 139 Persicariæ, Dot, larva.  
 140 Oleraciæ, Brownline Brighteye, larva.  
 141 Pisi, Broom, larva.  
 142 Cereuleocephala, Figure of 8, larva.  
 143 Cereuleocephala, Figure of 8, killed by Ichneumons.  
 144 Popularis, Feathered Gothic, eggs, x 9.  
 145 Popularis, Feathered Gothic, eggs, group on leaf.  
 146 Chi, imago on wall.  
 147 Nubeculosa, Rannock Sprawler, imago.  
 148 Lucipara, Small Angleshades, larva.  
 149 Stablis, Common Quaker, eggs.  
 150 Griseo-variegata, Pine Beauty, larva.  
 151 Areola, early grey, imago.  
 152 Absinthii, Wormwood Shark, larvæ.  
 153 Gamma, Silver Y, cocoon.  
 154 Sponsa, Dark Crimson Underwing, eggs, pierced by Ichneumons.  
 155 Sponsa, Dark Crimson Underwing, larva.  
 156 Sponsa, Dark Crimson Underwing, pupa.  
 157 Sponsa, Dark Crimson Underwing, imago.

**GEOMETRÆ, Etc.**

- 168 Strataria, Oak Beauty, imago.  
 169 Betularia, Peppered Moth, eggs.  
 170 Betularia, Peppered Moth, larva.  
 171 Bidentata, Scalloped Hazel, larva.  
 172 Designata, Flame Carpet, imago on sandstone.  
 173 Dilutata, November, imago on Alder branch.  
 174 Lichenaria, Brussels Lace, larva.  
 175 Crepuscularia, Small Engrailed, imago.  
 176 to 184 *Filipendula*, Six-Spotted Burnet. A series of 8 slides showing emergence from cocoon.  
 185 Cossus, Goat Moth, larva.  
 186 Cossus, Goat Moth, pupa and imago.  
 187 Cossus, Goat Moth, metamorphosis.  
 188 Apiformis, Hornet Clearwing of Poplar male and female.

- 199 Types of pupæ of Butterflies.  
 200 Types of pupæ of Moths.  
 201 Types of Moths with Apterous females.

**PHOTOMICROGRAPHS.**

- 207 Section of Silk Worm, showing glands. M  
 etc.  
 208 Trachea of Silk Moth, highly magnified. M  
 209 Leg and proleg of Goat Moth larva, showing hooks. M  
 210 Scales from wing of Butterfly. M  
 211 Portion of wing of Common Blue, underside highly magnified. M  
 212 Antennæ, of Butterfly and Moth. P  
 213 Head of Butterfly, showing proboscis. P

Section AA 11—EXOTIC LEPIDOPTERA.

A few examples of beautiful form and colour. Coloured Slides only, 3/6 each.

**BUTTERFLIES.**

- 1 *Morpho didius*, Peru.  
 2 *Papilio coluces*.  
 3 *Papilio turnus* (U.S.A.).  
 4 *Papilio joëns* (Queensland).  
 5 *Papilio memereon* and *P. coon*.  
 6 *Ternopalpus imperialis* (India).  
 7 *Precis scissimus* (Africa).  
 8 *Parthenos sylvia* (N. Guinea).  
 9 *Tachyris zarinda*.  
 10 *Hebomoia glaucippe* (India).

- 11 *Parnassius imperator*.  
 12 *Erasmia pulchella* (China).  
 13 *Urania ripheus*, Madagascar.  
 14 *Euploea midamus*, Assam.

**MOTHS.**

- 15 *Attacus atlas* (Assam).  
 16 *Tropea luna* (Kansas).  
 17 *Actias selene* (Assam).  
 A number of slides of foreign silk moths and larvæ—list on application.

Storage Cabinets for Slides in all sizes—See Cover.

**Section AA 12—COLEOPTERA**

Principally photographs from life. Plain Slides 1/3 each.

(See also Section AA 20.)

We also have good photographic slides of many of the commoner British Beetles.  
List on application.

- |                                                                   |                                                        |
|-------------------------------------------------------------------|--------------------------------------------------------|
| 1 Stag Beetle, <i>Lucanus cervus</i> .                            | 10 Glowworm, on grass, female.                         |
| 2 Stag Beetles fighting.                                          | 11 <i>Chrysomela marginata</i> , alive in grass.       |
| 3 Burying Beetle ( <i>Necrophorus</i> ) at work.                  | 12 <i>Chrysomela sanguinea</i> , life history.         |
| 4 Horned Dung Beetle, <i>Geotrope typhocus</i> , male and female. | 13 Oil Beetle, meloe <i>proscaraboeus</i> .            |
| 5 Egyptian Scarab Beetle, male and female.                        | 14 Bombardier Beetle, male and female.                 |
| 6 <i>Anchomenus assimile</i> hibernating.                         | 15 Devil's Coach-horse, <i>Ceypus olens</i> .          |
| 7 Glowworm, egg on grass.                                         | 16 Pupresid larva from American pine.                  |
| 8 Glowworm, larva.                                                | 17 Goliath (largest) and smallest beetles.             |
| 9 Glowworm, larva on palm of hand.                                | 18 <i>Hispalia spuria</i> , Natal, x 10.               |
|                                                                   | 19 Cockchafer, <i>Melolontha vulgaris</i> (dissected). |

**Section AA 13—DIPTERA.**

(See also Section AA 14.)

Plain Slides, 1/3 each.

**DIVISION I—THE HOUSE FLY AND SOME OF ITS ALLIES.**

Those marked \* are reproduced by permission from the Monograph of the late Dr. C. Gordon Hewitt.

**The House Fly—*Musca domestica*.**

- |                                                                                   |   |
|-----------------------------------------------------------------------------------|---|
| 0 <i>Musca domestica</i> , ova, x 22.                                             | M |
| 1 <i>Musca domestica</i> , ova, group in situ.                                    | M |
| 2 <i>Musca domestica</i> , group of larvae.                                       | P |
| 3 <i>Musca domestica</i> , group of pupae.                                        | P |
| 4 <i>Musca domestica</i> , from life, from above.                                 | P |
| 5 <i>Musca domestica</i> , from life, side view, at sugar.                        | P |
| 6* <i>Musca domestica</i> , house fly.                                            | D |
| 7* <i>Musca domestica</i> , right wing.                                           | D |
| 8* <i>Musca domestica</i> , interior of head and proboscis.                       | D |
| 9* <i>Musca domestica</i> , section oral lobe proboscis.                          | D |
| 10* <i>Musca domestica</i> , alimentary canal.                                    | D |
| 11* <i>Musca domestica</i> , tracheal system of anterior thoracic spiracle.       | D |
| 12* <i>Musca domestica</i> , tracheal sacs connected with post thoracic spiracle. | D |
| 13* <i>Musca domestica</i> , left half of thoracic exoskeleton.                   | D |
| 14* <i>Musca domestica</i> , alimentary canal, larva.                             | D |
| 15* <i>Musca domestica</i> , cephalopharyngeal skeleton of larva.                 | D |
| 16* <i>Musca domestica</i> , abdomen and ovipositor.                              | D |
| 17* <i>Musca domestica</i> , interior of right half abdomen.                      | D |
| 18* <i>Musca domestica</i> , nervous system.                                      | D |
| 19* <i>Musca domestica</i> , larva.                                               | D |
| 20* <i>Musca domestica</i> , pupae case.                                          | D |
| 21* <i>Musca domestica</i> , post. ends of 2nd and 3rd larval stages.             | D |
| 22* Culture plate, showing bacteria colonies from feet of fly.                    | D |
| 23 <i>Musca domestica</i> , eye, showing facets                                   | M |
| 24 <i>Musca domestica</i> , leg                                                   | M |
| 25 <i>Musca domestica</i> , foot, showing pulvilli                                | M |
| 26 <i>Musca domestica</i> , wing.                                                 | M |
| 27 <i>Musca domestica</i> , wing portion enlarged.                                | M |
| 28 <i>Entomophthora musae</i> , fungus disease of house-fly.                      | M |

**THE BLOW-FLY—*Calliphora erythrocephala*, or nearly allied species.**

- |                                                             |   |
|-------------------------------------------------------------|---|
| 29 <i>Calliphora</i> , blow-fly, egg.                       | M |
| 30 <i>Calliphora</i> , blow-fly, young, larva               | M |
| 31 <i>Calliphora</i> , blow-fly, from above                 | P |
| 32 <i>Calliphora</i> , blow-fly, side view                  | P |
| 33 <i>Calliphora</i> , erythrocephala resting on pine trunk | P |
| 34 <i>Calliphora</i> , tongue and mouth organs              | M |
| 37 <i>Calliphora</i> , V.S. head through eyes               | M |
| 38 <i>Calliphora</i> , wing                                 | M |

**THE LESSER HOUSE FLY—*Fannia* sp.**

- |                                                       |   |
|-------------------------------------------------------|---|
| 39 <i>Fannia</i> sp., ova in situ on wasp's nest      | P |
| 40 <i>Fannia</i> sp., ova enlarged                    | M |
| 41* <i>Fannia</i> sp., larva                          | D |
| 42 <i>Fannia</i> sp., pupae, x 6                      | M |
| 43 <i>Fannia</i> sp., at rest, x 5                    | M |
| 44 <i>Fannia</i> sp., male and female, wings extended | M |
| 45* <i>Fannia canicularia</i>                         | D |
| 46 Stable Fly, <i>Stomoxys calcitrans</i> at rest     | P |
| 47* Stable Fly, <i>Stomoxys calcitrans</i>            | D |
| 48 Stable Fly, <i>Stomoxys</i> mouth organs           | M |
| 49* Root Maggot Fly, <i>Anthomyia</i> sp.             | D |
| 50 <i>Anthomyia pluvialis</i> , male, x 2½            | P |

**DIVISION II.—SOME OTHER DIPTERA.**

- |                                                                  |   |
|------------------------------------------------------------------|---|
| 57 <i>Volucella</i> sp., x 2                                     | M |
| 58 <i>Volucella</i> , tongue                                     | M |
| 59 <i>Asilus crabroformis</i> , male and female                  | P |
| 60 <i>Fungus Gnat</i> , <i>Mycetophila rufescens</i> , male x 5½ | M |
| 61 <i>Leptis scolopacea</i> , on Aspen bole                      | P |
| 62 <i>Pegomyia hyocymai</i> , eggs, x 10                         | M |
| 63 Dung Fly, <i>Scatophaga stercoraria</i> , eggs in dung x 11   | M |
| 64 Dung Fly, eggs removed, side view, x 11                       | M |
| 65 <i>Eristalis tenax</i> , larva                                | P |
| 66 <i>Eristalis tenax</i> , Imago                                | P |

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

**Section AA 14—BLOOD SUCKING FLIES**

and the Diseases they carry.

A new series, mostly photographs and photomicrographs. Plain Slides 1/3 each.

1 Table of diseases and insect carriers of same.	D	21 <i>Culicomyia nebulosa</i> (S. Africa), head and mouth organs.	M
2 <i>Anopheles</i> , Typical breeding place.	P	22 <i>Stegomyia fasciata</i> yellow fever fly, egg × 10.	M
3 <i>Anopheles maculipennis</i> , egg.	M	23 Malarial Parasites and <i>Anopheles</i> , stages.	D
4 <i>Anopheles maculipennis</i> , larva.	M	24 Malarial Parasites in stomach of <i>Anopheles</i> .	M
5 <i>Anopheles maculipennis</i> , pupa.	M	35 Various sporozoa (Coccidium etc.).	D
6 <i>Anopheles maculipennis</i> , male insect.	M	36 <i>Stomoxys calcitrans</i> , Stable Fly, × 2.	P
7 <i>Anopheles maculipennis</i> , female insect.	M	37 <i>Stomoxys calcitrans</i> , Stable Fly, M.F. and head.	M
8 <i>Anopheles bifurcatus</i> , female at rest, side view.	M	38 <i>Glossina morsitans</i> , Tsetse Fly, side view.	P
9 <i>Culex pipiens</i> , Gnat, egg raft.	M	39 <i>Glossina brevipalpis</i> , Tsetse Fly, side view.	P
10 <i>Culex pipiens</i> , Gnat, larva.	M	40 <i>Glossina palpalis</i> , Tsetse Fly.	D
11 <i>Culex pipiens</i> , Gnat, pupa.	M	41 <i>Glossina palpalis</i> , head.	M
12 <i>Culex pipiens</i> , Gnat, female insect.	M	42 <i>Glossina maculata</i> , Tsetse Fly.	D
13 <i>Culex pipiens</i> , Gnat, female insect.	M	43 <i>Trypanosoma brucei</i> , in blood, × 800.	M
14 <i>Culex pipiens</i> , Gnat, head, male.	M	44 <i>Trypanosoma lewisi</i> , in rat's blood.	M
15 <i>Culex pipiens</i> , Gnat, head, female.	M	45 <i>Tabanus bovinus</i> , Gad Fly.	P
16 Heads of <i>Culex</i> and <i>Anopheles</i> , for comparison.	M	46 <i>Tabanus bovinus</i> , mouth organs.	M
17 <i>Theohaldia annulata</i> , male, × 3.	M	47 <i>Gastrophilus equi</i> , horse bot fly.	P
18 <i>Theohaldia annulata</i> , female, × 3.	M	48 <i>Phlebotomus</i> , larva.	M
19 <i>Ochierotatus annulipes</i> , female, × 2½.	M		
20 <i>Culicella morsitans</i> , egg.	M		

**Section AA 15—HYMENOPTERA.**

Plain Slides 1/3 each, Coloured, where suitable, 3/- each.

(For Hive Bee see Section AA 16, for Ants see Section AA 17.)

**MYMARIDÆ ("Fairly Flies").**

1 <i>Mymar pulchellus</i> , male	M	31 <i>Vespa sylvestris</i> , Queen and embryo nests	P
2 <i>Mymar pulchellus</i> , female	M	32 Wings of Wasp, × 11	M
3 <i>Anagrus incarnatus</i> , male	M	33 Leg of Wasp, × 10	M
4 <i>Anagrus incarnatus</i> , female	M	34 Sting and Poison sac of Wasp, × 14	M
5 <i>Anaphes</i> , male	M	35 Hornet, <i>Vespa crabro</i>	P
6 <i>Anaphes</i> , female	M	36 Hornet, <i>Vespa crabro</i> dissected	M
7 <i>Alaptus minimus</i> , female	M	37 Hornet, <i>Vespa crabro</i> sting and poison sac	M
8 <i>Litus cynipseus</i>	M	38 <i>Pelopaea</i> sp., from Peru, on clay nest	P
9 <i>Cosmocoma</i> , male	M	39 <i>Ammophila sabulosa</i> , Fossa Wasp, male and female	P
10 <i>Cosmocoma</i> , female	M	40 <i>Odynerus</i> sp., Mason Wasp, male and female	P

**WASPS.**

16 <i>Vespa germanica</i> , nest dug out by Badger	P	41 <i>Odynerus</i> , Nest of Mason Wasp	P
17 <i>Vespa norvegica</i> , nest	P	42 Mason Wasp and Nest	D
18 <i>Vespa norvegica</i> , nest in section	P		
19 <i>Vespa vulgaris</i> , Queen	P	<b>GEEES (other than Hive Bees).</b>	
20 <i>Vespa vulgaris</i> , side view of combs	P	52 <i>Bombus</i> sp., life history stages	P
21 <i>Vespa vulgaris</i> , comb from above	P	53 <i>Bombus</i> sp., carrying bee bread	P
22 <i>Vespa vulgaris</i> , comb from below	P	54 <i>Bombus hortorum</i> , nest exposed	P
23 <i>Vespa vulgaris</i> , back of comb	P	55 <i>Andrena fulva</i> , Solitary Bee, male and female	P
24 <i>Vespa vulgaris</i> , comb with brood	P	56 Solitary Bee, group of burrows	P
25 <i>Vespa vulgaris</i> , shell of nest outside	P	57 Solitary Bee, burrow enlarged	P
26 <i>Vespa vulgaris</i> , shell of nest inside	P	58 Violet Carpenter Bee, with nest	D
27 <i>Vespa vulgaris</i> , section of nest shell	P	59 Mason Bee, with nests in snail shell	P
28 <i>Vespa sylvestris</i> , worker, male and female	P	60 Mason Bee, larval cells in section snail shell	P
29 <i>Vespa sylvestris</i> , nest in heather	P	61 Bees nest from Bolivia	P
30 <i>Vespa sylvestris</i> , nest showing comb	P		

**Section AA 16—BEES AND BEE KEEPING.**

The photomicrographs are principally from our own preparations and the photographs (Maghul Apiary) were taken by us specially for Lantern Slides.

For microscopical preparations see Catalogue "A."

Plain Slides 1/3 each. Coloured Slides 3/- each.

**STRUCTURE OF HIVE BEE.**

1 Queen Drone and Worker Bees	P	6 Queen bee, mouth parts	M
2 Egg	M	6 Queen bee, ovaries, × 4	M
3 Queen bee, from above	P	7 Queen bee, T.S. abdomen, × 14	M
4 Queen bee, side view	P	8 Queen Bee, sting and poison sac.	M
		9 Worker bee, from above, × 1½	P

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section L.S.—Longitudinal Section.



**Section AA 16—Bees and Bee Keeping—Continued.**

10 Worker bee, underside	P	53 Near view of frame, with worker bees, etc.	
11 Worker bee, anatomy (external)	M	54 Swarm of bees in branch of tree	
12 Worker bee, anatomy, dissected, from above	D	55 Swarm of bees 18 inches long	
13 Worker bee, head entire	M	56 Bee's nest in hedge	
14 Worker bee, section of head and eyes	M	57 Group of dome-topped straw skeps	
15 Worker bee, mouth parts	M	58 Straw skep, with super of sections	
16 Worker bee, tongue, x 50	M	59 Straw skep, with super of roof on ground	
17 Worker bee, tip of tongue enlarged	M	60 Hiving a swarm, rough-and-ready way	
18 Worker bee, foreleg showing antenna and comb	M	61 Hiving a swarm, rough-and-ready way, nearer view	
19 Worker bee, hind leg and pollen basket	M	62 Transferring swarm from tree to straw skip	
20 Worker bee, basket full of pollen	M	63 W.B.C. hive prepared for hiving a swarm	
21 Worker bee, wax scales on under side	M	64 Hiving a swarm, correct method, watching to see Queen go in	
22 Worker bee, spiracles, x 60	M	65 Driving bees from skip to save them from sulphur	
23 Worker bee, wing showing hooks	M	66 Preparing to "smoke" bees	
24 Worker bee, sting and poison sac	M	67 "Smoking" bees, first operation	
25 Drone, from above	P	68 Driving bees back into straw skip	
26 Drone, V.S., head showing eyes	M	69 Group of "smokers"	
27 Drone, wings unhooked, x 2½	M	70 Group of hives using carbolic cloths	
28 Drone, male organs, x 4½	M	71 Manchester hive, single walled, showing sections	
29 Drone, spermatozoa	M	72 Manchester hive, single walled, with one super	
<b>BEE DISEASES.</b>			
30 Pseudogena carbonaria, parasite in bee hive (rare)	P	73 Manchester hive, single walled, extracting super	
31 Bee Louse, Braula cæca	P	74 W.B.C. hive, showing various parts	
32 Bacterial diseases of Bees	D	75 W.B.C. hive, with supers	
33 Diseased comb, with Foul Brood	D	76 W.B.C. hive, with three supers	
33a Bacillus alvei and B. Pluton	M	77 W.B.C. hive, with Canadian feeder	
34 Tarsonemus woodi, isolated (Isle of Wight disease)	M	78 W.B.C. hive, with stimulating feeder and "eke" for winter	
35 Trachea, infested with T. woodi	M	79 W.B.C. hive and ordinary crate of sections	
36 Trachea, normal	M	80 Nucleus hive, with felt-lined roof and swarm box	
37 Nosema disease, section of chyle stomach with spores, x 300	M	81 Three-framed "observatory" hive.	
38 Wax Moth, cocoons in comb	P	82 Hand foundation mill.	
39 Wax Moth, male and female	P	83 Group wiring material.	
<b>BEE KEEPING.</b>			
45 General view of an apiary		84 Frame of wired foundation.	
46 Another view of an apiary		85 Extracting honey, uncapped comb	
47 Structure of honeycomb		86 Uncapping knives and wax moulds.	
48 Brood cells of honeycomb		88 Honey extractor and cage.	
49 Piece of Honeycomb, top view		88 Honey ripener and strainer.	
50 Conventional designs in honeycomb		89 Wax extractor.	
51 Honeycomb, Queen Drone and Worker cells, near view		90 Queen excluder.	
52 Beekeeper holding frames with worker bees, queen and capped		91 Queen rearing apparatus.	

**Section AA 17—ANTS AND TERMITES.**

Plain Slides 1/3 each.

1 Section of an ant's nest.	D	10 Ground Termite's nest.	P
2 Formica rufa, worker.	P	11 Block of timber destroyed by Termites, side view.	P
3 Formica fusca, winged form.	P	12 Block of timber destroyed by Termites, end view.	P
4 Parasol ant.	P	13 Termite, worker and soldier.	P
5 Leaf-cutting ant from Amazon, Acodoma cephalotes.	P	14 Termite, female.	P
6 Acacia sphaerocephala, ant sheltering plant.	D	15 Ant Lion, larva.	P
7 Cecropia odenopus, ant sheltering plant.	D	16 Ant Lion, larva, head and jaws.	M
8 Cecropia odenopus, nodes enlarged.	D	17 Microdon larva, from ant's nest, x 3.	M
9 Tree Termite's nest.	P		

**Section AA 18—ANIMAL PARASITES (Internal and External)**

Mostly photomicrographs from our own preparations.

Plain Slides 1/3 each.

<b>TICKS AND MITES.</b>			
1 Ixodes ricinus, Sheep Tick, Larva.	M	5 Rhipicephalus evertsi, eggs, x 20, African blood-sucking tick.	M
2 Ixodes ricinus, nymph	M	6 Rhipicephalus evertsi, Larva, x 40, African blood-sucking tick.	M
3 Ixodes ricinus, male	M		
4 Ixodes ricinus, female	M		

Slides Toned to an Artistic Brown Shade cost 6d. each, or 4/6 per dozen extra.

Section AA 18—Animal Parasites (Internal and External)—Continued.

7	<i>Rhipicephalus boophilus</i> , Engorged Female, African blood-sucking tick.	M
8	<i>Rhipicephalus sanguineus</i> , Tick of man and dog (conveys <i>Protoplasmosis</i> ), nymph	M
9	<i>Rhipicephalus sanguineus</i> , Tick of man and dog (conveys <i>Protoplasmosis</i> ), female.	M
10	<i>Ornithodoros savignyi</i> , Tick of camel and man.	M
11	<i>Amblyomma splendidum</i> , Buffalo Tick.	M
12	<i>Sarcoptes scabiei</i> , Itch Mite, Human, male and female.	M
13	<i>Prosopites equi</i> from Horse, male and female.	M
14	Pentastomum, from liver of sheep.	M
15	<i>Demodex folliculorum</i> , "Face Insect."	M
16	<i>Gnemadoxoptes mutans</i> , "Scaly Leg" of fowl.	M
17	<i>Tarsonemus woodi</i> , Bee Parasite, male and female.	M
18	<i>Tarsonemus woodi</i> , in situ in Bee's Trachea.	M
<b>LICE.</b>		
29	<i>Trinoton conspurcatorum</i> , Bird Louse.	M
31	<i>Menopon pallidum</i> , from Fowl.	M
32	<i>Menopon perdicis</i> , eggs on Partridge feather, x 30.	M
33	<i>Lipeurus laculus</i> , from Pigeon.	M
34	<i>Lipeurus staphylinoides</i> from Gannet, x 20.	M
35	<i>Goniodes dissimilis</i> , male, from Fowl, x 28	M
36	<i>Pediculus capitis</i> , Head Louse, male, x 25.	M
37	<i>Pediculus capitis</i> , Head Louse, female, x 25	M
38	<i>Pediculus capitis</i> , Head Louse, Egg in Hair.	M
39	<i>Pediculus vestimenti</i> , Body Louse, male, x 25.	M
40	<i>Pediculus vestimenti</i> , Body Louse, female, x 25.	M
41	<i>Phthirus pubis</i> , Crab Louse, male, x 28.	M
42	<i>Phthirus pubis</i> , Crab Louse, female, x 25.	M
43	<i>Hæmatopinus suis</i> , from Pig, female.	M
44	<i>Hæmatopinus eurysternus</i> , from Cow, female.	M
<b>FLEAS.</b>		
55	<i>Pulex irritans</i> , Human Flea, male.	M
56	<i>Pulex irritans</i> , Human Flea, female.	M
57	<i>Pulex irritans</i> , Human Flea, larva.	M
58	<i>Xenopsylla cheopis</i> , Plague Flea, male.	M
59	<i>Xenopsylla cheopis</i> , Plague Flea, female.	M
60	<i>Leptopsylla musculi</i> from Mouse, male.	M
61	<i>Ceratophyllus gallinae</i> , Hen Flea, male, x 15.	M
62	<i>Ceratophyllus gallinae</i> , Hen Flea, female, x 15.	M
63	<i>Ceratophyllus gallinae</i> , Hen Flea, Pupa, x 15.	M
64	<i>Palaopsylla minor</i> , from Mole, male, x 20.	M
65	<i>Palaopsylla minor</i> , from Mole, female, x 20.	M
66	<i>Ischnopsyllus hexacanthus</i> , from Bat.	M
67	Jigger, from Congo, mouth organs.	M
68	<i>Ctenophthalmis felis</i> , Cat Flea, x.	M
69	<i>Ctenophthalmis felis</i> , Cat Flea, larva x 11.	M
70	<i>Ctenophthalmis felis</i> , Cat Flea, pupa in cocoon, x 11.	M
<b>DIPTERA.</b>		
81	<i>Melophagus ovinus</i> , Sheep Ked, male.	M
82	<i>Melophagus ovinus</i> , Sheep Ked, female.	M
83	<i>Nycteribia hopeni</i> , from Flying Fox, x 6.	M
84	<i>Stenopteryx hirundinus</i> , from Swallow, x 3.	M
85	<i>Braula cæca</i> , from Bee.	M
86	<i>Hypoderma bovis</i> , Cattle Bot Fly, male and female.	P
87	<i>Hypoderma bovis</i> , Cattle Bot Fly, egg on hair.	P
88	<i>Hypoderma bovis</i> , Cattle Bot Fly, larva.	P
89	<i>Hypoderma bovis</i> , Cattle Bot Fly, pupa.	P
<b>TREMATODES.</b>		
100	<i>Fasciola hepatica</i> , Liver Fluke, eggs.	M
101	<i>Fasciola hepatica</i> , Liver Fluke, Miracidium.	M
102	<i>Fasciola hepatica</i> , Liver Fluke, Redia.	M
103	<i>Fasciola hepatica</i> , Liver Fluke, Cercaria.	M
104	<i>Fasciola hepatica</i> , Liver Fluke, Encysted.	M
105	<i>Fasciola hepatica</i> , Liver Fluke, Mature.	M
106	<i>Distomum lanceolatum</i> , from Sheep, x 8.	M
<b>CESTODES.</b>		
112	<i>Tænia solium</i> , Tape worm.	P
113	<i>Tænia solium</i> , Tape Worm, head, x 25	M
114	<i>Cœnurus cerebralis</i> , Staggers of Sheep.	P
115	<i>Nematotænia dispar</i> , from Frog, x 75.	M
116	<i>Solenophorus</i> , from Python.	M
117	<i>Rehinococcus veterinorum</i> , from Sheep, x 100.	M
118	<i>Schistocephalus</i> , from Stickleback.	M
119	Stickleback, infested with <i>Schistocephalus</i> .	P
120	<i>Davainea proglottina</i> , from Fowl, x 22.	M
<b>NEMATODES.</b>		
126	<i>Filaria loa</i> in Human Blood.	M
127	<i>Filaria sanguinis hominis</i> , Night	D
128	<i>Filaria sanguinis hominis</i> , Day.	D
129	<i>Syngamus trachealis</i> , Gape Worm, in Windpipe.	P
130	<i>Trichina spiralis</i> , in Muscle, x 40.	M
131	<i>Hætarakis vesicularis</i> , from Fowl, male, x 8.	M
132	<i>Hætarakis vesicularis</i> , from Fowl, female, x 8.	M
133	<i>Tricocephalus dispar</i> .	M
134	<i>Strongyloides stercoralis</i> , from Sheep, male and female.	M
135	<i>Echinorhynchus gigas</i> , from Pig.	P
136	<i>Echinorhynchus proteus</i> , from Fish, x 8.	M
<b>CRUSTACEA.</b>		
144	<i>Argulus foliaceus</i> , Fish Parasite.	M

Section AA 19—SOME DOMESTIC PESTS.

Plain Slides only, 1/3 each.

1	Cockroach, <i>Periplaneta orientalis</i> , walking.	P	7	Furniture Beetle, larva and pupa in burrows.	P
2	Cockroach, underside.	P	8	Furniture Beetle, male and female.	P
3	Cockroach, side view.	P	9	Brachonid parasite of Furniture Beetle.	M
4	Cockroach, mouth organs.	P	10	Wood borer, <i>Xestobium tessellatum</i> .	P
5	House Cricket, <i>Gryllus domesticus</i> .	P	11	<i>Xestobium</i> galleries in timber (Westminster Hall).	P
6	Furniture Beetle, <i>Anobium domesticum</i> , larva.	P	12	<i>Ptinus tectus</i> , male and female.	P

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

Section AA 19—Some Domestic Pests—Continued.

13	<i>Ptinus tectus</i> , pupa cases of ground rice.	P	20	Common Flea, male.	M
14	<i>Ptinus fur</i> , Drug Beetle.	P	21	Common Flea, female.	M
15	<i>Sitodrepa panicea</i> (found in drugs, etc.).	P	22	Common Flea, larva.	M
16	<i>Niptus hololeucus</i> .	P	23	House Bug, female.	M
17	Cheese Mite.	M	24	House Bug, showing mouth organs, female.	M
18	Cheese Fly.	P	25	Furniture Mite.	M
19	Meal Mite.	M			

Section AA 20—HORTICULTURAL AND AGRICULTURAL PESTS and a few "Friends" marked F in italics.

(For Fungous Diseases of Plants see Section BB 6.)

A new series of photographs, principally from life, which will be added to from time to time. Plain Slides 1/6 each. Coloured, where suitable, 3/- each.

MITES, etc.

1	Big Bud on black currant branches.	P
2	Big Bud Section, with <i>Eriophyes</i> ribs in situ, x 6.	M
3	Black Currant Mite, <i>Eriophyes</i> ribs.	D
4	Pear Leaf curled by <i>Eriophyes</i> pyri.	P
5	Red Leaf, underside, with <i>E. pyri</i> , x 20.	M
6	Ear Spider on young currant bushes.	P

MYRIOPODA.

7	<i>Milipele</i> , <i>Julus</i> sp., damages many vegetables, including potatoes.	P
8	<i>Centipede</i> , <i>Lithobius</i> , feeds on eggs, larvæ and insects of various kinds—F.	P
9	<i>Centipede</i> , <i>Geophilus</i> sp., feeds on eggs, larvæ, and insects of various kinds—F.	P

ORTHOPTERA.

10	Earwig, <i>Forficula auricularia</i> , spoils Dahlia flowers.	P
11	Thrips, <i>Ceratothrips dracænae</i> , with wings extended, x 20.	M

HEMIPTERA—Homoptera.

12	Cuckoo Sp. on beather	P
13	<i>Psylla aini</i> and <i>fosteri</i> on alder leaves.	P
14	<i>Psylla mali</i> , ova on fruit spur.	P
15	<i>Psylla mali</i> , larva on apple leaf.	P
16	<i>Psylla mali</i> , nymph on apple leaf.	P
17	<i>Psylla mali</i> , adults on apple leaf.	P
18	<i>Typhlocyba</i> , on apple.	M

APHIDÆ—"Greenfly."

19	Aphis on Sweet Pea, <i>Macrosiphum pis.</i>	P
20	Aphis, enlarged, sucking juices of Sweet Pea.	P
21	Aphis from Potato, apterous form enlarged	M
22	Plum Shoot leaves curled by Aphids.	P
23	Plum Leaf with Aphids in situ.	P
24	Aphids on plum twig.	P
25	Aphids migrating down branches of Plum Tree.	P
26	Aphis, curled Elm leaves.	P
27	<i>Idopterus nephrolepidis</i> from Fern, winged and apterous form, x 9.	M
28	Orchid stem, with <i>Ceratophis lanænae</i> , x 2½	M
29	Aphids on Rose Buds, with <i>Syrphus</i> larvæ.	P
30	Woolly Aphis, <i>Schizoneura lanigera</i> on Apple hole.	P
31	Woolly Aphis, <i>Schizoneura</i> on Apple branches.	P

ALEURODIDÆ—Snowflies.

32	Snowfly, <i>Aleurodes vaporariorum</i> on <i>Pelargonium</i> x 11.	M
33	Snowfly, <i>Aleurodes proletella</i> , Ova and Larvæ on Cabbage, x 11.	M
34	<i>Acletoxenus syrphoides</i> , Pupæ, x 6½.	M
35	<i>Acletoxenus syrphoides</i> , Imago, male and female, x 5.	M

COCCIDÆ—Scale Insects.

36	<i>Chionaspis salicis</i> , Scales on Alder.	F
37	<i>Chionaspis salicis</i> , Scale insect, female.	M
38	<i>Cryptococcus</i> on Beech bole.	P
39	Mussel Scale, <i>Mytilaspis</i> on Apple twig.	P
40	Scale insects from Bananas.	M
41	Lacewing Fly, <i>Chrysopa</i> sp., also stalked eggs of same—F	P

LEPIDOPTERA—Butterflies and Moths.

42	Cabbage White <i>Pieris brassicæ</i> , Metamorphosis.	P
43	Parasite of Cabbage White, <i>Microgaster glomeratus</i> , male and female, x F.	M
44	Parasite of Cabbage White, <i>Coccyzus</i> , x 2½, F.	M
45	Hyperparasite on <i>Microgaster</i> , x 4.	M
46	Cabbage Moth, <i>Mamestra brassicæ</i> , Metamorphosis (case).	P
47	Cabbage Moth, <i>Mamestra brassicæ</i> , larva P	
48	Green Apple Pug, light variety on branch P	
49	Green Apple Pug, dark variety on branch P	
50	<i>Tortrix roseana</i> , with Pupa case on Pear leaf P	
51	Currant Moth, <i>Abraxis grossulariata</i> , metamorphosis (case). P	
52	Mottled Umber, <i>H. defoliaria</i> amongst oak leaves. P	
53	Mottled Umber, <i>H. defoliaria</i> , apterous female at rest. P	
54	Lackey Moth, <i>B. neustria</i> , metamorphosis. P	
55	Lackey Moth, <i>B. neustria</i> , larvæ and damage done by same. P	
56	Codlin Moth, <i>Carpocapsa pomonella</i> on apple. P	
57	Codlin Moth, <i>Carpocapsa pomonella</i> , imago P	
58	Winter Moth, <i>C. Brumata</i> and December Moth, <i>P. popul.</i> P	

COLEOPTERA—Beetles.

59	Cockchafer, <i>Melolontha vulgaris</i> , larva. P
60	Cockchafer, <i>Melolontha vulgaris</i> , pupa. P
61	Cockchafer, <i>Melolontha vulgaris</i> , metamorphosis (case). P
62	Cockchafer, with wings outstretched. P
63	Cockchafer, antennæ of male and female. M
64	Ground Beetle, larva, with parasitic <i>Proctotrypid</i> larvæ in situ—F. P
65	<i>Proctotrypid</i> Flies, from larva of Ground Beetle—F. P
66	Wire Worms (Larvæ) and Skipjacks (beetles) P
67	Skipjack Beetle, <i>Elater</i> sp. (enlarged). P
68	Ladybird <i>Coccinella septempunctata</i> . F P
69	Ladybird <i>Coccinella septempunctata</i> , larva. F P
70	Ladybird <i>Coccinella</i> pupa and pupa case. F P
71	Ladybird <i>Coccinella</i> , with aphids. F P

Lecture Lanterns in various patterns—See Catalogue F.

**Section AA 20—Horticultural and Agricultural Pests—Continued.**

74 Tiger Beetle, <i>Cicindela campestris</i> , × 1½.	F M	99 Frit Flies, <i>Ocinis frit</i> , pupa, male and female, × 11.	M
75 Tiger Beetle, <i>Cicindela campestris</i> , larva.	F M	100 Field of Oats damaged by Frit Fly.	P
76 Tiger Beetle, larvæ in burrows.	F P	101 Oats damaged by Frit Fly nearer view.	P
77 Carabus.	F P	102 Narcissus Fly, <i>Merodon equestris</i> .	P
78 Colorado Beetle, <i>Doryphora decemlineata</i> .	P	103 Narcissus Fly, larva in situ, section of bulb.	P
79 Pine Weevil, <i>Pissodes pini</i> , beetle and larva in situ.	P	104 Narcissus Fly, <i>Merodon equestris</i> , pupa.	P
<b>DIPTERA.</b>			
77 Leather Jacket, larva of Crane Fly, <i>Tipula</i> sp.	P	105 Small Narcissus Fly, <i>Eumerus tuberculatus</i> , male and female.	M
78 Crane Fly, pupa, <i>Tipula</i> sp.	P	106 Small Narcissus Fly, pupa, × 3½	
79 Crane Fly, <i>Tipula paludosa</i> resting on Gooseberry bush.	P	107 Chrysanthemum Fly, leaf attacked by larvæ of.	P
80 Crane Fly, <i>Tipula paludosa</i> , resting on pine trunk.	P	108 Chrysanthemum Fly, male and female.	M
81 Crane Fly, <i>Tipula</i> sp., resting, near view.	P	<b>HYMENOPTERA—Sawflies, Parasites, Etc.</b>	
82 Hessian Fly, <i>Cecidomyia destructor</i> , × 7.	M	(For Bees and Wasps see other Sections.)	
83 Hessian Fly, larva in barley, stem. Drawing by F. Enock.	D	109 Gooseberry Sawfly, <i>Nematus ribesii</i> , male and female.	P
84 <i>Asphondylia ulicis</i> pupa in galls on Furze, × 2½ (closely allied to Hessian Fly).	M	110 Gooseberry Sawfly, <i>Nematus ribesii</i> eggs on leaf.	M
85 <i>Asphondylia ulicis</i> from Furze, male and female, × 3½.	M	111 Gooseberry Sawfly, red currant leaf with young larvæ.	P
86 Cabbage Plants, with galls of <i>Centhorhynchus pleurostyma</i> .	P	112 Gooseberry Sawfly, red currant leaf with full grown larvæ.	P
87 Section of Gall of <i>Centhorhynchus</i> , larvæ in situ.	P	113 Larch Sawfly, <i>Nematus erichsonii</i> , × 1½.	M
88 Kidney Bean Fly, <i>Chortophila striolata</i> , m. × 5.	M	114 Larch Sawfly, <i>Nematus erichsonii</i> , larvæ.	P
89 Kidney Bean Fly, <i>Chortophila striolata</i> , pupa.	M	115 Larch Sawfly, <i>Nematus erichsonii</i> , pupæ.	P
90 Ichneumon, Parasite of <i>Chortophila striolata</i> .	F M	116 Larch Shoots injured by <i>Nematus erichsonii</i> .	P
91 Ichneumon Fly, <i>Ophion obscurus</i> .	F P	117 Parasite on Larch Sawfly, <i>Mesolius ulicis</i> , × 25.	F M
92 Hover Flies, various species of <i>Syrphus</i> , resting on white poppy.	F P	118 Parasite on Larch Sawfly, <i>Zenillia pexops</i> ×.	F M
93 Hover Fly, <i>Syrphus pyrastris</i> , × 2.	F M	119 <i>Nematus erichsonii</i> , <i>Mesolius</i> , male, <i>Zenillia pexops</i> , female.	P
94 Hover Fly, <i>Syrphus</i> sp., larva with aphids on rose.	F P	120 Cocoon of <i>N. erichsonii</i> infested with <i>Cordiceps</i> , × 1½.	F M
95 Onion Fly, <i>Phorbia cepetoxium</i> , male and female.	M	121 Sawfly, <i>Trichosoma lucorum</i> , and cocoon.	P
96 Onion Fly, pupa, upper and under sides.	M	122 Hornet Sawfly, <i>Sirex gigas</i> , male and female.	P
97 Onion in Section, damage by larva of Onion Fly.	P	123 Hornet Sawfly, <i>Sirex gigas</i> , side view, f.	P
98 Frit Flies, <i>Ocinis frit</i> , male and female, × 7.	M	124 Hornet Sawfly, <i>Sirex gigas</i> , metamorphosis in timber.	P
		125 Hornet Sawfly, <i>Sirex violaceus</i> , male.	M
		126 Hornet Sawfly, <i>Sirex violaceus</i> , female.	P
		127 Timber injured by <i>Sirex violaceus</i> .	P

**Section AA 21—PROTECTIVE RESEMBLANCE and MIMICRY.**

Plain Slides 1/3 each. Coloured, where suitable, 3/- each.

May be had on hire, chiefly coloured, at an increase in price of 1/- dozen over usual hire fee.

**BRITISH.**

- 1 Larva of Brimstone Butterfly on *Rhamnus*.
- 2 Larva of Brimstone Butterfly (larger) on *Rhamnus*.
- 3 Pupa of Brimstone Butterfly on *Rhamnus*, resembles leaf.
- 4 Group of Stick Caterpillars.
- 5 Larvæ, Scalloped Hazel Moth, on twig.
- 6 Pine Beauty, larvæ on Pine.
- 7 Brussels Lace, larva on Lichen.
- 8 Pale Tussock Moth on twig.
- 9 Large Carpet, larva on Rose.
- 10 Shaded Broad Bar Moth, larvæ on Pine twig.
- 11 Shaded Broad Bar Moth, larvæ on bark.
- 12 Beech Green Carpet Moth, on lichen-covered wall.
- 13 Larvæ of Large Emerald Moth on Birch.
- 14 Lime Hawk, larvæ resting along prominent ribs on underside of leaf.

- 15 Grey Knot Moth on bark.
- 16 Great Oak Beauty, larva on twig.
- 17 Ring Carpet Moth on bark.
- 18 Sycamore Tussock Moth on bark.
- 19 Mottled Beauty Moth on bark.
- 20 Angle-shades Moth on twig.
- 21 Early Grey Moth on bark.
- 22 Pass Moth, larva on Poplar.
- 23 Pass Moth, larva on Poplar, another view.
- 24 Pass Moth, cocoons on bark.
- 25 Buff Tip Moth on twigs.
- 26 Privet Hawk at rest on bark.
- 27 Privet Hawk on bark and in flight.
- 28 Yellow Underwing, on dead leaves.
- 29 Marvellie du Jour (Aprilina) on Lichen and in flight.
- 30 Scarce Marvellie du Jour (Orion) on Lichen-covered bark.
- 31 Red Underwing on bark and in flight.
- 32 Lappet Moth on dead leaves.

All Slides may be had Plain—unless otherwise stated.  
 P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section  
 L.S.—Longitudinal Section.

Section AA 21—Protective Resemblance and Mimicry—Continued

- |                                                                                 |                                         |
|---------------------------------------------------------------------------------|-----------------------------------------|
| 33 Peppered Moth on bark, light and dark varieties.                             |                                         |
| 34 Various Moths on leaves.                                                     |                                         |
| 35 Hornet, male and female.                                                     |                                         |
| 36 Hornet, Clearwing and Wasps, male and female.                                |                                         |
| 37 British Clearwing Moths, group.                                              |                                         |
| 38 Belted Sawfly, <i>sirex gigas</i> .                                          |                                         |
| 39 Crane Fly, <i>Tipula confusa</i> , on Pine trunk.                            |                                         |
| 40 Crane Fly, <i>Tipula confusa</i> , on rough board (unsuitable surroundings). |                                         |
| 41 Crane Fly, <i>Tipula lutescens</i> , resting amongst grasses.                |                                         |
| 42 Wasp and Dipterous Fly ( <i>V. germanica</i> and <i>Syrphus laniger</i> ).   |                                         |
| 43 Bumble Bee and two Dipterous mimics.                                         |                                         |
| 44 Cocoons of Weevil on Figwort.                                                |                                         |
| 45 <i>Cornus scrophularia</i> , Figwort Weevil.                                 |                                         |
| 46 Spider Crab, <i>Pisa gibbsii</i> , with Seaweed.                             |                                         |
| 47 Crab hiding between stones.                                                  |                                         |
| 48 Plaice on sand.                                                              |                                         |
| 49 Eggs of Tern on beach.                                                       |                                         |
| 50 Eggs of Ringed Plover among stones.                                          | } 1/6 each plain.<br>3/6 each coloured. |
| 51 Snipe among grass.                                                           |                                         |
| 52 Pheasant on nest.                                                            |                                         |
| 53 Nightjar amongst bracken.                                                    |                                         |
| 54 Leveret in stable.                                                           |                                         |
- 
- FOREIGN INSECTS.**
- |                                                                           |  |
|---------------------------------------------------------------------------|--|
| 57 Stick and Leaf Insects, various.                                       |  |
| 58 Stick and Leaf Insects, African.                                       |  |
| 59 Eggs of Leaf Insect, <i>Pulchriphylum cruriforme</i> (resemble seeds). |  |
| 70 Leaf Insect, <i>Phyllium</i> sp.                                       |  |
| 71 Leaf Insect, <i>Phyllium</i> , resting attitude.                       |  |
| 72 Leaf Insect, <i>Bacillus Rossi</i> (Stick Insect), Eggs.               |  |
| 73 Leaf Insect, <i>Bacillus Rossi</i> , male and female on Privet.        |  |
- 
- |                                                                    |  |
|--------------------------------------------------------------------|--|
| 74 Leaf Insect, <i>Bacillus Rossi</i> , large group.               |  |
| 75 Leaf Insect, Group of various "Walking Sticks."                 |  |
| 76 Leaf Insect, Mantis, praying attitude.                          |  |
| 77 Mantis, wings expanded.                                         |  |
| 78 Mantis sp.                                                      |  |
| 79 Mantis sp., wings expanded.                                     |  |
| 80 Mantis sp., S. Leone, leaf-like legs.                           |  |
| 81 Mantis sp., with small wings expanded.                          |  |
| 82 Collection of <i>Trassitta</i> , Mantids, Locusts.              |  |
| 83 <i>Empusa gangyloides</i> , among twigs.                        |  |
| 84 <i>Empusa gangyloides</i> , side view.                          |  |
| 85 <i>Lithinus microcristatus</i> , insect on lichen-covered bark. |  |
| 86 <i>Lithinus nigrocristatus</i> , insect removed from bark.      |  |
| 87 <i>Oleandrus nerioifolius</i> , Green Leaf Insect.              |  |
| 88 Locusts on grass and flying.                                    |  |
| 89 <i>Fragalis nasuta</i> (Locust) flying.                         |  |
| 90 Locust, wings open and closed.                                  |  |
| 91 Green-winged Locust, flying.                                    |  |
| 92 Green Grasshopper on leaves.                                    |  |
| 93 Green Leaf Insect, wings extended.                              |  |
| 94 <i>Panchlora viridis</i> , on leaves.                           |  |
| 95 Fly living in bee's nest.                                       |  |
| 96 <i>Eurybrachys</i> sp., on bark and flying.                     |  |
| 97 <i>Eurybrachys westwoodii</i> , on bark and flying.             |  |
| 98 <i>Charagia daphanoides</i> , on bark and flying.               |  |
| 99 <i>Papilio merope</i> , imitating grass.                        |  |
| 100 <i>Kallima inachis</i> , closed with leaf.                     |  |
| 101 <i>Kallima inachis</i> , upper and under, male and female.     |  |
| 102 <i>Kallima</i> , group, upper side.                            |  |
| 103 <i>Kallima</i> , group, under side.                            |  |
| 104 <i>Salamis anacardi</i> , under side.                          |  |
| 105 <i>Salamis cytora</i> , upper side.                            |  |
| 106 Group, uppersides moths, undersides butterflies.               |  |
| 107 <i>Acanthopsyche tristis</i> , larva case, S. Africa.          |  |

Section AA 22—MOLLUSCA.

Chiefly from photographs. Plain Slides 1/3 each. Coloured, where suitable, 3/6 each.

**CEPHALOPODA.**

- |                                                           |   |
|-----------------------------------------------------------|---|
| 1 <i>Argonauta argo</i> , Paper Nautilus, showing animal. | P |
| 2 <i>Argonauta argo</i> , Paper Nautilus, showing animal. | P |
| 3 <i>Nautilus pompilius</i> , shell, entire.              | P |
| 4 <i>Nautilus</i> , section of shell.                     | P |
| 5 <i>Chroteuthis veranyi</i> , Squid.                     | P |
| 6 <i>Loligo vulgaris</i> , egg masses.                    | D |
| 7 <i>Loligo vulgaris</i> , young.                         | M |
| 8 <i>Loligo marmorata</i> , adult.                        | P |
| 9 <i>Octopus vulgaris</i> .                               | M |
| 10 <i>Sepia officinalis</i> , T.S., body.                 | M |
| 11 <i>Sepia officinalis</i> , T.S., arm and sucker.       | M |
| 12 <i>Sepia officinalis</i> , T.S., bone.                 | M |
| 13 <i>Sepia officinalis</i> , <i>Radula</i> .             | M |
| 14 <i>Seplota</i> , sp., V.S., head showing eyes.         | M |

**PTEROPODA, Wing-footed Molluscs.**

- |                                  |   |
|----------------------------------|---|
| 15 <i>Cleodora pyramidalis</i> . | M |
| 16 <i>Crescis acicula</i> , x 9. | M |

**NUDIBRANCHIATA, Naked Molluscs.**

- |                                                                                         |   |
|-----------------------------------------------------------------------------------------|---|
| 17 <i>Eolis</i> sp., x 16.                                                              | M |
| 18 <i>Dendronotus</i> .                                                                 | P |
| 19 <i>Archidoris</i> , <i>Polycera</i> , <i>Eolis</i> , <i>Doto</i> ( <i>British</i> ). | D |
| 20 <i>Aplysia limacina</i> , Sea Hare, young, x 8.                                      | M |
| 21 <i>Aplysia limacina</i> , mature, dissected.                                         | P |
| 22 <i>Phyllirrhoe bucephalum</i> , x 6.                                                 | M |

**GASTEROPODA—British.**

- |                                                       |   |
|-------------------------------------------------------|---|
| 24 <i>Helix aspersa</i> (Garden Snail), from life.    | P |
| 25 <i>Helix pomatia</i> , Edible Snail, from life.    | P |
| 26 <i>Agrion empericorum</i> , Common Slug (variety). | P |
| 27 <i>Limax</i> sp., various slugs.                   | P |
| 28 <i>Limnea stagnalis</i> .                          | P |
| 29 <i>Limnea palustris</i> .                          | P |
| 30 <i>Paludina vivipara</i> , showing operculum.      | P |
| 31 <i>Planorbis cornus</i> .                          | P |
| 32 <i>Planorbis spirorbis</i> .                       | P |
| 33 Eggs of whelk ( <i>Nassa</i> ).                    | P |
| 34 <i>Chiton</i> .                                    | P |
| 35 <i>Patella</i> , limpet.                           | P |
| 36 <i>Halotis</i> .                                   | P |
| 37 <i>Bulimus</i> (Whelk).                            | P |
| 38 <i>Bulimus</i> , internal shell.                   | M |

**EXOTIC SHELLS, from Museum Specimens.**

- |                                                     |   |
|-----------------------------------------------------|---|
| 39 <i>Buñinus oblongus</i> , eggs and young shells. | P |
| 40 <i>Bulimus oblongus</i> , mature.                | P |
| 41 <i>Bulimus vincentinus</i> .                     | P |
| 42 <i>Columna flamma</i> .                          | P |
| 43 <i>Cyclophorus siamensis</i> , under side.       | P |
| 44 <i>Cyclophorus siamensis</i> , upper side.       | P |
| 45 <i>Cyclosoarus mariei</i> .                      | P |
| 46 <i>Cylindrella Trinitaria</i> .                  | P |
| 47 <i>Diplommatina occidentalis</i> .               | P |
| 48 <i>Ennea morletti</i> .                          | P |

Carrying Boxes, with Rubber Packing and Leather Handles—See Cover.

Section AA 22—Mollusca—Continued.

49 Gibbus lyonettianus.	P	101 Ianthina rotundata, Radula.	M
50 Helix labyrinthica.	P	102 Nassa reticulata, Radula.	M
51 Helix quæsitæ.	P	103 Nerita ascensionis, Radula.	M
52 Helix siguifrensis.	P	104 Planorbis cornuus, Radula.	M
53 to 56 Hyalinia sp.	P	105 Pyrazus palustris, Radula.	M
57 Lima hiaus, nest-building mollusc.	P	106 Rhytida greenwoodi, Radula.	M
58-59 Opisthostoma mirabilis and sp.	P	107 Schizoglossa lania, Radula.	M
60 Phenaccharopa novozelandica.	P	108 Trochus lineatus, x 25, Radula.	M
61 Pleurotomaria, showing mode of building up shell.	P	108a Patella vulgata, Radula.	M
62 Schizoglossa novozelandica.	P		
63 Semifusus probosciflorus, egg capsules.	P		
64 Semifusus probosciflorus, egg capsules and embryos.	P		
65 Sowerbiena sp. (Madagascar).	P		
66 Stenogyra octona.	P		
67 Suteria ide.	P		
68 Tapes aureus.	P		
69 Tapes decussatus, variation.	P		
70 Zetus olla.	P		

GENETALIA.

109 Conus striatus, darts.	M
110-111 Hyalinia, Genetalia.	M
112 Helix, darts.	M

DIAGRAMS.

113 Veligers of Gasteropods and Pteropods.	D
114 Eyes of mollusca (various).	D

INDUSTRIAL USES OF SHELLS, ORNAMENTS, ETC.

115 Freshwater pearl mussel and pearls.	P
116 Cameo on shell of Cassis rufa.	P
117 Pearl button manufacture, stages.	P
118 Pearl button manufacture, stages.	P
119 Pearl button manufacturer's label.	P
120 Tridacna shell, source of Polynesian ornaments, etc.	P
121 The Shank, Hindu armllet made from it.	P
122 Ovula tortilis, a native armllet.	P
123 Shell chisels and adzes, Fiji.	P
124 Shell bead armllet, Fiji.	P
125 Wampum belt, N. A. Indian.	P
126 Conus sp., Armllet from.	P
127 Native gorget of "shell money."	P
128 Native head ornament, shell beads.	M
129 Acepaha, Cardium, Tridacna (Hæckel, 55).	D
130 Ctenobranchia, Conus, Murex (Hæckel, 53).	D
131 Nudibranchia, Æolis, Idalia (Hæckel, 43).	D
132 Ammonitida, Ammonites (Hæckel, 44).	D
133 Gamochonia, Octopus (Hæckel, 54).	D

ADDITIONAL SLIDES.

134 Helix pomatia, T.S. hermaphrodite gland, x 90.	M
135 Solen ensis (Razor shell).	P
136 Scalaria communis (Wentle trap).	P
137 Phorus onustus.	P
138 Magilus antignus.	P
139 Patella (limpet) on rock.	P
140 Hyalina excavata.	P
141 Bearded Mussel and Common Mussel (two varieties of latter).	P
142 Patella (Limpet) under side, on glass.	P
143 Common Wheelks (Bulimus) on rock.	P
145 Scrobicularia in situ on beach.	P
146 Limpets, Wheelks, Barnacles, on Fucus-covered rock.	P

PELECYPODA (Lamellibranchiata) MUSSELS.

71 Anodonta cygnea, fresh-water mussel Glochidia, attached to fins of stickleback.	P
72 Anodonta cygnea, from life.	P
73 Anodonta cygnea, dissected to show internal organs.	P
74 Anodonta cygnea, T.S., shell.	M
77 Cardium aculeatum, Cockle, showing animal.	P
78 Pecten sp., scallop shells, group.	P
79 Pecten opercularis, V.S., eye.	M
80 Pinna nobilis.	P
82 Ostrea edulis, Oyster.	M
83 Ostrea edulis, young Oyster.	M
84 Section of a pearl.	M

WOOD AND ROCK BORING SHELLS.

85 Teredo navalis, ship worm, showing animals.	P
86 Teredo navalis, ship worm, borings in oak.	P
87 Teredo norvegica, ship worm, showing animal in tube.	P
88 Pholas dactylus, boring into chalk.	P
89 Pholas dactylus, in its burrow.	P
90 Saxicava rugosa, boring into limestone.	P
91 Gastrochæna truncata, in its bore.	P

RADULÆ (Palates), showing Teeth.

92 Arope cafre, Radula.	M
93 Ampullaria cornu arietis, Radula.	M
94 Bucinum undatum, Radula.	M
95 Calliostoma zizyphimus, Radula.	M
96 Chiton, Radula.	M
97 Cyclotus translucidus, Radula.	M
98 Glandina algira, Radula.	M
99 Haliotis tuberculata, Radula.	M
100 Helix pomatia, Radula.	M

Section AA 23—ECHINODERMATA.

Plain Slides, 1/3 each. Coloured, where suitable, 3/- each.

1 Echinodermata, type slide.	D	10 Brachiolaria larva of starfish, x 40.	M
		11 Asterina gibbosa, 2 larvæ stages.	M
		12 Asterina gibbosa, young.	M
		13 Asterina gibbosa, sections in various planes, x 9.	M
		14 Asterina gibbosa, horizontal section.	M
		15 Asterina sp. exoskeleton.	P
		16 Acanthaster mauritiensis.	P
		17 Amphura squamata, x 9.	M
		18 Asterias glacialis.	P
		19 Asterias glacialis, dark ground.	P

CRINOIDEA (Feather Stars).

3 Antedon rosacea, Pentacrinus.	M
5 Antedon rosacea, Pinna, x 10.	M
6 Antedon rosacea, E.	D
7 Pentacrinus.	D
8 Encrinus.	D

ASTEROIDEA (Starfishes).

9 Bipinnaria larva of starfish, x 75.	M
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"Hæckel," from "Kunst Formen der Natur"—a Collection of Drawings in Colour of Beautiful Natural Objects by the late Ernst. Hæckel.

## Section AA 23—Echinodermata—Continued.

20 <i>Asterias ochracea</i> .	P	62 <i>Spatangus purpureus</i> (sand urchin).	P
22 <i>Astronyx loveni</i> .	P	63 <i>Spatangus</i> sp., (sand urchin).	P
23 <i>Crossaster papposus</i> .	P	64 <i>Spatangus</i> in its burrow.	D
25 <i>Gorgonocephalus verucosus</i> .	P	65 <i>Pluteus</i> of various echinus.	D
26 <i>Hippasterina plana</i> .	P	66 <i>Pluteus</i> , 2 views.	D
28 <i>Pentaceros reticulatus</i> .	P	67 <i>Pluteus</i> , 3 stages.	D
29 <i>Ophiocoma</i> sp.	P	68 <i>Auricularia</i> , 2 views.	D
31 <i>Ophiothrix fragilis</i> , young.	P	69 <i>Auricularia</i> , 3 stages.	D
32 <i>Ophiura albida</i> , metamorphopsis stage.	M	70 <i>Auricularia</i> and <i>Bipinnaria</i> .	D
33 <i>Tethyaster subinermis</i> .	P		
34 Group of starfishes.	D		
<b>ECHINOIDEA (Sea Urchins).</b>			
35 <i>Echinus esculenta</i> ova, × 40.	M	<b>HOLOTHUROIDEA (Sea Cucumbers).</b>	D
36 <i>Echinus</i> sp. <i>pluteus</i> , × 40.	M	71 <i>Auricularia</i> larva of Holothurian.	M
37 <i>Echinus</i> sp. advanced <i>pluteus</i> .	M	72 <i>Auricularia</i> larva of <i>Synapta</i> .	D
39 <i>Echinus</i> sp., metamorphopsis stage.	M	73 Dissection of a Holothurian.	M
40 <i>Echinus</i> sp., young, dark-ground.	M	74 <i>Phylloporus urna</i> , 4 larval forms.	M
41 <i>Echinus</i> sp., young, dark ground, E, × 20.	M	75 <i>Synapta inhærens</i> .	D
42 <i>Echinus</i> sp., mature.	P	76 <i>Synapta inhærens</i> , skin, anchors and plates in situ.	M
43 <i>Echinus</i> sp., internal cast.	P	77 <i>Cucumaria crocea</i> .	D
44 <i>Echinus</i> anatomy.	D	78 <i>Holothuria pofi</i> , × 5.	M
45 <i>Echinus</i> internal anatomy.	D	79 <i>Chirodota violacea</i> , wheel-plates, × 40.	M
46 <i>Echinus</i> , anatomy of Aristotle's lantern.	D	80 Spicules of various Holothurians arranged.	M
47 <i>Echinus lividus</i> .	P	81 <i>Ophiothrix</i> , <i>Pluteus</i> , <i>Bipinnaria</i> , <i>Auricularia</i> (Hæckel 10).	D
48 <i>Echinus lividus</i> , in rock burrow.	D	82 <i>Thuroidea</i> , <i>Phylloporus</i> , <i>Synapta</i> (Hæckel 50).	D
49 <i>Echinus</i> sp., test partly denuded of spines.	P	83 <i>Cystoidea</i> , <i>Staurocystis</i> , <i>Pseudocrinus</i> (Hæckel 90).	D
50 <i>Sphaerechinus granularis</i> .	P	84 <i>Crinoidea</i> , <i>Pentacrinus</i> , <i>Metacrinus</i> (Hæckel 20).	D
51 <i>Echinocardium cordatum</i> , very young.	M	85 <i>Asterias</i> , <i>Hymanaster</i> , <i>Pteraster</i> (Hæckel 40).	D
52 <i>Cidaris imperialis</i> .	P	86 <i>Ophiodea</i> , <i>Ophiothrix</i> , <i>Pluteus</i> .	D
53 <i>Cidaris imperialis</i> , test denuded of spines.	P	87 <i>Echinidea</i> , <i>Cidaris</i> , <i>Sphaerechinus</i> (Hæckel 60).	D
54 <i>Heterocentrotus mammillatus</i> .	P	88 <i>Echinidea</i> , <i>Clypeaster</i> , <i>Echinocyaneus</i> (Hæckel 30).	D
55 <i>Heterocentrotus mammillatus</i> , T.S. spine.	M		
56-61 Transverse sections of spines of various sea urchins, very fine, especially when coloured.	M		

## Section AA 24—POLYZOA.

Plain Slides 1/3 each.

<b>FRESHWATER POLYZOA.</b>		<b>MARINE POLYZOA.</b>	
1 <i>Cristatella mucedo</i> , young.	M	12 <i>Bicellaria ciliata</i> , × 12.	M
2 <i>Cristatella mucedo</i> , young.	M	13 <i>Bugula calathus</i> , × 15.	M
3 <i>Cristatella mucedo</i> , young, side view.	M	15 <i>Bugula turbinata</i> , × 15.	M
4 <i>Fredricella sultana</i> , colony.	P	16 <i>Fuflustra papyracea</i> , dry.	P
5 <i>Lophopus crystallinus</i> , colony.	P	18 <i>Fuflustra</i> , <i>Bugula</i> , etc. (group).	P
6 <i>Lophopus crystallinus</i> , colony, × 5.	M	19 <i>Fuflustra</i> , <i>Bugula</i> , etc. (group).	P
7 <i>Lophopus crystallinus</i> , colony, dark ground, × 9.	M	20 <i>Fuflustra</i> , <i>Lepralia</i> , and <i>Bugula</i> .	D
8 <i>Lophopus crystallinus</i> , colony, × 25.	M	24 <i>Scopocellaria reptans</i> .	M
9 <i>Plumatella repens</i> , part of colony.	M	25 <i>Pedicellina</i> Sp.	M
10 <i>Plumatella repens</i> , dark ground.	M	26 <i>Actinotrocha</i> larva of <i>Phoronis</i> .	M
11 <i>Plumatella repens</i> , large colony on stone.	P	27 <i>Loxosoma tethys</i> , with bud.	M
		28 <i>Bryozoa</i> , <i>Cfistatella</i> , <i>Plumatella</i> (Hæckel, 25).	D
		29 <i>Bryozoa</i> , <i>Bugula</i> , <i>Fuflustra</i> (Hæckel, 33).	D

## Section AA 25—CHORDATA AGRANIA.

(Animals with the first indication of a spinal cord.)

<b>HEMICHORDA.</b>			
1 <i>Balanoglossus</i> .	P	12 <i>Perophora listeri</i> larva, × 35.	M
2 <i>Balanoglossus</i> .	D	13 <i>Pyrosoma</i> sp., T.S. colony.	P
3 <i>Balanoglossus Tornaria</i> larva.	M	14 <i>Salpa democratica</i> .	M
4 <i>Balanoglossus</i> , <i>Tornaria</i> larva, × 40.	M	15 <i>Salpa democratica</i> , with ova.	M
5 <i>Balanoglossus</i> , T.S.	P	16 <i>Amphioxus</i> , young, just hatched, × 40.	M
6 <i>Balanoglossus</i> , L.S.	P	17 <i>Amphioxus</i> , young.	M
<b>UROCHORDA (Tunicata).</b>		18 <i>Amphioxus</i> , head enlarged, showing appendages.	M
7 <i>Botryllus</i> sp.	D	19 <i>Amphioxus</i> , mature.	P
8 <i>Clavellina lepadiformis</i> .	M	20 <i>Amphioxus</i> , T.S.	M
9 <i>Clona intestinalis</i> .	M	21 <i>Amphioxus</i> , L.S., anterior.	M
10 <i>Fragarium elegans</i> , tadpole-like larva, × 40.	M	22 <i>Ascidia mammillata</i> .	P
11 <i>Perophora listeri</i> larvæ, × 10.	M	23 Structure of typical ascidian from model.	P
		24 <i>Cynthia</i> , <i>Molgula</i> , <i>Fragarium</i> , <i>Botryllus</i> , etc. (Hæckel).	D

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

**Section AA 26—POND LIFE.**

A new series of photographs and photomicrographs. A few drawings are marked D and photomicrographs M.

Plain Slides 1/3 each. Coloured, where suitable, 3/6 each.

**VEGETATION OF THE POND.**

- 1 A sluggish stream.
- 2 Pond with White Water Lilies.
- 3 Pond with Yellow Water Lilies
- 4 Pond with Caltha, Scirpus, etc.
- 5 Pond with Water Violet in flower
- 6 Pond with Potamogeton natans.
- 7 Iris pseudacorus (group).
- 8 Water Soldier in marsh.
- 9 Duckweed, floating.
- 10 Duckweed, Greater Duckweed.
- 11 Anacharis in flower.
- 12 Bladderwort.
- 13 Bladderwort, enlarged view of bladders. M
- 14 Forget-me-nots and Water Mint.
- 15 Burr Reed, flowering head.
- 16 Spirogyra in conjugation. M
- 17 Zygnema. M
- 18 Diatoms on alga. M
- 19 Diatoms, group. M
- 20 Desmids, group (Hæckel). D
- 21 Closterium. M
- 22 Volvox, with daughter colonies. M
- 23 Volvox, life history. D
- 24 Pandorina. D
- 25 Pediastrum. M
- 26 Pediastrum, various species (Hæckel). D
- 27 Chlamydomonas. M
- 28a Draparnaldia. M

**ANIMAL LIFE IN THE POND.**

- 28 Various forms of microscopic pond life. D
- 29 Amoeba, from life. M
- 30 Amoeba, showing nucleus. M
- 31 Actinosphaerium eichornii. D
- 32 Paramecium. D
- 33 Vorticella. D
- 34 Vorticella and Stentor on shell. D
- 35 Vorticella, Stentor, Carchesium, Epistylis (Hæckel). D
- 36 Euglena. M
- 37 Dendrocometes. M
- 38 Hydra, with stinging hairs. D
- 39 Hydra, with bud, from life. M
- 40 Hydra in L.S. D
- 41 Cordylophora, x 6. M
- 42 Planarian, Polycelis, x 10. M
- 43 Brachionus. D
- 44 Pedalion, Pteridina, Noteus, Stephanoceros, Brachionus (Hæckel). D
- 45 Rotifer vulgaris. M
- 46 Stephanoceros. M
- 47 Stephanoceros, on dark ground. M
- 48 Melicerta ringens. D
- 49 Melicerta ringens, building its house. D
- 50 Floscularia. D
- 51 Daphnia. M
- 52 Cyclops, male. M
- 53 Cyclops, female. M
- 54 Leptodora, on dark ground. M
- 55 Cypris. D
- 56 Asellus, Water Louse. M
- 57 Gammarus, Water Shrimp. M
- 58 Argulus, Fish Parasite. M
- 59 Water Spider on weed. M
- 60 Water Spider with diving bell.
- 61 Water Mite, Arrenurus. D
- 62 Stone Fly, larva.
- 63 Alder Fly, eggs on reed.
- 64 Alder Fly, eggs enlarged. M

- 65 Alder Fly, larva. M
- 66 Alder Fly, at rest.
- 67 Caddis Worm, in situ in sand case.
- 68 Caddis Worm, cases, 7 varieties.
- 69 Caddis Fly at rest on red sandstone.
- 70 May Fly, larva.
- 71 May Fly, larva. D
- 72 May Fly, just emerged, resting on reed.
- 73 May Fly, just emerged, resting on stone.

**DRAGON FLIES.**

- 74 Libellula, larva and nymph.
- 75 Libellula, with pupa case; just emerged. side view.
- 76 Libellula, later, with wings expanded.
- 77 Libellula, male, on reed, with wings expanded.
- 78 Aeschna on reed, wings expanded.
- 79 Aeschna, larva and nymph.
- 80 Aeschna, empty skin of nymph.
- 81 Agrion elegans on reed, side view.
- 82 Agrion eating Crane-fly.
- 83 Calopteryx, male, on reed, side view.
- 84 Dragon Fly, larva; head, showing mask. M

- 85 Vellu, showing beak. M
- 86 Water Scorpion, from life.
- 87 Water Boatman, from life.
- 88 Corixa on weed, from life.
- 89 Dytiscus larva, dorsal view.
- 90 Dytiscus larva; devouring Mayfly larva.
- 91 Dytiscus larva, head and jaws.
- 92 Dytiscus Beetle from life, male.
- 93 Dytiscus Beetle, sucker on foreleg of male. M
- 94 Dytiscus Beetle, spiracle. M
- 95 Dytiscus Beetle, trachea. M
- 96 Dytiscus Beetle, eye showing facets. M
- 97 Multiple images in eye of Dytiscus. M
- 98 Hydrophilus piceus, male and female.
- 99 Culex pipiens, gnat, egg raft. M
- 100 Culex pipiens, gnat, larva. M
- 101 Culex pipiens, gnat, pupa. M
- 102 Culex pipiens, gnat, breathing tubes. M
- 103 Culex pipiens, gnat, male. M
- 104 Culex pipiens, gnat, female. M
- 105 Culex pipiens, gnat, female, mouth organs. M
- 106 Culex pipiens, head and antennae, male. M
- 107 Anopheles, breeding place.
- 108 Anopheles, life history. D
- 109 Chironomus sp. ova. M
- 110 Chironomus sp. larva. D
- 111 Chironomus sp. male. M
- 112 Chironomus sp. female. M
- 113 Phantom larva and pupa, male, head. D
- 114 Phantom larva and pupa, female, head. D
- 115 Phantom larva, head enlarged. M
- 116 Phantom larva, tail. M
- 117 Eristalis larva. M
- 118 Simulium larva. M
- 119 Simulium pupa on reed. M
- 120 Simulium Fly. M
- 121 Plumatella colony. M
- 122 Cristatella colony. M
- 123 Plumatella, Cristatella, etc. D
- 124 Frog, egg to tadpole.
- 125 Frogs, from life.
- 126 Newt Tadpole, four-legged stage.
- 127 Great Crested Newt (Triton cristata).
- 128 Common Newts leaving water.

Opaque Lantern Screens, all sizes—See Catalogue F.



**Section AA 27—SEA AND SHORE LIFE.**

A new series, chiefly photographs of Living Specimens. A few drawings are marked D and photomicrographs M.

Plain Slides 1/3 each. Coloured, where suitable, 3/6 each.



No. 40 Daisy Anemone.

**COAST VIEWS.**

- 1 Rocky Coast, near South Stacks, Anglesey.
- 2 South Stacks, Anglesey, the Lighthouse.
- 3 Low tide, Barnacle Line, Bradda Head, I.O.M.
- 4 A Sandy Cove, Cornwall.
- 5 Breakers rolling in, Cornwall.
- 6 Pebbly Beach.
- 7 Shingle Beach, Dover Cliffs.
- 8 Fishing Fleet, Folkestone.
- 9 Kelp Hunters and Fishing Boats, Connemara.
- 10 Bringing Home the Kelp, Connemara.
- 11 Wrack Heaps, Corbière, Jersey.
- 12 Sand Dunes, Prestatyn.

**DEEP SEA COLLECTING.**

- 13 Trawls, Dredges, and Lobster Pots in store.
- 14 Trawls, Dredges, and Townets on board
- 15 Hauling in the Trawl.
- 16 Emptying the Trawl.
- 17 Contents of Trawl emptied out on deck.

**SHORE COLLECTING.**

- 18 Dredge, Sorting Tray, and Basket.
- 19 Shore Collecting, digging for worms.
- 20 Shore Collecting at a Rock Pool.

**THE BEACH.**

- 21 Sea Holly.
- 22 Herring Gull.
- 23 Four species of gulls at food } Plain.
- 24 Eggs of Tern amongst stones. } 1/6 each

**SEAWEED IN SITU ON ROCKS.**

- 25 Pelvetia, covered only at high tide.
- 26 Fucus exposed at mid-tide.
- 27 Laminaria and Hmanthalia exposed at lowest tides.

**ANIMAL LIFE.**

- 28 Protozoa Diatoms, etc., from Plankton. D
- 29 Plankton with Ceratium, etc., x 40.
- 30 Marine Hydrozoa, Plumularia
- 31 Marine Hydrozoa, Sertularia on Pecten shell.

- 32 Forms of British Medusæ. D
- 33 Jelly Fish, Aurelia (Hæckel). D
- 34 Sea Gooseberries, Cydippe, etc. (11). D
- 35 Anemones in Rock Pool.
- 36 Anemones in Rock Pool.
- 37 Anemones on beach.
- 38 Anemones, Tealia, from above.
- 39 Anemones, Tealia, side view.
- 40 Daisy Anemone.
- 41 Opelet Anemone.
- 42 Group of Anemones, Actinia, Bunodes, etc. D
- 43 Group of Anemones, Bunodiopsis, Aulac-tum, etc. D
- 44 Group of Anemones, numerous species. D
- 45 Plume Worms (Sabellæ), on beach at low tide.
- 46 Sabella pavonia, group showing plumes.
- 47 Sabellaria on rocks at low tide.
- 48 Serpula on oyster shell.
- 49 Serpula on Pecten Shell, living (enlarged)
- 50 Terebella (plumed tube worm).
- 51 Marine Annelids, Aphrodite, Nereis (Hæckel). D
- 52 Spirobræ, with plume. M
- 53 Green and Brown Plant-Animals, Convo-luta sp., x 10. D
- 54 Acorn Barnacles, Limpets, etc., on Fucus-covered Rock
- 55 Acorn Barnacles on Whelk Shell.
- 56 Ship's Barnacles on log.
- 57 Ship's Barnacles covering large log.
- 58 Shrimp from Life.
- 59 Prawn from Life.
- 60 Copepods from Plankton. M
- 61 Hermit Crabs and Obelia.
- 62 Crab Hiding between Stones.
- 63 Crab.
- 64 Underside of Crab with eggs.
- 65 Underside of Crab, mouth parts enlarged.
- 66 Spider-crab covered with seaweed.
- 67 Crayfish or Norway Lobster.
- 68 Sea Hare (Aplysia).
- 69 Limpet, under slide, against glass.
- 70 Limpet palate, x 40. M
- 71 Scrobicularia in situ on beach.
- 72 Common Whelks and Acorn Barnacles on rock.
- 73 Pecten, with valves open (in tank).
- 74 Whelk, egg mass.
- 75 Young Mussels in tank.
- 76 Cuttle fish, thrown up on beach, showing suckers.
- 77 Sepia, showing method of locomotion.
- 78 Octopus.
- 79 Flustra, Sea Mat (Hæckel). D
- 80 Young Starfish, showing tube feet. M
- 81 Sun-star.
- 82 Sea Urchins and larva (Pluteus) M
- 83 Sea Urchin (living).
- 84 Sea Urchin, showing Aristotle's Lantern.
- 85 Sea Urchin, upper and under side of shell without spines.
- 86 Smooth Blenny, from life.
- 87 Plaice on sand.
- 88 Young Plaice, just hatched.
- 89 Young Plaice, showing Eye turning. M
- 90 Sea Horse.
- 91 Cod fish stranded on beach.
- 92 Herring spawn on Sea Weed.
- 93 Egg Capsule of Skate opened to show Embryo.

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section  
L.S.—Longitudinal Section.

**Section AA 28—FISHES.**

Plain Slides 1/3 each. Coloured, where suitable, 2/6 each.

1 Amphioxus, young.	M	36 Codfish, with mouth open.	P
2 Petromyxon planerit, young.	M	37 Cod, gills of.	P
3 Skate, egg capsule, with embryo	P	38 Cod head, infested.	P
4 Ray, egg capsule.	P	39 Wolf fish, skull.	P
5 Rhina squatina, from model.	P	40 Sea Horses.	P
6 Torpedo, electric ray.	P	41 Great pipe fish.	P
7 Urogymnus asperrimus.	P	42 Pipe fish, head.	M
8 Dog fish, various sections.	P	43 Fish scales, native ornament.	P
9 Hammer-headed Shark.	P	44 Conger eel.	D
10 Shark, egg capsule.	P	45 Tobacco pipe fish.	D
11 Basking Shark.	P	46 Sword fish.	D
12 Basking Shark.	P	47 Angler fish (Lophius).	D
13 Basking Shark, mouth open.	P	48 Sun fish.	D
14 Plaice.	P	49 Polypterus.	D
14a Plaice, under side.	P	50 Sturgeon.	D
15 Plaice, young, showing migration of eye.	P	51 Thornback ray.	D
16 Plaice, young, just hatched.	P	52 Ostracion (Hæckel, 42).	D
17 Sole, skin with scales in situ.	M	53 Pegasus (Hæckel, 87).	D
18 Protopterus annectens mud fish.	P	54 Stickleback infested with Schistocephalus	P
19 Protopterus annectens, burrow.	P	trimorphus solidus.	P
20 Exocoetus volitans, flying fish.	P	55 Brain of Cod, with optic nerves and eyes.	P
21 Flying fish, wings expanded.	P	56 Flounder, showing both sides alike.	P
22 Fifteen-spined stickleback.	P	57 Siren or Mud-fish, S. Lacertina.	D
23 Herring spawn on Laminaria.	P	58 Angel fish.	D
24 Tarpon, in act of jumping.	P	59 Lepidosteus osseus.	P
25 Tarpon scales.	P	60 Lepidosteus osseus, head with teeth.	P
26 Black goby embryos.	M	62 Large Barbel.	P
27 Box fish scale.	M	63 Pike on grass.	P
28 Periophthalmus.	P	64 Perch, Anatomy, from model.	P
29 Lump sucker fish.	P	65 Eel, Leptocephalus larvæ.	P
30 Pike, skeleton.	P	66 Goby.	P
31 Perch, skeleton.	P	67 Ceratodus.	P
32 Roach.	P	68 Rostral Tooth of Saw Fish, L.S.	M
33 Lophius piscatorius, young.	M	69 Tooth of White Shark, L.S.	M
34 Eel skin, scales in situ.	M	70 Tooth Poebcagle Shark, L.S.	M
35 Sturgeon, armour plates of.	P	71 Tooth of Wolf Fish, L.S.	M

**Section AA 29—AMPHIBIA.**

(Frogs, Toads, and Newts.)

Plain Slides 1/3 each, unless otherwise marked. Coloured, where suitable, 3/- each.

(See also Section AA 26, Pond Life.)

1 Frog spawn.	P	21 Proteus anguinus.	D
2 Frog spawn, later stage.	P	22 Hyla (Hæckel 69).	D
3 Frog egg, segmentation stages.	D	23 Blood of Frog, x 960.	M
4 Frog, egg to tadpole.	D	24 Eyeball of Frog, x 11.	M
5 Frog tadpole, later stages.	D	25 Tongue of Frog, V.S.	M
6 Frog, common.	P	26 Head of Frog, T.S. showing eyes.	M
7 Frog, skeleton.	P	27 Thorax of Frog, T.S.	M
8 Frog, dissected for cranial nerves.	P	28 Thorax of Newt, T.S.	M
9 Frog, dissected for arterial system.	P	29 Toad and Worm.	P
10 Toad spawn, in strings.	P		
11 Toad, from life.	P		
12 Toad, male and female, from life.	P		
13 Toad, Natterjack.	P		
14 Toad, horned.	P		
15 Toad, Surinam.	P		
16 Toad, Surinam, young, in bark.	P		
17 Great warty newt (T. cristata).	P		
18 Crested newt (Molge cristata).	P		
19 Giant salamander (P. horrida).	D		
20 Axolotl (A. gullatus).	D		
		<b>A TOAD'S COURTSHIP (Crook Series),</b>	
		1/6 each.	
		40 "Leaving the Mere."	
		41 "Skirmishing Round."	
		42 "A Lady in Sight."	
		43 "Bashful."	
		44 "Hesitation."	
		45 "Artful Glances."	
		46 "His Mate is Won."	

Slides Toned to an Artistic Brown Shade cost 6d. each, or 4/6 per dozen extra.

**Section AA 30—REPTILES.**

(Snakes, Lizards, etc.)

Plain Slides 1/3 each, unless otherwise marked. Coloured, where suitable, 3/- each.

**SNAKES.**

- 7 Cobra, from life. P
- 8 Indian python, coiled on keeper. P
- 9 Xenopeltis unicolor, India. P
- 11 Smooth snake, life. P
- 13 Uroonophus durissus, banded rattlesnake. D
- 14 Cerastes hasselquistii. D
- 16 Pclamys bicolor, black-headed sea snake. D
- 17 Acrochordus jaranicus. D
- 18 Python molurus, rock snake. D
- 19 Boa constrictor. D
- 20 Tortrix scytale, coral snake. D
- 21 Bungarus fasciatus. D
- 22 Naja tripudians. D

**OTHER REPTILIA (Various).**

- 23 Anguis fragilis, slow-worm, life. P
- 24 Lacerta viridis, Jersey. P
- 25 Lacerta viridis, skeleton. P
- 26 Viviparous lizard, life. P
- 27 Sand lizard, life. P
- 28 Slow worm, showing primitive feet. P
- 29 Lacerta ocellata and Monitor lacerta. D
- 30 Pseudopus pallasi and P. lepidopodus. D
- 31 Scincus officinalis. D
- 32 Seps tridactylus, three-toed skink. P
- 33 Platydictylus aegyptiacus and Iguana tuberculata. D
- 34 Agama aculeata and Draco lineatus. D
- 36 Draco volans (with wing-like appendages). P
- 37 Chamaeleon vulgaris, on branch. P
- 37 Chamaeleon, dissected, to show eggs. P
- 38 Moloch horridus. P
- 39 Amphibosurus barbatus. P

- 40 Naranus exanthematicus. P
- 41 Chelone sp., young turtle. P
- 42 Turtle. P
- 43 Emys nigricans, dissected (arterial system). P
- 44 Emys scripta, written tortoise. D
- 45 Testudo graeca, tortoise. D
- 46 Chelonia virgata, striped tortoise. D
- 47 Tyse nloticus, three-toed tortoise. D
- 48 Crocodiles, on bank of river. P
- 49 Indian and nlotic crocodiles and spectated alligator. D
- 51 Chamaeleon pumilus, on branch from life. P
- 52 Poison Fang, Rattlesnake, T.S. M
- 53 Poison Fang, Python, L.S. M
- 54 Turtles, Testudo (Hueckel). D
- 55 Chamaeleon, Draconellus, Moloch, etc. (Hueckel). D
- 56 Sphenodon punctatus, skeleton. P

**CROOK SERIES.**

Plain Slides 1/6 each, Coloured 3/6 each.

- 52 Common Lizard, on ground. P
- 53 Common Lizard, on ground. P
- 54 Slow worm (Blindworm). P
- 55 Slow worm (Blindworm), another position. P
- 56 Grass Snake, on ground coiled up. P
- 57 Grass Snake, another position. P
- 58 Grass Snake, another position, head well shown. P
- 59 Viper and Grass Snake, together. P
- 70 Viper, female, basking on ground. P
- 71 Viper, female, coiled on ground. P
- 72 Viper, female, coiled another position. P
- 73 Viper, about to strike. P

**Section AA 31—EMBRYOLOGY OF CHICK.**

A new series of photographs and photomicrographs showing the various stages.

Plain Slides 1/6 each. Coloured 3/6 each.

- 1 Fowl dissected to show egg apparatus.
- 2 Chick Embryo, 24 hours, showing Primitive Streak, Neural Fold, 4 to 6 pairs of Somites.
- 3 Chick Embryo, 36 hours, Primitive Streak, Notochord, Head Fold, and beginning of brain, 14 to 17 pairs of Somites.
- 4 Chick Embryo, 48 hours, beginning of Brain, Eye, Heart, Ears, etc., 24 to 29 pairs of Somites.
- 5 Chick Embryo, 60 hours, Organs further developed, beginning of Tail Fold.
- 6 Chick Embryo, 72 hours, Cervical Flexure, Tail Fold well shown, Vitellina Artery, 4 pairs of Gill Slits.
- 7 Chick Embryo, 84 hours, Brachial Clefts shown and Aortic Arches established.
- 8 Chick Embryo, 96 hours, Allantois, Permanent Kidney and Ureter. Legs and Wings begin to show.
- 9 Chick Embryo, 2 days old, in situ in shell.
- 10 Chick Embryo, 3 days old, in situ in shell.
- 11 Chick Embryo, 5 days, Cartilaginous elements of Skeleton appear.
- 12 Chick Embryo, 8 days, Feathers begin to show through the skin.

- 13 Chick Embryo, 10 days, Feathers clearly visible, Egg Tooth on Beak.
- 14 Chick Embryo, 13 days, Yolk nearly absorbed, legs with toes complete.
- 15 Chick Embryo, 17 days, still further developed.
- 16 Chick Embryo, 20 days, fully developed.
- 17 Chick Embryo, 20 days, removed from shell.
- 18 Chick Embryo, 21 days, just hatched.

**PHOTOMICROGRAPHS OF SECTIONS.**

- 19 Chick Embryo, 24 hours, T.S. through Primitive Streak.
- 20 Chick Embryo, 48 hours, T.S. through Head.
- 21 Chick Embryo, 48 hours, T.S. through Body.
- 22 Chick Embryo, 72 hours, T.S. through Head.
- 23 Chick Embryo, 72 hours, T.S. through Body.
- 24 Chick Embryo, 72 hours, L.S. entire Embryo.
- 25 Chick Embryo, 5 days, L.S. entire Embryo.

All Slides may be had Plain—unless otherwise stated.  
 P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section  
 L.S.—Longitudinal Section.



198 Peregrine Falcon.

### Section AA 32—BRITISH BIRDS.

A series of selected photographs of British Birds taken in their natural surroundings by various experts.

A large number are by Mr. Stanley Crook, the noted nature-photographer.

As will be seen from the titles, the slides listed often show all the stages of the life history of the various species, viz., eggs in nest, the nestlings, the young at a later stage, partly or wholly fledged, and the adult bird (often both sexes).

Price: Plain Slides 1/6 each. Hand coloured, where suitable, 3/6 each. Sepia-toned 2/- each.

REPRODUCTION.—The photographs are all copyright, but in many cases we can arrange for their reproduction in book or other form at moderate fees. Terms on application.

ENLARGEMENTS.—Many of these photographs make beautiful pictures when enlarged.

Prices.—Sepia-toned on brown art mount for framing:

Size of photo, 12in. × 10in., 8/6 each.

„ „ 15in. × 12in., 10/6 each.

Prices for framing in oak or other style on application.

- 1 Song Thrush, nest and eggs of.
- 2 Song Thrush, at nest with young.
- 3 Song Thrush, at nest, side view.
- 4 Song Thrush, at nest, front view.
- 5 Song Thrush, young, in branch.
- 6 Redwing, dead bird on snow.

- 7 Missel Thrush, on nest.
- 8 Missel Thrush, nest and eggs of.
- 9 Blackbird, nest and eggs in tree.
- 10 Blackbird, nest and young on ground.
- 11 Blackbird, 4 young on branch.
- 12 Blackbird, female on nest.

Carrying Boxes, with Rubber Packing and Leather Handles—See Cover.

## Section AA 32—British Birds—Continued.

- 13 Blackbird, male on branch.  
 14 Ring Ousel, nest and eggs in heather.  
 15 Wheatear, nest and eggs of.  
 16 Wheatear, male.  
 17 Wheatear, female.  
 18 Whinchat, hen at nest.  
 19 Stonechat, nest and eggs of.  
 20 Stonechat, with large caterpillar.  
 21 Stonechat, male.  
 22 Stonechat, female.  
 23 Redstart, nest and eggs of.  
 24 Redstart, hen on branch.  
 25 Robin, nest and eggs of.  
 26 Robin, male, full view.  
 27 Robin, male, side view on stump.  
 28 Robin, male, at nest.  
 29 Robin, young on branch.  
 30 Nightingale, male with food.  
 31 Nightingale, female with food.  
 32 Nightingale, male at nest.  
 33 Nightingale, female at nest.  
 34 Hedge Sparrow, bird at nest.  
 35 Hedge Sparrow, sitting on nest.  
 36 Hedge Sparrow, nest and eggs of.  
 37 Whitethroat, male at nest.  
 38 Whitethroat, male with food.  
 39 Whitethroat, nest and eggs of.  
 40 Whitethroat, young on branch.  
 41 Lesser Whitethroat, nest and eggs of.  
 42 Garden Warbler, nest and eggs of.  
 43 Garden Warbler, female on nest.  
 44 Garden Warbler, male and female at nest.  
 45 Blackcap, nest and eggs of.  
 46 Blackcap, male on branch.  
 47 Reed Warbler, nest in reeds.  
 48 Reed Warbler, male at nest.  
 49 Reed Warbler, female on branch.  
 50 Reed Warbler, pair at nest.  
 51 Sedge Warbler, at nest.  
 52 Sedge Warbler, male at nest.  
 53 Grasshopper Warbler, nest and eggs of.  
 54 Grasshopper Warbler, bird at nest.  
 55 Chiffchaff, nest and eggs of.  
 56 Chiffchaff, and young on branch.  
 57 Chiffchaff, adult feeding young on branch.  
 58 Willow Warbler, nest and eggs of.  
 59 Willow Warbler, three young on branch.  
 60 Willow Warbler, adult with food.  
 61 Willow Warbler, on nest.  
 62 Goldcrest, nest in Spruce.  
 63 Goldcrest, female feeding young on branch.  
 64 Goldcrest, male feeding young on branch.  
 65 Great Tit, at food.  
 66 Great Tit, three young on branch.  
 67 Blue Tit, five young on branch.  
 68 Blue Tit, two adults at food.  
 69 Long Tailed Tit, at nest with feather.  
 70 Bearded Tit, male, at nest with young.  
 71 Bearded Tit, female, at nest with young.  
 72 Tree Creeper, on tree trunk by nest.  
 73 Wren, nest in tree.  
 74 Wren, nest in hayrick.  
 75 Wren, young in hand.  
 (See also No. 322.)  
 76 Dipper, nest by stream.  
 77 Dipper, adult.  
 78 Dipper, young.  
 79 Starling, at food.  
 80 Starling, young on rail.  
 81 Chough, bird at nest in site.  
 82 Chough, young.  
 83 Jay, nest in holly.  
 84 Jay, young on branch.  
 85 Jay, nearly full grown.  
 86 Jay, adult on branch.  
 87 Jay, robbing nest of Chaffinch.  
 88 Magpie, nest and eggs of.  
 89 Magpie, adult in tree.  
 90 Magpie, two young on branch.  
 91 Jackdaw, nest in rock hole.  
 92 Jackdaw, on stump.  
 93 Jackdaw, two young.  
 94 Hooded Crow, two young on rock.  
 95 Hooded Crow, young quarrelling.  
 96 Rook, young on branch, near view.  
 97 Rookery.  
 98 Rooks, neighbour stealing sticks.  
 99 Rooks, female asking male for food.  
 100 Rooks, male feeding young.  
 101 Rooks, young on branch being fed.  
 102 Rooks, young ready to fly.  
 103 Red-backed Shrike, nest and eggs of.  
 104 Red-backed Shrike, male bird on rail.  
 105 Red-backed Shrike, male bird at nest.  
 106 Red-backed Shrike, female bird at nest.  
 107 Spotted Flycatcher, young on branch.  
 108 Swallow, two nests together.  
 109 Swallow, three young in branch.  
 110 Swallow, near nest.  
 111 House Martin, young bird on ground.  
 112 Sand Martin, bird at nesting hole.  
 113 Greenfinch, nest and eggs of.  
 114 Goldfinch, nest and eggs of.  
 115 Goldfinch, bird on thistles.  
 116 Siskin.  
 117 House Sparrow, three young on branch.  
 118 Chaffinch, nest and eggs of.  
 119 Chaffinch, two young on branch.  
 120 Chaffinch, bird on nest.  
 121 Linnet, male.  
 122 Linnet, female.  
 123 Linnet, pair at nest.  
 124 Twite (Mountain Finch).  
 125 Bullfinch, nest and eggs of.  
 126 Bullfinch, male at nest with young.  
 127 Bullfinch, pair at nest.  
 128 Corn Bunting, nest and eggs of.  
 129 Corn Bunting, nest and young.  
 130 Yellow Hammer, pair of birds at nest.  
 131 Yellow Hammer, nest and eggs of.  
 132 Reed Bunting, nest and eggs of.  
 133 Reed Bunting, male bird on reeds.  
 134 White Wagtails, young.  
 135 Green Wagtail, on nest.  
 136 Green Wagtail, nest and eggs of.  
 137 Pied Wagtail, nest and eggs of.  
 138 Yellow Wagtail (Ray's) male on branch.  
 139 Yellow Wagtail, male, on nest.  
 140 Yellow Wagtail (Ray's) female on nest.  
 141 Tree Pipit, male at nest.  
 142 Tree Pipit, nest and eggs of.  
 143 Meadow Pipit, nest and eggs of.  
 144 Meadow Pipit, two young in nest.  
 145 Skylark, bird feeding young at nest.  
 146 Skylark, nest and eggs of.  
 147 Swift, nest and eggs of.  
 148 Swift, brooding on nest.  
 149 Swift, young, asleep in nest.  
 150 Swift, young, awake in nest.  
 151 Swift, female, on ground, (unable to fly).  
 152 Swift, young, climbing rock-face.  
 153 Swift, clinging to telegraph wires.  
 154 Nightjar, bird on nest in bracken.  
 155 Nightjar, bird on nest among leaves.  
 156 Nightjar, eggs on ground.  
 157 Nightjar, two young, mouths gaping.  
 158 Nightjar, two young, asleep in heather.  
 159 Great Spotted Woodpecker, on tree trunk.  
 160 Green Woodpecker, pair on tree trunk.  
 161 Kingfisher, nest with eggs.  
 162 Kingfisher, in his haunt.  
 163 Kingfisher, waiting for prey.  
 164 Kingfisher, watching his prey.

Section AA 32—British Birds—Continued.



AA 32—301 Herring Gull, young.

- 165 Kingfisher, about to fly.  
 166 Kingfisher, pair, male feeding mate with fish.
- A FINE SERIES SELECTED FROM MR. CROOK'S STUDIES OF THE LIFE OF THE CUCKOO.**
- 167 Cuckoo, egg in Meadow Pipit's nest.  
 168 Cuckoo, young, a few hours old.  
 169 Cuckoo, young, three days old, egg, with egg ejected.  
 170 Cuckoo, young, eight days old.  
 171 Cuckoo, young, ejecting young nestling.  
 172 Cuckoo, young, ten days (alone in nest.).  
 173 Cuckoo, young, on branch, male Pipit arrives with grubs.  
 174 Cuckoo, young, fed by Meadow Pipit, "discharging the cargo."  
 175 Cuckoo, young, with Meadow Pipit on its back.  
 176 Cuckoo and Meadow Pipit, "fed up, yet greedy for more."  
 177 Cuckoo, young, about to fly (five weeks old)—a fine photo.  
 178 Cuckoo, with male Pipit, on Furze—another series—two negatives.
- 179 Barn Owl, bird on rock.  
 180 Barn Owl, nest and eggs of.  
 181 Long Eared Owl, pair of young on branch.  
 182 Long Eared Owl, bird on stump.  
 183 Long Eared Owl, adult in wood.  
 184 Long Eared Owl, young, full grown.  
 185 Short Eared Owl, nest and eggs on ground.  
 186 Short Eared Owl, young on ground.  
 187 Tawny Owl, nest and eggs of.  
 188 Tawny Owl, in tree, asleep.  
 189 Tawny Owl, in tree, awake.  
 190 Tawny Owls, three young, on branch.  
 191 Sparrow Hawk, nest and eggs of  
 192 Sparrow Hawk, male bird on stump.  
 193 Sparrow Hawk, female at nest with young  
 194 Sparrow Hawk, female at nest with young.

- 195 Sparrow Hawk, bird at nest (another example).  
 196 Sparrow Hawk, young, on branch.  
 197 Peregrine Falcon, eggs in nest.  
 198 Peregrine Falcon, bird on rock with prey.  
 199 Peregrine Falcon, bird, wings extended.  
 200 Peregrine Falcon, three young, 12 days old.

Nos. 201, 202, 203.

Kestrel, female on nest.

2 or 3 new and beautiful photos.

Price 2s. 6d. each plain, 4s. coloured.

- 204 Kestrel, fledged, bird on stump.  
 205 Merlin female on rock, feeding.  
 206 Merlin, two young in nest with prey.  
 207 Merlin, four young in nest with prey.  
 208 Merlin female at nest on dunes with young eight days old.  
 209 Merlin, young, in nest on dunes, three weeks old.
- 217 Cormorants, at nest.  
 211 Cormorants, on nest with young.  
 212 Cormorants, on rocks.  
 213 Shag, young in nest.  
 214 Shag, nest and eggs.  
 215 Heron, at water's edge.  
 216 Heronry, in tree tops.  
 217 Mallard and young, in water.  
 218 Mallard Duck, on nest.  
 219 Mallard eggs in nest.  
 220 Mallard eggs, covered with down.  
 221 Pintail Duck, on water.  
 222 Scoter Duck, nest and eggs of.  
 223 Shoveller Duck, nest and eggs of.  
 224 Wigeon.
- 225 Swan, pair and nest.  
 226 Swan, pair with young, looking for food.  
 227 Swan, sitting on nest.  
 228 Ring Dove, nest and eggs.  
 229 Ring Dove, bird sitting.  
 230 Stock Dove, fledged young on branch.  
 231 Turtle Dove, nest and eggs of.  
 232 Turtle Dove, male at nest.  
 233 Turtle Dove, young on branch.  
 234 Red Grouse, full grown, in heather.  
 235 Red Grouse, nest and eggs of.  
 236 Pheasant, bird sitting on nest.  
 237 Pheasant, nest and eggs, "study in light and shade."  
 238 Pheasant, eggs and young, "batching-out day."
- 239 Partridge, sitting, "dead at her post."  
 240 Partridge, nest and eggs of.  
 241 Partridge, young.  
 242 Red-legged Partridge, nest and eggs of.  
 243 Red-legged Partridge, pair near nest.  
 244 Corncrake, nest and eggs of.  
 245 Corncrake, bird sitting on nest.  
 246 Water Rail. (See No. 224).  
 247 Water Rail, nest and eggs of.  
 248 Moor Hen, nest and eggs of.  
 249 Moor Hen, pair at nest.  
 250 Coot, nest and eggs of.  
 251 Coot, birds in water.
- 252 Golden Plover, nest and eggs of.  
 253 Golden Plover, on moor.  
 254 Golden Plover, bird at nest.  
 255 Golden Plover, eggs and young.  
 256 Ringed Plover, nest and 3 eggs on beach.  
 257 Ringed Plover, nest and 4 eggs on beach.  
 258 Ringed Plover, bird on nest.  
 259 Ringed Plover, young.  
 260 Lapwing, nest and eggs of.  
 261 Lapwing, nest with 5 eggs.  
 262 Lapwing, bird on nest.  
 263 Lapwing, eggs and young.

Slides Toned to an Artistic Brown Shade cost 6d. each, or 4/6 per dozen extra.

Section AA 32—British Birds—Continued.



AA 32—300 Herring Gull, nest and eggs.

- |                                                          |                                                                             |
|----------------------------------------------------------|-----------------------------------------------------------------------------|
| 264 Oyster Catcher, nest and eggs on sandy beach.        | 295 Common Gull, in flight.                                                 |
| 265 Oyster Catcher, nest and eggs on steep cliff.        | 296 Common Gull, pair at nesting site.                                      |
| 266 Oyster Catcher, bird approaching nest.               | 297 Common Gull, pair at nest.                                              |
| 267 Oyster Catcher, bird turning eggs with beak.         | 298 Common Gull, at nest, with young.                                       |
| 268 Woodcock, nest and eggs of.                          | 299 Common Gull, wings open.                                                |
| 269 Ruffs and Reeve.                                     | (Many other photos of this bird.)                                           |
| 270 Common Snipe, nest and eggs of.                      | 300 Herring Gull, nest and eggs of.                                         |
| 271 Common Snipe, young, hiding.                         | 301 Herring Gull, young in down answering mother's call.                    |
| 272 Common Snipe, young, in rushes.                      | 302 Herring Gull, on rock.                                                  |
| 273 Common Snipe, adult, near nest (protective marking). | 303 Herring Gulls, following plough.                                        |
| 274 Common Sandpiper, nest and eggs of.                  | 304 Herring Gull, immature plumage, full grown.                             |
| 275 Common Sandpiper, at nest with young.                | 304a Herring Gull, alighting.                                               |
| 276 Redshank, nesting haunt.                             | 305 Lesser Black Backed Gull, adult on nest.                                |
| 277 Redshank, young in down.                             | 306 Great Black Backed Gull, pair on rock.                                  |
| 278 Redshank, bird in flight.                            | 307 Kittiwake, on pier head.                                                |
| 279 Redshank, bird brooding young.                       | 308 Kittiwake, sitting on nest.                                             |
| 280 Curlew, nest and eggs of.                            | 309 Gullmots, eggs of.                                                      |
| 281 Curlew, bird on nest on moor.                        | 310 Gullmots at nesting cliff.                                              |
| 282 Curlew, young.                                       | 311 Razorbills, rows nesting on ledges.                                     |
| 283 Sandwich Tern, at nest.                              | 312 Razorbills, on rock.                                                    |
| 284 Sandwich Tern, nest and eggs of.                     | 313 Little Auk, on snow.                                                    |
| 285 Sandwich Tern, young.                                | 314 Puffin, on rock.                                                        |
| 286 Common Tern, nest and eggs of.                       | 315 Great Crested Grebe, bird on nest.                                      |
| 287 Common Tern, sitting on nest (mouth gaping).         | 316 Lesser Grebe (Dabchick), floating nest, eggs bare.                      |
| 288 Common Tern, sitting on nest (another).              | 317 Lesser Grebe, nest, eggs covered.                                       |
| 289 Lesser Tern, sitting on nest.                        | 318 Lesser Grebe, bird on nest.                                             |
| 290 Black-headed Gull, nest and eggs on moor.            | 319 Climbers at Bampton Cliffs.                                             |
| 291 Black-headed Gull, group near nests.                 | 320 Bird migration map, Europe.                                             |
| 292 Black-headed Gulls, over Gullery (sand dunes).       | 321 Bird migration map, E. Anglia.                                          |
| 293 Black-headed Gull, bird at nest (sand dunes).        | The following, though fine Photographs, are not actually from living birds: |
| 294 Black-headed Gull about to settle on nest (lake).    | 322 Common Wren.                                                            |
|                                                          | 323 Marsh Tit.                                                              |
|                                                          | 324 Water Rail.                                                             |

All Slides may be had **Plain**—unless otherwise stated.

**P**—Photograph. **D**—Drawing or Diagram. **M**—Photomicrograph. **T.S.**—Transverse Section.  
**L.S.**—Longitudinal Section.

**Section AA 33—FOREIGN BIRDS TAKEN IN CAPTIVITY, OR FROM MUSEUM SPECIMENS.**

Plain Slides 1/3 each.

- 1 Ostrich.
- 2 Ostriches, pair of.
- 3 Cape Penguins.
- 4 Penguins, group.
- 5 Penguins, group.
- 6 Pelican.
- 7 Pelicans, pair of.

- 8 Pelican, wings extended
- 9 Night Herons.

**FROM MUSEUM SPECIMENS.**

- 10 Apteryx.
- 11 The Hoatzin.

**Section AA 34—BIRD ANATOMY, SKELETONS, &c.**

- 1 Apteryx, Skeleton.
- 2 Penguin, Skeleton.
- 3 Pigeon, Skeleton.
- 4 Fowl, curved femur (monstrosity).
- 5 Pigeon, dissected, showing arteries, etc.
- 6 Fowl, gizzard with stones.
- 7 Corncrake, wing of.

- 8 Wigeon and Lapwing, wings of.
- 9 Pheasant's feathers, various.
- 10 Wigeon's feathers, various.
- 11 Feather, development of.
- 12 Duck, wing showing relations of bones and feathers.

**Section AA 35—BRITISH BIRDS FROM DRAWINGS.**

From a series of beautiful water-colour drawings, by Mrs. Kemp, drawn to scale, with natural surroundings, and carefully coloured. Price, hand-painted only, 3/- each.

- 1 Kestrel.
- 2 Hooded Crow.
- 3 Rook.
- 4 Jackdaw.
- 5 Jay.
- 6 Magpie.
- 7 Blackbird, male and female.
- 8 Waxwing.
- 9 Skylark at rest.
- 10 Crested Lark.
- 11 Shore Lark.
- 12 Rock Pipit.
- 13 Meadow Pipit.
- 14 Swallows on Roof.
- 15 Swallow on wing.
- 16 House-martins on roof, with nest.
- 17 House-martin.
- 18 Swift on wing.
- 19 Swifts, pair of, on wing (with Iris).
- 20 Great Tits, family of.
- 21 Cole Tits.
- 22 Bearded Tit.
- 23 Marsh Tit.
- 24 Blue Tits.
- 25 Long-tailed Tit.
- 26 Gold Crest.
- 27 Robins.

- 28 Lesser Redpoll.
- 29 Siskins, male and female.
- 30 Linnet.
- 31 Brambling.
- 32 Bullfinch, female.
- 33 Chaffinch.
- 34 Goldfinch.
- 35 Hawfinch, female.
- 36 Willow Warbler.
- 37 Bearded Reedling.
- 38 Yellow-hammer.
- 39 Snow Bunting.
- 40 Cuckoo.
- 41 Lesser Spotted Woodpeckers (pair).
- 42 Green Woodpecker.
- 43 Rockdove.
- 44 Ringdove.
- 45 Lapwing and young.
- 46 Golden Plover, with nest.
- 47 Ringed Plover (on shore).
- 48 Knot nestlings.
- 49 Water Rail.
- 50 Oyster Catcher.
- 51 Common Snipe.
- 52 Great Northern Diver.
- 53 Roseate Tern.
- 54 Kittiwake.
- 55 Black-backed Gull.
- 56 Gull-mot.
- 57 Little Grebe, pair.
- 58 Shelduck.
- 59 Razorbill.

**Section AA 36—ANIMALS (Chiefly Mammals).**

Photographs principally in Zoological Gardens or from stuffed specimens, which are marked "S."

Plain Slides 1/3 each.

- 1 Elephant, taking up water.
- 2 Elephant, drinking.
- 3 Camel.
- 4 Giraffe.
- 5 Lion, crouching attitude.
- 6 Indian ox.
- 7 Bison.
- 8 Mule.
- 9 Zebra.
- 10 Zebras, harnessed.
- 11 Sea Lions.

- 12 Hippopotami, at rest.
- 13 Hippopotamus, on the defence.
- 14 Hippopotamus, head above water.
- 15 Rhinoceros.
- 16 Rhinoceros.
- 17 Cape or red Hartebeest.
- 18 South African Antelope.
- 19 Antelope.
- 20 Deer.
- 21 Mountain Goat.
- 22 Kangaroo.

Lecture Lanterns in various patterns—See Catalogue F.



**Section AA 36—Animals (Chiefly Mammals)—Continued.**

24	Fennec Fox.	S	43	Striped Phalanger.	S
25	Dog Wolf.	S	44	Taruan flying Phalanger.	S
26	Ringtailed Lemurs.	S	45	Pigmy flying Phalanger.	S
28	Porcupine.	S	53	Punjab wild sheep, male.	S
29	Duck-billed Platypus.	S	54	Chamois.	S
30	Duck-billed Platypus, injected.	S	55	1-borned and 4-horned Indian Sheep.	S
32	Common Womhat.	S	56	Samhur Stag.	S
34	Common Opossum and young.	S	57	Wapiti Stag.	S
35	Koala and young.	S	58	Grévy's Zebra.	S
36	Tree-climbing Kangaroo.	S	59	Mountain Zebra.	S
37	Three-toed sloth.	S	60	Hybrid, Burcoll's Zebra and Pony.	S
39	Spiny Ant-eater.	S	61	Nigal Antelope.	S
40	Peha Armadillo.	S	62	Black Antelope, male.	S
42	Lesser flying Phalanger	S	63	Brindled Gnu	S

**Section AA 37—ANIMAL PHOTOGRAPHS (Mostly British).**

Plain Slides 1/6 each. Coloured, where suitable, 3/6 each.

1	Whaling Station, Norway.	16	White Rat, at food.
2	Rorqual Whale, stranded on beach near Scarborough.	17	Dormouse, on palm of hand.
3	Rorqual Whale.	18	Field Mouse, in nature.
4	Grey Seal, on grass.	19	Squirrel, on tree trunk.
5	Herd of Deer in Forest (Winter).	20	Noctule Bat, flying, front view (stuffed).
6	Hedgehog, walking.	21	Noctule Bat, flying, back view (stuffed).
7	Hedgehog, rolled up.	22	Skeleton of Bat's Wing, front view.
8	Mole, in field.	23	Pip-strelle Bat, hanging.
9	Mole, near view.	24	Long-eared Bat, at rest.
10	Mole, from above, showing feet.	25	Whiskered Bat, back view.
11	Mole, head from below, showing mouth.	26	Dashenton's Bats, on branch.
12	Mole, hands enlarged.	27	Great Horse-shoe Bat, flying (stuffed).
13	Water Vole, pair by stream.	28	Short-tailed Field Mouse, with young
14	Leveret, hiding in stubble.	29	Short-tailed Field Mouse, removing young in mouth.
15	Wild Rabbit, young in grass.		

FOR RECENT ADDITIONS } See Page 99

**Section AA 38—PHOTOGRAPHS OF PRIZE LIVE STOCK.**

as exhibited at the Royal Show. By the kind permission of Messrs. W. Cooper & Nephews. From original photographs.

Plain Slides 1/3 each.

**HORSES.**

1	Judging Shire Horses, Royal Show, Norwich, 1911
2	Shire Mare, "Misty Morn." Sir Walpole Greenwell.
3	Shire Stallion, "Leonardo." Mr. Forshaw.
4	Suffolk Stallion, "Morston Samson." Mr. A. T. Pratt.
5	Suffolk Stallion, "Morston Peter." Mr. A. T. Pratt.
6	Suffolk Mare, "Bawdsey Wax Doll." Sir Cuthbert Quilter.
7	Cleveland Bay Stallion, "Cholderton Luck." Mr. John Lett.
8	Clydesdale Mare, "Peggy Pride." Mr. J. E. Kerr.
9	Hackney Stallion, "Sprightly Danegelt." Exors. of late M. B. Lucas.
10	Harness Mare, "Queen of Ayr." Mr. P. Smith.
11	Polo Pony Stallion, "Othrae." Sir J. Barker, Bart.
12	3-year-old Pony Stallion.
13	Welsh Mountain Pony Stallion, "Grey-light." Mr. E. Jones.
14	Shetland Pony Stallion, "Silverton of Transy." Mr. W. Mungall.
15	Shire Stallion, "Warton Draughtsman." Duke of Devonshire.
16	Hunter Gelding, "Cavendish." Mr. Midwood.

**SHEEP.**

27	Southdown Shearling Ram. Sir J. Colman, Bart.
28	Southdown 2 Shear Ram. Mr. C. Adeane.
29	3 Southdown Ewes. Sir J. Colman, Bart.
30	Shropshire Shearling Ram. Sir Richard Cooper, Bart.
31	Shropshire 2 Shear Ram. Mr. T. Minton.
32	Pen of 5 Shropshire Rams. Sir Richard Cooper, Bart.
33	Cotswold Ewes. Mr. W. Houlton
34	Lincoln Shearling Ram. Mr. H. Dudding.
35	Lincoln 2 Shear Ram. Mr. T. Caswell.
36	Lincoln Ewes, in full fleece. Mr. Swallow.
37	Lincoln Ewes, shorn. Mr. H. Dudding.
38	Leicester Shearling Ram. Mr. C. Harrison.
39	Border Leicester Shearling Ram. Mr. D. P. Elliot.
40	Border Leicester Glimmer. The Scremerston Coal Co.
41	Oxford Down Ram. Mr. J. Horlick.
42	3 Oxford Down Ewes. Hon. A. Brassey.
43	Wensleydale Ram. Mr. Proctor.
44	Romney Marsh 2 Shear Ram. Mr. Chas. File.
45	Suffolk 2 Shear Ram. Mr. H. E. Smith.
46	Dorset Horn Ram. Mr. W. R. Flower.
47	Devon Longwood 2 Shear Ram. Mr. Cooke.
48	Exmoor Ram. Mr. P. Smyth.
49	Dartmoor Ram. Mr. R. S. Luscombe.
50	Loak Ram. Mr. Hague.

Slides Toned to an Artistic Brown Shade cost 6d. each, or 4/6 per dozen extra.

Section AA 38—Photographs of Prize Live Stock—Continued.

- 51 Cheviot Ram. Mr. Robson.  
 52 Cheviot Gimmer. Mr. Robson.  
 53 Blackfaced Ram. Mr. Robson.  
 54 Ryeland Ram. Mr. F. E. Gough.  
 55 Herdwick Ram. Mr. T. Ireland.  
 56 Hampshire Down Ram. Mr. J. Flower.

**CATTLE.**

- 68 Shorthorn Bull, "Chiddingstone Malcolm."  
 Sir Rd. Cooper, Bart.  
 69 Shorthorn Heifer, 3-year-old, "Waterloo  
 Lady 36th." Sir Rd. Cooper, Bart.  
 70 Shorthorn Bull, "Village Diamond." Duke  
 of Portland.  
 71 Shorthorn Dairy Cow, "Hawthorn 7th."  
 Messrs. Hobbs.  
 72 North Devon Bull, "Highfield Noble." Mr.  
 C. Morris.  
 73 Devon Cow, "Pound Brassey 12th." Mrs.  
 Skinner and Sons.  
 74 Hereford Bull, "Quarto." Mr. W. H.  
 Taylor.  
 75 Hereford Heifer, "Shelsley Primula." Mr.  
 J. G. Cooke-Hill.  
 76 Red Poll Bull, "Letton Vanity Davyson."  
 Lord Carnforth.  
 77 Red Poll Cow, "Chadda." Sir Alwyn  
 Fellows.  
 78 Galloway Bull, "Marchfield Despised."  
 Mr. Graham.  
 79 Aberdeen Angus Cow, "Juanista Erica."  
 Mr. J. E. Kerr.  
 80 Ayrshire Cow, "Dewdrop 1st of Old Grait-  
 ney." Mr. Kerr.

- 81 Highland Cow and Calf, "Madame Luna."  
 Mr. Sopper.  
 82 Lincoln Red Cow, "Benniworth Bloom."  
 Mr. J. Evens.  
 83 Sussex Bull, "Prince of Lock II." Mr. W.  
 A. Thornton.  
 84 Longhorn Bull, "Eastwell Eagle." Lord  
 Gerard.  
 85 Welsh Bull, "Wern Emperor." Mr. J.  
 Scourfield.  
 86 British Holstein Cow, "Melford Eva."  
 87 British Holstein Cow, "Gorstage Gonda."  
 Mrs. Townshend.  
 88 Jersey Bull, "Coddington Winks." Mr. A.  
 Miller-Hallett.  
 89 Jersey Cow, "Cute II." Lord Rothschild.  
 90 Guernsey Cow, "Hayes Olive." Sir E. A.  
 Hambro.  
 91 Kerry Cow, "Penella." Lady Greenall.

**PIGS.**

- 102 Large White Boar, "Turk of Worsley."  
 Mr. A. W. White.  
 103 Large Black Boar, "Drayton Disappoint-  
 ment." Mr. T. F. Hooley.  
 101 Lincolnshire Curly-coated Boar. Mr. L. C.  
 Harvey.  
 104 Lincolnshire Curly-coated Sow, Mr. L. C.  
 Harvey.  
 106 Berkshire Sow, "Reform." Mr. W. V.  
 Rudd.  
 107 Middle White Sow, "Holywell Yorkshire  
 Rose." Mr. C. Spencer.

Section AA 39—EVOLUTION.

Plain Slides 1/3 each.

**MAN AND HIS RELATIONSHIPS.**

- 1 Human Embryo, 6 weeks.  
 2 Human Embryo, 3 months.  
 3 Human Embryo, T.S. Abdomen.  
 4 Human Embryo, T.S. Thorax.  
 5 Human Embryo Developing Tooth, V.S.  
 x 25.  
 6 Skull of New-born Child, showing sutures.  
 7 Embryos of Hog, Calf, Rabbit, Man.  
 8 Embryos of Fish, Salamander, Tortoise,  
 Chick.  
 9 Human Skeleton, front view.  
 10 Human Skeleton, back view.  
 11 Skeletons, Gibbon, Orang, Chimpanzee,  
 Gorilla, and Man.  
 12 Homo neanderthalensis, Spy, Skull cast.  
 13 Homo neanderthalensis, interior of Skull.  
 14 Homo neanderthalensis, Mandible.  
 15 Homo sapiens, Engis, Skull, cast.  
 16 Homo sapiens, Cro-magnon, Skull, cast.  
 17 Nictitating membranes Man and various  
 animals.  
 18 Human Ear, vestigial characters.

- 19 Brains of Man and Chimpanzee.  
 20 Man and Chimpanzee, Hair tracts on arm.  
 21 Child swinging from rope.  
 22 Hands and feet of Apes and Monkeys.  
 23 Skull of Monkey.  
 24 Skeleton of Monkey, seated.  
 25 Skull of Mycetes, with sound organs.  
 26 Skeleton of Lemur.  
 27 Skull of Chimpanzee.  
 28 Skull of Gorilla.

**VARIOUS ANIMAL TYPES, CONNECTING LINKS, Etc.**

- 39 Campodea, Primitive Insect, x 11. M  
 40 Peripatus capensis. P  
 41 Peripatus capensis, showing eye. P  
 42 Peripatoides orientalis, section showing  
 eggs. M  
 43 Peripatoides, section showing cerebral  
 ganglia. M  
 44 Trilobite Larva of Limulus. P  
 45 King Crab, Limulus.

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section.  
 L.S.—Longitudinal Section.

**Section AA 40—PRIMITIVE MAN.**

Consisting of a number of ideal scenes from various sources. Photographs of stone, bronze, and other implements from the collections in the Manchester Museum, and various standing stones—including Stonehenge.

Plain Slides 1/3 each. Coloured, where suitable, 3/6 each.

(For SKULLS OF PRIMITIVE MAN see Section AA 39—Evolution.)

**OLD STONE AGE.**

- 1 Production of Fire.
- 2 Man attacked by Bear.
- 3 Funeral Feast.
- 4 Mammoth Hunt.
- 5 Ideal Scene, Wookey Hole.
- 6 Stuffed Mammoth.
- 7 Man of the Reindeer Epoch.
- 8 Rock Shelters, Bruniquet, France.
- 9 Hunters in Rock Shelter at night.
- 10 Feast in Reindeer Epoch.
- 11 Art in Reindeer Epoch, Drawing and Sculpture.
- 12 Funeral Ceremony, Reindeer Epoch.
- 13 Hunting the Reindeer.
- 14 The Chase, Reindeer Epoch.
- 15 Rough Stone Axe.
- 16 Stone Knives, various.

**NEW STONE AGE.**

- 27 Man of the Polished Stone Epoch.
- 28 Fishing in the Stone Age.
- 29 Making and Polishing Flints.
- 30 Bread Making, Stone Age.
- 31 The earliest Navigator.
- 32 Swiss Lake Dwellings, Neolithic.
- 33 The earliest conflict between men.
- 34 The First Potter.
- 35 Tumulus of Polished Stone Age.
- 36 Probable method of using early flint weapons.
- 37 Chipped Celt.
- 38 Polished Celt, Over Haddon, Derbyshire.
- 39 Polished Celt, mounted in handle.
- 40 Grinding Stone used for making Celts.
- 41 Flint Scrapers and Knives.
- 42 Spear and Arrow Heads.
- 43 Spindle Whorls of Stone, also Fabrics of the period.
- 44 Stone Axe in haft of Deer Antler.
- 45 Pikes and tools made from Deer Antlers.

**BRONZE AGE.**

- 56 Workshop in the Bronze Age.
- 57 Swiss Lake Village.
- 58 The Chase, Bronze Age.
- 59 The First Weaver.
- 60 Stone Hammers, two styles.
- 61 Perforated Stone Axe.

- 62 Bronze Celts, various types.
- 63 Bronze Spear Heads.
- 64 Burial Urn.
- 65 Domestic Pottery.

**IRON AGE.**

- 76 Iron Smelting Furnace.
- 77 Funeral Ceremonies, Iron Age.
- 78 The Chase, Iron Age.
- 79 Iron Sickle and Plough Share.
- 80 Iron Axe, Adze, and Hammer.
- 81 Pottery of the Iron Age.
- 82 Querns for grinding Corn.

**VARIOUS.**

- 93 Kitchen Middens and their dwellings.
- 94 Ruins of Cliff Dwellings, Mancos Canon, Colorado.
- 95 Abandoned Cliff Dwellings, near Esplanola.
- 96 Pueblo Indian Village, La Guna.
- 97 Pueblo Indian Village, Inner Court.
- 98 Adobe Village of Pueblo Indians
- 99 Mexican ovens of Pueblo Indians
- 100 Natives feasting on Horse-flesh.
- 101 Ancient Dug-out Boat excavated at Preston Docks.
- 102 Ancient Carving, "The Chase" in King's Caves, Drummadon, Arran.

**STANDING STONES, Etc.**

- 113 Stonehenge, general view.
- 114 Stonehenge, interior.
- 115 Stonehenge, from West.
- 116 Stonehenge, from North.
- 117 Stonehenge, from East.
- 118 Stonehenge, from South.
- 119 Cromlech, Gorey, Channel Islands.
- 120 Cromlech and Standing Stones, Gorey, Channel Islands.
- 121 Group of Standing Stones, Callwick, West Coast, Isle of Lewis.
- 122 Arran Stone Circle, Standing Stone outside.
- 123 Arran, Stone Circle from the Standing Stone.
- 124 Arran, Stone Circle, another view.
- 125 Arran, Stone Circle, another view.
- 126 Arran, Stone Circle, another view.

Slides Toned to an Artistic Brown Shade cost 6d. each, or 4/6 per dozen extra.

**Section AA 39—Continued.**

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> <li>46 Tadpoles of Frog and Ascidian.</li> <li>47 Various Marine Larval Forms.</li> <li>48 Various Marine Larval Forms.</li> <li>49 Archæopteryx, fossil.</li> <li>50 Archæopteryx, restoration.</li> <li>51 Ilesperurus regalis, Skeleton—fossil.</li> <li>52 Opisthocomus, Bird with hook in wing.</li> <li>53 Dodo, restoration.</li> <li>54 Dinornis, Skeleton.</li> <li>55 Wings of Retile, Mammal and Bird.</li> <li>56 Peacock's Feathers, Evolution of Eye Spot.</li> <li>57 Peacock's Feathers, Evolution of Eye Spot.</li> <li>58 Peacock's Feathers, Evolution of Eye Spot.</li> <li>59 Peacock's Feathers, Evolution of Eye Spot.</li> <li>60 Siren, showing external Gills.</li> <li>61 Wombat, Skeleton.</li> </ol> | <p>P</p> <p style="font-size: 2em;">}</p> <p>Coloured,<br/>3/6 each</p> | <ol style="list-style-type: none"> <li>62 Wallaby, Skeleton.</li> <li>63 Three Toed Sloth, Skeleton.</li> <li>64 Greenland Whale, Skeleton.</li> <li>65 Seal, Skeleton.</li> <li>66 Mammoth, Skeleton.</li> <li>67 Ornithorhynchus, Duck-Bill Platypus.</li> <li>68 Ornithorhynchus, showing Skeleton.</li> <li>69 Apteryx.</li> <li>70 Apteryx, Skeleton.</li> <li>71 Skulls of Wild and Lop-eared Rabbits.</li> <li>72 Feet of Fossil Horses, Eocene to Myocene.</li> <li>73 Feet of Fossil Horses, Myocene to Recent.</li> <li>74 Mesohippus lingipes, Skull.</li> <li>75 Skull of Horse, side view, diagrammatic.</li> <li>76 Hipparian, Wild Horse, Restoration.</li> <li>77 Evolution of Foot of Horse.</li> <li>78 Pterodactyl, Restoration.</li> <li>79 Pterodactyl, Skeleton.</li> <li>80 Dinosaur, Skeleton.</li> <li>81 Dinosaur, Restoration.</li> </ol> |
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See also Section G 6—Fossil Vertebrata.

# BOTANICAL SLIDES.

## Section BB 1—BACTERIA.

Plain Slides only, 1/3 each.

### APPARATUS USED IN BACTERIOLOGY.

1 Microscope.	P
2 Koch's steam sterilizer.	D
3 Autoclave.	D
4 Incubator and section of same.	D
5 Inoculating a culture tube.	P
6 Tube cultures of bacteria.	D
7 Suspended drop culture.	D
8 Pacter flask.	D
9 Wolfenbügel's counting chamber.	D
10 Tyndall's germ-free chamber.	D
11 Hesse's apparatus for air.	D
12 Serum syringe, aseptic.	D
13 Cornet's forceps in use.	P

### INTRODUCTORY.

14 Type Slide of Bacteria.	D
15 Various forms of Bacteria.	D
16 Flagellated Bacteria, various forms.	D
17 Spore formation in Bacillus.	D
18 Micrococci, various forms.	D
19 Spirilla, various forms.	D
20 Swimming protoplasts.	D
21 Creeping protoplasm (Amœboid).	D
22 Phagocyte with Plague Bacilli.	D
23 Amœba infected with Microsphaera.	D
24 Malarial parasites in blood.	D

### PHOTOMICROGRAPHS—Mostly on Micrometer Scales.

#### BACILLI.

30 Bacillus anthracis, × 1,000.	
31 Bacillus anthracis symptomatici, × 1,000.	
32 Bacillus bronchisepticus, × 1,000.	
33 Bacillus cholera gallinarum, × 1,000.	
34 Bacillus coli communis, × 1,000.	
35 Bacillus cyanogenus, × 1,000.	D
36 Bacillus diphtherie, × 1,000.	
37 Bacillus dysenterie, × 1,000.	
38 Bacillus of hog cholera, × 1,000.	
39 Bacillus icteroides, × 1,000.	
40 Bacillus lepræ, × 1,000.	D
41 Bacillus mallei, × 1,000.	
42 Bacillus œdematis maligni, × 1,000.	
43 Bacillus pestis, × 1,000.	
44 Bacillus pyocyaneus, × 1,000.	
45 Bacillus septus, × 800.	

45 Bacillus tetani, × 1,000.	
47 Bacillus tuberculosis, × 1,000.	
48 Bacillus tuberculosis in sputum, × 1,000.	
49 Bacillus typhosus, × 1,000.	
50 Bacillus typhosus, with flagellæ, × 1,000.	
51 Nature's food cycle.	D
52 Bacteria nodules on Lupin root.	P
53 Pseudomonas radicleola, from Clover-root nodules, × 1,000.	
54 Pseudomonas radicleola culture, × 1,000.	
55 B. nitrosomonas (nitrifying organism of soil), × 1,000.	
56 B. denitrificans (denitrifying organism), × 1,000.	

#### COCCI.

67 Micrococcus catarrhalis, × 800.	
68 Micrococcus gonorrhœæ, × 1,000.	
69 Diplococcus pneumoniae, × 1,000.	
70 Staphylococcus pyogenes aureus, × 1,000.	
71 Streptococcus pyogenes, × 1,000.	
72 Streptococcus pyorrhœæ, × 1,000.	
73 Streptococcus rheumaticus, × 1,000.	
74 Micrococcus tetragenus, × 1,000.	

#### SPIRILLA.

85 Spirillum undula, × 1,000.	
86 Spirillum cholera asiatica, × 1,000.	
87 Spirillum rubrum, × 1,000.	

#### FUNGI.

(See also Sections BB 5, BB 6, and BB 7.)	
98 Actinomyces, group of heads.	D
99 Actinomyces in section.	M
100 Beggiatox, Sewage fungus, × 1,000.	M
101 Thiothrix and Crenothrix, × 325.	
102 Yeasts, S. cerevisæ and S. Pastorianus I. and II.	
103 Yeasts, S. Pastorianus III. and S. Ellipsoideus.	D
104 Saccharomyces cerevisæ, × 1,000.	M
105 Saccharomyces exiguus, × 270.	M
106 Top Yeast with spores, × 500.	M
107 Ginger Beer Plant, × 250.	M
108 Sarcina aurantiaca, × 1,000.	M
109 Mucor rhizopodoformis, × 1,000.	M
110 Mucor rhizopodoformis, × 250.	M
111 Eurotium aspergillus glaucus, × 270.	M

## Section BB 2—ALGAE—Marine and Fresh Water.

Principally photographs and photomicrographs.  
Plain Slides 1/3 each.

### SCHIZOMYCETES.

1 Nostoc, × 40.	M
2 Anabaena azollæ.	M
3 Rivularia, × 45.	M
4 Gloeotrichia, × 45.	M
5 Gloeocapsa, × 300.	M
11 For Phytosarcodina (see Myxomycetes, Section BB5).	

### BACILLARIOPHYTA.

12 Diatoms (see also Section BB3).	
13 Diatoms, arranged circle.	
14 Diatoms, arranged circle.	M
15 Diatoms, dark ground.	M
16 Diatoms, Rosette.	M
17 Diatoms, Star.	M
18 Diatoms, Star, King George's Sound.	M
19 Diatoms, arranged Bouquet.	M
20 Diatoms on Marine alga, × 9.	M
21 Diatomaceous ooze, Atlantic, × 60.	M

### CONJUGATE (including Desmids).

22 Desmids, various, Kerner.	D
23 Closterium (living).	D
24 Zygnema, conjugation and zygospores.	M
25 Spirogyra, normal and conjugation	M
26 Spirogyra, zygospores.	M

### CHLOROPHYCEÆ.

32 Volvox, with daughter colonies.	M
33 Volvox, with reproductive organs.	D
34 Pleurococcus vulgaris, × 180.	
35 Pleurococcus, 2 on tree trunk.	P
36 Botrydium.	M
37 Hydrodictyon, × 32.	M
38 Pediastrum colonies.	M
39 Ulothrix zonata.	D
40 Ulothrix zonata Kerner.	D
41 Calothrix, gametangia, × 500.	M
42 Chætophora, × 40.	M
43 Colochaete.	M

All Slides may be had Plain—unless otherwise stated.  
P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section.  
L.S.—Longitudinal Section.

**Section BB 2—Algae—Marine and Fresh Water—Continued.**

44 Coleochaete life cycle.	M	80 Fucus vesiculosus, female conceptacle.	M
45 Edogonium germinating oogonidia.	M	81 Fucus vesiculosus, female conceptacle (Kerner).	D
46 Edogonium, with dwarf male.	M	82 Fucus platycarpus, T.S. showing conceptacles.	M
47 Edogonium, male gamete fusing with oogonium.	M	83 Pelvetia, on rock.	P
48 Cladophora refracta.	M	84 Pelvetia, Antheridia.	M
49 Vaucheria developing zoospores.	M	85 Pelvetia, Cognition.	M
50 Vaucheria with galls of Notomata, x 40.	M		

**CHAROPHYTA.**

61 Chara hispida, E.	P
62 Chara fruit formation (Kerner)	D
63 Chara developing sexual organs.	M
64 Chara Sporogonia.	M
65 Chara "Apical cell," L.S., x 170.	M
66 Nitella, V.S. showing development of oogonium, x 250.	M

**PHÆOPHYCÆ.**

72 Ectocarpus siliculosus.	M
73 Desmarestia aculeata.	P
74 Laminaria and Himanthalia	P
75 Laminaria, T.S. Thallus (spores), x 40.	M
76 Sphaecularia cirrhosa (propagula).	P
77 Fucus vesiculosus on rock (middle tide).	P
78 Fucus vesiculosus, male conceptacle.	M
79 Fucus vesiculosus, male conceptacle (Kerner).	D

**FLORIDEALES.**

96 Lemanea, T.S.	M
97 Batrachospermum.	M
98 Gelidium corneum and latifolium.	P
99 Plocamium coccineum.	P
100 Plocamium, Tetraspores, x 9.	M
101 Polysiphonia nigrescens.	P
102 Polysiphonia nigrescens, cystocarps.	M
103 Polysiphonia Brodiaei.	P
104 Polysiphonia Brodiaei, Tetraspores.	M
105 Polysiphonia Brodiaei, cystocarps.	M
106 Polysiphonia fastigata, cystocarps, x 9.	M
107 Polysiphonia, oogonium.	M
108 Dasya coccinea.	P
109 Dasya venusta.	M
110 Callithamnion brachiatum, cystocarps.	P
111 Ceramium ciliatum.	P
112 Ceramium Tetraspores.	M
113 Corallina, L.S.	M

**Section BB 3—DIATOMS.**

A series of Photomicrographs of Selected Specimens.

The magnification is marked on each.

Plain Slides only, 1/3 each.

1 Diatoms from Oamaru, arranged group.	23 Gomphonema geminatum.
2 Diatoms, various localities, arranged group	24 Heliopelta Metii.
3 Diatoms, various localities, arranged group, Dark ground.	25 Navicula lyra.
4 Diatoms, various, Arranged Star.	26 Navicula Yarrensis.
5 Diatomaceous Ooze (Challenger).	27 Orthoneis splendida.
6 Diatoms on alga.	28 Podocystis adriatica.
12 Arachnoidiscus Ehrenbergii.	29 Pinnularia cardinalis.
13 Arachnoidiscus ornatus.	30 Pleurosigma angulatum, general view.
14 Auliscus Moronensis.	31 Pleurosigma angulatum, portion highly magnified.
15 Auliscus Tollittianus.	32 Stictodiscus Nova-Zelandicus.
16 Astrionella formosa.	33 Surirella Fullebornii.
17 Asterolampra acutiloba.	34 Triceratium crenulatum.
18 Buddulphia pulchella.	35 Triceratium favus.
19 Cestodiscus superbus.	36 Triceratium favus, v. quadrata.
20 Craspedodiscus coccinodiscus.	37 Triceratium Kinkarianum.
21 Craspedodiscus elegans.	38 Triceratium pulvinar.
22 Climacocira mirifica.	39 Triceratium scitulum, v. quadrata.
	40 Trinacria excavata.

**Section BB 4—FUNGI.**

A series of selected photographs, many showing underside as well as general view.

Plain Slides 1/3 each. Coloured Slides 2/6 each.

1 Agaricus albus.	15 Agaricus (Pleurotus) pantolencus.
2 Agaricus arvensis, L.S. and entire.	16 Agaricus (Tricholoma) patulus.
3 Agaricus campestris, gills.	17 Agaricus (Lepiota) rachodes.
4 Agaricus confuens.	18 Agaricus Rubescens.
5 Agaricus fascicularis.	19 Agaricus (Collybia) velutipes.
6 Agaricus (Mycena) galopoda, on acorn.	20 Agaricus rutilans.
7 Agaricus (Mycena) galericulatus, on dead oak.	21 Agaricus saponaceus.
8 Agaricus (Clitocybe) geotropus.	22 Agaricus saponaceus.
9 Agaricus (Clitocybe) lacatus.	23 Amanitopsis vaginata.
10 Agaricus Melleus, mycelium of.	24 Armillaria melleus.
11 Agaricus (Amanita) muscarius.	25 Baldinia concentrica.
12 Agaricus (Amanita) muscarius.	26 Boletus badius.
13 Agaricus (Amanita) phalloides.	27 Boletus bovinus.
14 Agaricus ostreatus, on poplar.	28 Boletus calopus.
	29 Boletus chrypenteron.

Carrying Boxes, with Rubber Packing and Leather Handles—See Cover.

Section BB 4—Fungi—Continued.

30 Boletus edulis (young).	95 Lepiota acute-squamosa.
31 Boletus elegans.	96 Lepiota amianthina.
32 Boletus scaber.	97 Lepiota procerus.
33 Boletus luteus.	98 Leuzites betulina.
34 Boletus variegatus.	99 Lycogala epidendrum.
35 Boletus subtomentosus.	100 Lycoperdon depressum.
36 Calocera viscosa.	101 Lycoperdon saccatum.
37 Cantharellus aurantiacus.	102 Lycoperdon perlatum.
38 Cantharellus cibarius.	103 Lycoperdon pyriforme.
39 Cladonia verticillaris.	104 Marasmius personatus.
40 Cladopus variabilis.	105 Marasmius orcadens.
41 Clavaria fastigiata.	106 Merulius lachrymans, gills, x 40. M
42 Clavaria inaequalis.	107 Morchella esculenta.
43 Clavaria rugosa.	108 Mycena galericulata.
44 Clavaria argillacea.	109 Nectria cinnabarina.
45 Clavaria vermicularis.	110 Ochrolechia tartarea.
46 Clitocybe cyathiformis.	111 Otypholoma spectabilis.
47 Clitocybe dictyopa.	112 Panmolutus leucophanes.
48 Clitocybe maxima.	113 Paxillus involutus, young.
49 Clitocybe clavipes.	114 Paxillus involutus, young and expanded.
50 Collybia platyphylla.	115 Peziza wilkommii.
51 Coprinus comatus, group.	116 Peziza vesiculosa.
52 Coprinus comatus, V.S. gills.	117 Peziza, V.S. spores. M
53 Cordiceps militaris, in grass.	118 Peziza badia.
54 Cordiceps caloceroides, in caterpillar.	119 Phallus impudicus.
55 Cordiceps militaris, in caterpillar.	120 Phallus impudicus, isolated.
56 Cordiceps Robertsii, on caterpillar.	121 Phallus impudicus, various stages.
57 Cortinarius cinnamomeus.	122 Phallus impudicus, long sect.
58 Crepidotus mollis.	123 Pleurotus ostreatus.
59 Crucibulum vulgare.	124 Pleurotus serotinus, in fallen alder.
60 Creaster hygrometricus.	125 Pluteus cervinus.
61 Daedalia quercina (under side).	126 Polyporus abietinus.
62 Daedalia quercina (top view).	127 Polyporus betulinus.
63 Entoloma grisea-cyaneum, var. rosea.	128 Polyporus salignus.
64 Exidia glandulosa, gelatinous.	129 Polyporus squamosus, on ash.
65 Fistulina hepatica.	130 Polyporus squamosus.
66 Gomphidius roseus.	131 Polyporus squamosus, on elm.
67 Hebeloma crustuliniformis.	132 Polyporus squamosus (under side).
68 Hebeloma fastibilla.	133 Polyporus versicolor.
69 Helvella crispa, under Beech.	134 Polyporus sulphureus.
70 Herniola auricula-judae (Jews ear).	135 Polyporus wynei.
71 Herniola polytricha.	136 Pholiota spectabilis.
72 Hygrophorus ceraceus.	137 Pluteus cervinus.
73 Hygrophorus coccineus.	138 Psalliota arvensis, entire.
74 Hygrophorus conicus.	139 Psalliota arvensis, section. M
75 Hygrophorus sciophanus.	140 Russula alutacea.
76 Hygrophorus unguinosus.	141 Russula nigricans.
77 Hygrophorus hypothecius.	142 Russula ochroleuca.
78 Hygrophorus pratensis.	143 Russula sanguinea.
79 Hygrophorus psittacinus.	144 Scleroderma vulgare.
80 Hygrophorus virgineus.	145 Scleroderma vulgare.
81 Hydnum repandum.	146 Stereum hirsutum.
82 Hypholoma fascicularis.	147 Stereum purpureum (on Cherry).
83 Hypholoma sublateritius.	148 Stropharia squamosa.
84 Hypholoma velutinum.	149 Stropharia ruginosa.
85 Hypholoma hydrophilus, on trunk	150 Tricholoma melaleuca.
86 Hypoxylon concentricum.	151 Tricholoma personata.
87 Lachnea coccinea (scarlet elf-cap).	152 Tricholoma sordida.
88 Lactarius deliciosus.	153 Tuber melanospora Truffle, T.S. Spores. M
89 Lactarius umbrinus.	154 Discomycetes, types of (Kerner). D
90 Lactarius rufus.	155 Fungi at Home (Kerner). D
91 Lactarius pallidus.	156 Fairy Rings in Meadow (Kerner). D
92 Lactarius subdulcis.	157 Xanthoria parietina. D
93 Leocarpus fragilis.	158 Xylaria hypoxylon, "Candle Snuff."
94 Leotia lubrica.	

Section BB 5—MICRO-FUNGI.

Chiefly photomicrographs from our own preparations.

(See also Fungous diseases of plants, Section BB 7.)

Plain Slides 1/3 each. Coloured, where suitable, 3/-

ZYCOMYCETES.

1 Mucor, Mycelium and Sporangia.	D
2 Mucor, Mycelium and Spores.	M
3 Mucor stolonifer, with zygospores.	M
4 Empusa musce in section of fly.	M
5 Empusa and Entomophthora (Kerner).	D

OOMYCETES.

11 Achlya, oosporangia.	M
12 Saprolegnia on Simulium Larva with Zoospores, x 25.	M

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

Section BB 5—Micro-Fungi—Continued.

13 Moulds, various (Kerner).	D	46 Coleosporium tussilaginis on Coltsfoot leaf, x 9.	M
14 Synchytrium mercurialis, V.S.	M	47 Coleosporium on Leaf Nipplewort, x 9.	M
<b>ASCOMYCETES.</b>			
20 Eurotium (Aspergillus) glaucus.	M	48 Gymnosporangium juniperium, Æcidium on Mountain Ash.	P
21 Penicillium glaucum, colony, x 6	M	49 Gymnosporangium on Juniper.	P
22 Penicillium glaucum, fruiting, x 40.	M	50 Gymnosporangium clavariiforme, Æcidium on Hawthorn	P
23 Ascomycetes, Types of (Kerner).	D	51 Gymnosporangium causing distortion in Hawthorn.	P
24 Saccharomyces cerevisiae (Yeast)	M	52 Polythrincium Trifolii on Clover.	M
25 Yeast, various forms.	D	53 Exobasidium Rhododendri.	P
26 Yeast, various forms.	D	54 Exobasidium vaccinii.	P
27 Mycotrichum chartarum, on paper.	M	55 Onygena equina, in hoof of horse	M
28 Teratomyces muscificus, from insect.	M	56 Uromyces aloes.	P
29 Chaetomium Costrichodes on Giraffe dung.	M	57 Melampsora populina, uredo-stage on leaf.	P
<b>BASIDIOMYCETES.</b>			
40 Ustilago marginalis on leaves of Bistort	P	58 Melampsora Rostrupii on Mercurialis.	M
41 Ustilago utriculosa, on Persicaria.	P	<b>FUNGI IMPERFECTI.</b>	
42 Puccinia phragmitis, on Reed.	P	69 Ringworm, Trichophyton tonsurans, x 25, on hair.	M
43 Pbragmidium (Bramble Brand) on Rose leaf, x 9.	M	70 Microspora furfur, on bran.	P
44 Coleosporium ochraceum on leaf.	P	71 Mycorrhiza, T.S. in root of Neottia, x 100 (endotrophic).	M
45 Coleosporium ochraceum on T.S. leaf, x 40.	M		

Section BB 6—MYXOMYCETES—SLIME FUNGI.

A new series of fine photographs by an expert.

1 Life Cycle of the Mycetozoa (Drawing).		21 Stemonitis ferruginea, on dead wood.	
2 Ceratiomyxa fruticulosa.		22 Comatricha nigra, Capillitium.	
3 Badhamia utricularis, Living Plasmodium on branch.		23 Comatricha nigra, discharging Spores.	
4 Badhamia utricularis, Living Plasmodium on Filter Paper.		24 Comatricha laxa, Capillitium.	
5 Badhamia utricularis, Plasmodium Fixed and Stained and Magnified.		25 Comatricha Typhoides, showing Columella.	
6 Badhamia utricularis, Sporangia broken, showing Lime Knots.		26 Comatricha Typhoides, lobing of protoplasm and nuclei dividing, highly magnified.	
7 Badhamia utricularis, Lime Knots in Capillitium.		27 Lamproderma atropisporum, Capillitium.	
8 Badhamia utricularis, Sporangia on dead wood.		28 Cribraria intricata, Capillitium.	
9 Badhamia rubiginosa, Spores isolated.		29 Tubifera ferruginosa, Æsthalia on Pine wood, 3 stages.	
10 Physarum didermoides, on old stem.		30 Reticularia Lycoperdon, maturing on Pine stump.	
11 Physarum compressum, on dead wood.		31 Lycogala flavo-fuscum on dead wood.	
12 Physarum gyrosum.		32 Lycogala epidendrum, Æsthalium and bursting Spores. Also a few Sporangia of Comatricha typhoides, on dead tree.	
13 Physarum sinuosum, on dead leaves.		33 Trichia varia, on dead wood.	
14 Physarum lateritium, on oak leaf.		34 Hemitrichia Vesparium, part of Capillitium showing spiral markings, x 200.	
15 Fuligo septica, on grass (Flowers of Tan).		35 Hemitrichia elevata, x 5.	
16 Lecocarpus fragilis, on Bramble leaves.		36 Arcyria denudata, on Moss.	
17 Diderma floriforme, White Plasmodium.		37 Arcyria nutans.	
18 Diderma floriforme developing, Sporangia just appearing.		38 Swarm Spores hatched out from Spores, highly magnified.	
19 Diderma floriforme, on Bramble.			
20 Didymium squamosum, on dead stem.			

FOR RECENT ADDITIONS } See Page 99

Section BB 7—FUNGIOUS DISEASES OF PLANTS.

A series of photographs and photomicrographs of diseases affecting plants of economic importance.—This series will be added to from time to time.

Plain Slides 1/3 each.

1 Plasmodiophora, Club Root, on roots of Cabbage.	P	4 Cystopus in Capsella, Sporangia, V.S.	M
2 Plasmodiophora in T.S. root Cabbage, x 250.	M	5 Cystopus in Capsella, Sporangia, V.S., x 500.	M
3 Cystopus on Capsella, general view.	P	6 Cystopus in Capsella, Pustule, V.S.	M
		7 Cystopus in Capsella, Oospores, V.S.	M

Lecture Lanterns in various patterns—See Catalogue F.

**Section BB 7—Fungous Diseases of Plants—Continued.**

**POTATO DISEASES.**

12	Potato plants infested with <i>Phytophthora infestans</i> .	P
13	Potato leaf injured by <i>Phytophthora infestans</i> .	P
14	<i>Phytophthora infestans</i> , spores in situ in leaf, $\times 27$ .	M
15	<i>Phytophthora infestans</i> , various stages.	D
16	<i>Phytophthora infestans</i> , in section of Tuber.	P
17	<i>Spongospora subterranea</i> , Corky Scab, on Potato Tubers.	P
18	<i>Spongospora subterranea</i> , T.S. Tuber Potato.	M
19	<i>Spongospora subterranea</i> , Epidermis burst by disease.	M
20	<i>Synchytrium endobioticum</i> , Black Scab, on Potato Tubers.	P
21	<i>Synchytrium endobioticum</i> , Black Scab, section of Nodule.	M
22	<i>Synchytrium endobioticum</i> , Black Scab, section highly magnified.	M
23	<i>Actinomyces</i> in Potato, $\times 500$ .	M

**DISEASES OF WHEAT AND OTHER CEREALS.**

29	<i>Ustilago</i> (Smut), stages of infection in ears of wheat.	P
30	<i>Ustilago</i> (Smut), spores, $\times 40$ .	M
31	<i>Tilletia tritici</i> (Bunt) in ears of wheat.	P
32	<i>Puccinia graminis</i> , <i>Æcidium</i> stage on <i>Berberis</i> leaf.	M
33	<i>Puccinia graminis</i> , V.S. <i>Æcidiospores</i> .	M

34	<i>Puccinia graminis</i> , V.S. <i>Uredospores</i> .	M
35	<i>Puccinia graminis</i> , V.S. <i>Teleutospores</i> .	M
36	Ergot of Rye, stages (Kerner).	D
37	Ergot on Spike of Marram Grass.	P
38	Ergot on Spike of <i>Elymus</i> .	P
39	<i>Claviceps purpurea</i> (Ergot) with <i>Perithecium</i> .	P
40	<i>Claviceps purpurea</i> , <i>Perithecium</i> V.S.	M
41	<i>Claviceps purpurea</i> , V.S. Spores enlarged.	M

**OTHER FUNGOUS DISEASES.**

52	<i>Diphodia lycopersici</i> in Tomato.	P
53	<i>Sclerotium apinosum</i> on Tomato Stem.	P
54	<i>Cladosporium fulvum</i> on plants of Tomato.	P
55	<i>Cladosporium fulvum</i> , Rust on Tomato Leaf.	P
56	<i>Puccinia malvacearum</i> on Hollyhock Leaf.	P
57	<i>Puccinia menthae</i> on Garden Mint, Healthy and Diseased.	P
58	<i>Rhytisma acerina</i> on Sycamore Leaf.	P
59	<i>Rhytisma acerina</i> , V.S. in Leaf.	P
60	<i>Peronospora viticola</i> , False Vine Mildew (Kerner).	D
61	<i>Sclerotinia fructigena</i> on Plum, V.S.	M
62	Apples with Scab.	P
63	Pear with <i>Botrytis</i> .	P
64	European Mildew in Gooseberries.	P
65	<i>Polyporus squamosus</i> on Ash.	P
66	<i>Phragmidium subcorticium</i> , <i>Uredospores</i> , on Rose.	M
67	<i>Phragmidium subcorticium</i> , <i>Teleutospores</i> , on Rose.	M
68	<i>Exoascus deformans</i> on Plum Leaf.	P

**Section BB 8—LICHENS.**

Plain Slides 1/3 each.

1	<i>Cladonia furcata</i> in nature.	P	9	<i>Lobaria amplissima</i> .	P
2	<i>Cladonia squamosa</i> on rock.	P	10	<i>Parmelia physoides</i> .	P
3	<i>Cladonia pyxidata</i> on rock.	P	11	<i>Parmelia</i> sp. from Tasmania.	P
4	<i>Cladonia rangiferina</i> , V.S. entire cup, $\times 20$ .	M	12	<i>Parmelia</i> , V.S. <i>apothecia</i> , $\times 40$ .	M
5	<i>Cladonia rangiferina</i> , V.S. <i>Soredia</i> , enlarged, $\times 100$ .	M	13	<i>Parmelia parietina</i> , V.S. showing <i>protococcus</i> , $\times 100$ .	M
6	<i>Collema</i> on Rock.	M	14	<i>Physcia</i> sp., V.S. <i>apothecia</i> .	M
7	<i>Daedalea quercina</i> .	P	15	<i>Peltigera canina</i> in nature.	P
8	<i>Lichena pygmaea</i> on marine rocks.	P	16	<i>Ramalina calcicaris</i> .	P
			17	<i>Ramalina cuspidata</i> .	M

**Section BB 9—HEPATIC & MOSSES.**

Plain Slides, principally photomicrographs, 1/3 each.

**HEPATIC.**

1	<i>Reboullia antheridia</i> .	M	19	<i>Pellia</i> , V.S. <i>Archegonia</i> .	M
2	<i>Reboullia archegonia</i> .	M	20	<i>Pellia</i> , L.S. <i>Sporogonium</i> , $\times 25$ .	M
3	<i>Conocephalus</i> , V.S. <i>Sporangium</i> .	M	21	<i>Frullania</i> , E. <i>Thallus</i> .	M
4	<i>Lunularia</i> .	P	22	<i>Jungermannia</i> sp. in nature.	P
5	<i>Lunularia</i> , thallus with gemma, surface view.	M			
6	<i>Lunularia</i> , V.S. <i>gemmae</i> , $\times 5\frac{1}{2}$ .	M			
7	<i>Marchantia</i> life cycle.	D			
8	<i>Marchantia polymorpha</i> in nature.	P			
9	<i>Marchantia gemmae</i> , surface view.	M			
10	<i>Marchantia gemmae</i> , V.S.	M			
11	<i>Marchantia antheridiophores</i> in nature.	P			
12	<i>Marchantia</i> group of <i>antheridiophores</i> , enlarged.	P			
13	<i>Marchantia</i> , V.S. <i>antheridiophore</i> , $\times 9$ .	M			
14	<i>Marchantia</i> , V.S. <i>antheridium</i> .	M			
15	<i>Marchantia</i> , V.S. <i>archegoniophore</i> .	M			
16	<i>Marchantia</i> , V.S. <i>Sporogonium</i> young.	M			
17	<i>Marchantia</i> , V.S. <i>Sporogonium</i> , $\times 30$ .	M			
18	<i>Anthoceros</i> , L.S. <i>Sporogonium</i> .	M			

**MOSSES.**

51	Young Moss plants, <i>protonema</i> with bulbs.	M
52	Young Moss plants, <i>protonema</i> with bulbs, another species.	M
53	<i>Sphacnum</i> , Life history.	D
54	<i>Sphagnum</i> .	P
55	<i>Sphagnum</i> , <i>antheridia</i> isolated.	M
56	<i>Sphagnum</i> , <i>archegonia</i> isolated.	M
57	<i>Sphagnum</i> , <i>capsule</i> , V.S.	M
58	<i>Funaria hygrometrica</i> in nature.	P
59	<i>Funaria</i> , V.S. <i>antheridia</i> .	M
60	<i>Funaria</i> , V.S. <i>archegonia</i> .	M
61	<i>Funaria</i> , L.S. <i>sporogonium</i> .	M
62	<i>Funaria</i> , L.S. <i>sporogonium</i> .	M
63	<i>Schistoclea</i> , Cavern Moss.	M

Storage Cabinets for Slides in all sizes—See Cover.



**Section BB 9—Hepatics and Mosses—Continued.**

64 Leptobryum, bulbils on rootlets and leaf axils. x 36.	M	69 Polytrichum formosum in nature, Antheridia and sporogonia.	P
65 Mnium undulatum.	P	70 Polytrichum commune, with sporogonia.	P
66 Mnium, T.S. Stem, origin of rhizoids, x 80.	M	71 Polytrichum, T.S. Stem, x 80.	M
67 Polytrichum, life cycle.	D	72 Polytrichum, T.S. Leaf.	M
68 Polytrichum aloides, with sporogonia.	P	73 Polytrichum, L.S. Antheridia.	M
		74 Polytrichum, T.S. Antheridia, x 55.	M

**Section BB 10—PTERIDOPHYTA.**

Ferns, Horsetails, Lycopods, etc., arranged after the "London Catalogue," Tenth Edition. Many are photographs of the plants in situ.

Plain Slides 1/3 each. Coloured, where suitable, 3/- each.

A large variety of Greenhouse Ferns are available as Slides.—List on application.

**FILICES—FERNS.**

1 Life Cycle of Fern.	D
2 Alternation of Generation in Ferns.	D
3 Various forms of Ferns (Kerner).	D
4 Adiantum Capillis-Veneris, Maidenhair Fern.	P
5 Adiantum, Prothallus, three stages.	M
6 Adiantum, Prothallus, with first frond.	M
7 Adiantum Aspidium (Lastrea) and Pteris-Pinna.	P
8 Pteris aquilina, Field of Bracken.	P
9 Pteris aquilina, group.	P
10 Pteris aquilina, Pinna with sori, x 2.	M
11 Pteris, T.S. Rachis.	M
12 Pteris, T.S. Stele, larger.	M
13 Pteris, L.S. Scalariform vessels in Stele.	M
14 Cryptogramme crispa, Parsley Fern.	P
15 Blechnum Spicant.	P
16 Asplenium lanceolatum on Wall.	P
17 Asplenium Trichomanes on Wall.	P
18 Asplenium Ruta-mararia, Wall Spleenwort.	P
19 Asplenium huliferum, frond, Apospory.	P
20 Athyrium Felix-femina, Lady Fern.	P
21 Ceterach officinalis, fronds.	P
22 Scolopendrium vulgare, Hartstongue.	P
23 Scolopendrium, V.S. young sporangia.	M
24 Scolopendrium, V.S. older sporangia.	M
25 Cystopteris fragilis and Asplenium Trichomanes on cliff.	M
26 Polystichum Lonchitis, fronds.	P
27 Lastrea Montana, Mountain Fern.	P
28 Lastrea Filix-mas, Male Fern, anatomy.	D
29 Lastrea Filix-mas, Male Fern, in nature.	P
30 Lastrea Filix-mas, frond unfolding.	P
31 Lastrea Filix-mas, Pinna with sori.	P
32 Lastrea Filix-mas, V.S. Sporangium, x 10.	M
33 Polypodium vulgare, on wall.	P
34 Polypodium vulgare, on stump of tree.	P
35 Phegopteris Dryopteris, Oak Fern.	P
36 Phegopteris polypodioides, Beech Fern.	P
37 Gymnogramme, Prothallus with antheridia and archegonia.	M
38 Gymnogramme Prothallus, developing embryo.	M
39 Gymnogramme Prothallus, embryo, older.	M
40 Gymnogramme Prothallus, V.S. Antheridia.	M
41 Gymnogramme Prothallus, V.S. Archegonia.	M
42 Gymnogramme, Pinna with sori.	M
43 Ophioglossum vulgatum, Adder's Tongue.	P
44 Ophioglossum, V.S. Sporangia.	M
45 Botrychium Lunaria, Moonwort in Nature.	P
46 Botrychium Lunaria, with rootlets.	P

**EQUISETACEÆ—HORSETAILS.**

57 Equisetum maximum, group.	P
58 Equisetum Arvense, group of Fertile Spikes in nature.	P
59 Equisetum, new spike growing through old stem.	P
60 Equisetum, Three Abnormal Fertile Spikes.	P
61 Equisetum, T.S. stem.	M
62 Equisetum, T.S. Meristem tissue, x 60.	M
63 Equisetum, L.S. Vegetative Bud.	M
64 Equisetum, V.S. Apical Cell.	M
65 Equisetum, T.S. Strobilus.	M
66 Equisetum, Spores with elaters, x 80.	M

**LYCOPODIACEÆ—CLUB MOSSES.**

72 Lycopodium Selago, Fir Club Moss in nature.	P
73 Lycopodium clavatum, Club Moss in nature.	P
74 Lycopodium complanatum in fruit.	P
75 Lycopodium, T.S. stem.	M
76 Lycopodium Selago, V.S. Strobilus.	M
77 Lycopodium Selago, V.S. Strobilus, larger.	M

**SELAGINELLACEÆ.**

83 Selaginella, Life Cycle.	D
84 Selaginella Willdenovii, T.S. Polystelic stem.	M
85 Selaginella Kraussiana, T.S. Monostelic stem.	M
86 Selaginella, sporophyll with Micro. and Mega spores.	M
87 Selaginella, V.S. Megaspore with Prothallus and Archegonia, x 100.	M
88 Isoetes lacustris, Quillwort.	D
89 Isoetes lacustris.	P
90 Psilotum triquetrum, branch with sporogonia.	P
91 Psilotum, T.S. Rachis, x 40.	M
92 Psilotum, T.S. Sporangium, x 20.	M

**MARSILEACEÆ.**

97 Marsilea and Pilularia.	D
98 Pilularia, V.S. Sporangium, x 9.	P
99 Marsilea salvatrrix.	M
100 Marsilea, V.S. Archegonia.	M
101 Salvinia natans.	D

**VARIOUS.**

107 Group of Tree Ferns, New Zealand.	P
108 Gleichenia dicarpa fronds.	P
109 Platycerium Willinkii, Staghorn Fern.	P
110 Dunatedia, V.S. Sorus.	M
111 Woodwardia Prothallus, three stages.	M

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

**Section BB 11—ROOT STRUCTURE.**

Plain Slides 1/3 each. Coloured, where suitable, 3/- each.

1 Ricinus communis, young seedlings.	P	25 Ficus repens, clinging roots.	P
2 Faba vulgaris, Bean, young seedling.	P	27 Sand dunes, kept together by roots of Marram Grass.	M
3 Ash seedling, showing cotyledons.	P		
4 Beech seedling, showing cotyledons.	P		
5 Sycamore seedling, showing cotyledons.	P		
6 Hawthorn seedlings, showing cotyledons.	P		
7 Galeopsis seedlings, showing cotyledons.	P		
9 Tamus, very young seedling.	P		
10 Tamus, older, showing single cotyledon.	P		
11 Tamus rhizome.	P		
12 Bryonia dioica, root and young stem.	P		
13 Mandragora, entire root.	P		
14 Snowflake, tunicated bulb.	P		
15 Arum, young plant with roots.	P		
16 Garlic, tubers and roots.	P		
18 Hyacinth, three seedlings showing soil particles on root hairs.	P		
19 Hyacinth, young plants with bulbs and roots, various.	P		
20 Orchis (Philodendron), showing aerial roots.	D		
21 Roots of orchis, growing in glass jar.	P		
22 Beech roots penetrating into sandstone.	P		
22a Larch roots on rocks.	P		
23 Ivy, clinging roots.	P		
24 Ivy, T.S. stem and L.S. adventitious roots.	M		

**PHOTOMICROGRAPHS.**

28 Hordeum, T.S. grain, developing radicles.	M
29 Hordeum, T.S. root, one radicle enlarged.	M
30 Hordeum, young root showing root cap.	M
31 Zea Mais, T.S. root.	M
32 Acorus Calamus, T.S. root x 69.	M
33 Allium, L.S. root tip.	M
34 Allium, L.S. root, karyokinesis.	M
35 Dendrobium, T.S., entire arial root.	M
36 Dendrobium (Orchid), T.S. arial root, central axis, x 49.	M
37 Ranunculus acris, T.S. root.	M
38 Helianthus, T.S. root, x 25.	M
40 Ampelopsis, T.S. root.	M
41 Cucumis, T.S. root.	M
42 Rheum, T.S. root showing crystals.	M
43 Crystals, isolated from Rheum.	M
44 Taraxacum, Inulin crystals in L.S. root.	M
45 Taraxacum, T.S. root.	M
46 Pinus, T.S., root.	M
47 Pteris rhizome, L.S. apex.	M
48 Aspidium, T.S. rootlet.	M
49 Aspidium, apical cell in L.S. rootlet.	M

**Section BB 12—STEM STRUCTURE.**

Plain Slides 1/3 each. Coloured, where suitable, 3/- each.

**GYMNOSPERMS AND CRYPTOGAMS.**

1 Pinus, L.S. stem apex showing mitosis.	M
2 Pinus, T.S. young stem.	M
3 Pinus, T.S. young stem and developing branch.	M
4 Pinus, T.S. old wood, annual rings.	M
5 Pinus, L.S. (radial), bordered pits.	M
6 Pinus, L.S. (tangential), bordered pits in T.S.	M
7 Pinus, stem structure, cube, diagram.	D
8 Ginkgo, T.S. stem.	M
9 Casuarina, T.S. stem, with stomata.	M
10 Pteris, T.S. rachis.	M
11 Pteris, T.S. scalariform vessels.	M
12 Pteris, L.S., scalariform vessels.	M
13 Equisetum, T.S. stem.	M
14 Equisetum, L.S. vegetative bud.	M
15 Equisetum, T.S. meristem tissue, x 100.	M
16 Selaginella, T.S. stem.	M
17 Lycopodium, T.S. stem.	M
18 Cycas media, T.S. stem.	M

**MONOCOTYLEDONOUS STEMS.**

19 Dracena (Cordylina) rubra, T.S.	M
20 Ruscus, T.S. typical monocot. stem.	M
21 Zea Mais, T.S. vascular bundle.	M
22 Zea Mais, L.S. annular vessels.	M
23 Pandanus Veitchii, T.S. stem.	M
25 Tamus communis, T.S. stem.	M
26 Triticum, T.S. stem, usual, hollow.	M
27 Triticum, T.S. solid stem.	M
28 Triticum, L.S. solid stem.	M

**DICOTYLEDONOUS STEMS.**

29 Faba, T.S. hypocotyl.	M
30 Cucumis, T.S. stem.	M
31 Cucumis, T.S. vasc. bundle, sieve-tubes.	M
32 Cucumis, L.S. vasc. bundle, sieve-tubes.	M
33 Cytisus Scoparius, T.S. stem.	M

34 Helianthus, L.S. stem.	M
35 Helianthus annuus, T.S. stem.	M
36 Cheiranthus, T.S. stem.	M
37 Trifolium sp., T.S. stem.	M
38 Lilac, T.S. young stem, lenticels.	M
39 Maple, T.S. twig.	M
40 Sycamore, L.S. twig.	M
41 Alder, T.S. twig.	M
42 Wych elm, T.S. twig.	M
43 Willow, T.S. twig.	M
44 Stachys, square stem, T.S.	M
45 Cuscuta on clover, T.S.	M

**STEMS OF AQUATIC PLANTS.**

46 Hippuris, T.S. stem.	M
46a Hippuris, V.S. stem apex.	M
47 Menyanthes, T.S. stem.	M
48 Cyperus longus, T.S. triangle stem.	M
49 Juncus, T.S. stem.	M
50 Lymanthenum, T.S. stem.	M

**STEMS OF CLIMBING PLANTS.**

51 Humulus lupulus, T.S. stem.	M
52 Convolvulus arvensis, T.S. stem.	M
53 Clematis Vitalba, T.S. stem.	M
54 Aristolochia, T.S. stem.	M
55 Ampelopsis, T.S. stem.	M
56 Piper nigrum, T.S. stem.	M
57 Liana, from Brazil, T.S. stem.	M
58 Liana, from Brazil, T.S. stem.	M

**VARIOUS.**

59 Girder formation in T.S., various stems.	D
60 Secondary Girder formation in T.S., various stems.	D
61 Diagrammatic representation of Girders.	D
62 Ribbed-like stems of Lianas.	D
63 Twisted stems of Lianas.	D
64 Branch of leafy tree in T. and L.S. (Kerner).	D

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

**Section BB 13—LEAVES AND LEAF STRUCTURE.**

Plain Slides 1/3 each. Coloured, where suitable, 3/- each.

1	Forms of leaves, various.	P	67	Epidermal cells, Mistletoe (stomata).	M
2	Forms of leaves, simple.	P	68	Folding of moss leaves.	D
3	Forms of leaves, compound.	P	69	Folding of grass leaves.	D
4	Holly, spiny and smooth.	P	70	Folding of grass leaves.	D
5	Plants with leaf-like branches.	D	71	Transpiring cells, Marchantia.	P
6	Furze, modified leaves.	P	72	Rolled leaves, T.S.	D
7	Leaf of lattice plant.	P	73	Stellate hairs, Solanum.	M
8	Leaf arrangement, Pinus cembra.	P	74	Elaeagnus, epidermal hairs.	M
9	Leaf arrangement, Abies sp.	P	75	Rhamnus, upper and lower epidermis hairs.	M
10	Leaf arrangement, Abies pinsapo.	P	76	Alyssum, branched hairs.	M
11	Leaf arrangement, Thuja.	P	77	Lithospermum, simple hairs.	M
12	Perfoliate leaves of Chlora.	P	78	Deutzia, stellate hairs.	M
13	Leaf-like petioles, Lathyrus nissolia.	P	79	Onosma, stellate hairs.	M
14	Rhododendron leaves, stellate arrangement.	P	80	Pomaderris stellate hairs.	M
15	Radical leaves, Saxifraga umbrosa.	P	81	Rhododendron, scales.	M
16	Oxalis acetosella, day condition.	P	82	Nettle, stinging hairs	M
17	Oxalis acetosella, night condition.	P	83	Leaf fall in Horse-chestnut.	D
18	Mimosa, day and night condition.	D	84	Leaf fall in Sycamore, L.S. stem.	M
19	Compound leaves, day and night condition.	D	85	Leaf bud, Sycamore, T.S.	M
20	Hedysarum, day and night condition.	D	86	Leaf bud, Lilac, T.S.	M
21	Leaf mosaic, maple, lateral branch.	P	87	Leaf bud, Ash, T.S.	M
22	Leaf mosaic, maple, erect twig.	D	88	Leaf bud, Hazel, T.S.	M
23	Leaf mosaic, lateral branch.	D	89	Leaf bud, Frog-bit, T.S.	M
24	Leaf mosaic, various.	D	90	Leaf, Sunflower, T.S., x 25.	M
25	Leaf mosaic, lengthened petioles.	D	91	Leaf, Holly, T.S.	M
26	Leaf mosaic, ground ivy.	P	92	Leaf, Cypripedium, T.S.	M
27	Leaf mosaic, unequal sizes.	D	93	Leaf, N w Zealand flax, T.S.	M
28	Leaf mosaic, unequal sizes.	D	94	Leaf, Nerium oleander, T.S.	M
29	Action of light in leaves, Lemna.	D	95	Leaf, Ficus elastica, T.S. (midrib).	M
30	Protoplasm in cells, Vallisneria.	D	96	Leaf, Ficus elastica, T.S. (cystoliths).	M
31	Forms of weapons in plants.	D	97	Leaf, Rosemary, T.S.	M
32	Forms of weapons in plants.	D	98	Leaf Pipus, T.S.	M
33	Frog-bit winter buds becoming detached.	D	99	Leaf Roehia falcata, flinty armour, T.S.	M
34	Frog-bit winter buds rising to surface.	D	100	Outicle, Roehia falcata, flinty armour, x 9.	M
35	Circulation in plants.	D	101	Leaf, Ammophila (Marram grass), T.S. 2/.	M
36	Transpiration in plants.	D	102	Leaf, Elymus arenarius, T.S.	2/.
37	Transpiration in plants.	D	102a	Leaf Elymus arenarius, T.S., part enlarged.	M
38	Exp. to show root pressure.	D	103	Leaf Andromeda polyfolia, T.S.	M
39	Exp. to show osmosis.	D	104	Petiole, Cycas, T.S.	M
40	Centrifugal and centripetal transmission of water.	D	105	Scutellum, vegetative bud, L.S.	M
41	Teasel to show water receptacles.	P	106	Equisetum, vegetative bud, T.S.	M
42	Absorption of water by leaves.	D	107	Cereus, raphides in leaf.	M
43	Absorptive cavities and cups in leaves.	D	108	Stomata, in surface view, Eucalyptus, epidermal cells.	M
44	Leaves and hairs to retain dew.	D	109	Ficus indica, entire leaves, back and front view.	P
45	Compass plants.	D	110	Molinia caerulea, T.S. leaf in wet and dry condition.	M
46	Venation in leaf blades.	D	111	Eriophorum angustifolium, leaf, T.S.	M
47	Venation in leaf blades.	D	112	Comfrey leaf, epidermal hairs, surface view.	M
48	Balsam, branch, showing glands.	D	113	Section of leaf showing lenticular epidermal cells.	M
49	Balsam, leaf showing glands.	D	114	Photo taken through epidermal cells. Multiple images.	M
50	Viburnum branch with glands.	D	115	Stoma in vertical section, Sunflower leaf.	M
51	Viburnum leaf with glands.	D	116	Stoma, surface view, Sunflower leaf.	M
52	Acacia leaf with glands.	D	117	Privet, Leafy Branch Ending.	P
53	Branch of cherry with glands.	D	118	Erica, T.S. leaf.	M
54	Leaf of cherry with glands.	D	119	Prunus, T.S. leaf.	M
55	Tendrils in Bryony.	D	120	Saxifraga, L.S. Water stoma.	M
56	Light-avoiding tendrils.	D	121	Nuphar, T.S. Petiole Idioblast.	M
57	Branch tendrils of Serjania.	D	122	Lilium, Epidermal cells and stomata, x 100.	M
58	Leaf-stalk tendril, Atragene.	D	123	Leaf fall, Rhus.	M
59	Stipular tendrils of Smilax.	D	124	Leaves Aristolochia.	P
60	Tendrils of pea.	P			
61	Stoma in leaf of bean.	D			
62	Protection of stomata by cuticular pegs.	D			
63	Stomata of orchid in hollow tubercles.	D			
64	Forms of stomata.	D			
65	Cycas, T.S. leaf (stomata).	M			
66	Epidermal cells, Araucaria (stomata).	M			

All Slides may be had Plain—unless otherwise stated.

P—Photograph. E—Drawing or Diagram. M—Photomicrograph T.S.—Transverse Section  
L.S.—Longitudinal Section

**Section BB 14—FLORAL STRUCTURE.**

Plain Slides, principally photomicrographs, 1/3 each.

1 Diagram of simple flower, L.S.	D	20 Lillium croceum, T.S. flower bud.	M
2 Bignonia sp., T.S. flower bud.	M	21 Arum, T.S. stamens.	M
3 Cheiranthus, T.S. flower bud.	M	22 Arum, T.S. ovaries.	M
4 Brassica, T.S. flower bud.	M	23 Pinus, pollen grains.	M
5 Clematis, T.S. flower bud.	M	24 Pinus, L.S. male cone.	M
6 Hypericum, T.S. flower bud.	M	25 Eschscholtzia, pollen grains.	M
7 Passiflora, T.S. flower bud.	M	26 Lillium, pollen grains.	M
8 Atropa, T.S. flower bud.	M	27 Sparmannia, anthers.	M
9 Lasiandra, T.S. inflor. scence.	M	28 Monadelphous stamens, Abutilon.	P
10 Menyanthes, T.S. flower bud.	M	29 Syngenedicous stamens, Gloxinia.	P
11 Eschscholtzia, T.S. flower bud.	M	30 Malva, anthers and stigma.	P
12 Eschscholtzia, L.S. stigma.	M	31 Eucalyptus, flowers.	P
13 Helianthus, V.S. capitulum.	M	32 Hypo-, epi-, and perigynous flowers, L.S.	D
14 Taraxacum, T.S. capitulum.	M	33 Digitalis, T.S. ovary.	M
15 Taraxacum, L.S. capitulum.	M	34 Digitalis, T. and L.S. ovary.	M
16 Nymphæa, L.S. flower bud.	M	35 Pyrola, T.S. ovary.	M
17 Nymphæa, transition from stamens to petals.	P	36 Papaver, T.S. ovary.	M
18 Tulip, T.S. flower bud.	M	37 Gymnosperm ovule.	D
19 Iris, T.S. flower bud.	M	38 Polycotyledonous embryo, Pinus T.S.	M
		39 Fasciated peduncle of Dandelion, 2 flowers.	P

**Section BB 15—POLLINATION AND FERTILIZATION OF FLOWERS.**

Chiefly from Kerner and Oliver's Natural History of Plants. Those marked P are photographs, M photomicrographs.

Plain Slides 1/3 each. Coloured, where suitable, 2/6 each.

1 Eschscholtzia Stigma, L.S., showing pollen tubes.	M	39 Clerodendron Thompsonia, receptive and un-receptive flowers.	
2 Wheat stigma, entire, pollen grains and tubes.	M	40 Scrophularia nodosa, receptive and un-receptive flowers.	
3 Wheat stigma, entire, pollen tubes passing down stigma.	M	41 Anatomy of flowers of Robinia hispida.	
4 Development of pollen tube in stigma.		42 Anatomy of flowers of Phaseolus.	
5 Course of pollen tube in rock rose.		43 Anatomy of flowers of Sage and Salvia.	
6-7 Forms of pollen grains.		44 Anatomy of flowers of Pansy.	
8 Pollen grains united by threads of viscin.		45 Plantanthera habeneria, Orchis.	
9 Pollen grain of Epifobium, emitting pollen grain.		46 Anagracum sesquipedale, long-spurred flower.	P
10 Forms of stigmas.		47 The pencil experiment, extraction of pollinia.	
11 Entire stigma of Datura.		48 Fertilisation of Epipactis palustris	
12 Stigma of Ratura, in Long Section.		49 Fertilisation of Orchis mascula.	
13 Forms of stamens.		50 Expulsive apparatus in orchis flowers.	
14 Forms of stamens.		51 Deposition of pollen on humming bird by male flower of Macgravia nepenthoides.	
15 Forms of stamens.		52 Head of Humming Bird and Flower of Datura.	
16 Forms of union in stamens.		53 Fertilisation of Aristolochia.	
17 Stamens of double and monstrous flowers.		54 Aristolochia, before and after fertilisation.	
18 Forms of ovaries.		55 Capitula of Serratula protected by ants.	
19 Forms of ovaries.		56 Floral structure of Epilobium angustifolium.	
20 Forms of placentation.		57 Lythrum salicaria, trimorphic flowers.	
21 Forms of nectaries.		58 Fertilisation of Cowslip and pansy.	
22 Diagram to illustrate dimorphism.		59 Mitchella repens, Partridge Berry, receptive and non-receptive flowers.	
23 Diagram to illustrate trimorphism.		60 Mitchella repens, Partridge Berry, L.S. flowers.	
24 Diagram to illustrate autogamy.		61 Fertilisation of Crucnella and Spartium.	
25 Head of Sphinx with pollinia attached.		62 Transportation of pollen by egg-laying insects.	
26 Anatomy of butterfly's head.		63 Deposition of pollen by Mimulus luteus.	
27 Pollen baskets on hind legs of bees.		64 Sticky-glands as a protection to flowers, Tinnea borealis.	
28 Beetles that fertilise flowers.		65 Anatomy of flower of Aristolochia	
29 Arrangements for reception of insects.		66 Male and female flowers of the oak.	P
30 Crucinella stilosa, dispersion of pollen.		67 Male and female flowers of the elm.	P
31 Contrivances for deposition of pollen on insect visitors.		68 Male and female flowers of the alder.	P
32 Contrivances for deposition of pollen, as illustrated by acanthus.		69 Male and female flowers of the hazel.	P
33 Hairs as a-protection of flowers.		70 Male and female flowers of the willow.	P
34 Fertilisation of Salvia and Twayblade.			
35 Anatomy of Salvia.			
36 Contrivances for excluding insects.			
37 Honey-guides on corollas of flowers.			
38 Flowers of Kalmia latifolia, position of stamens			

Slides Toned to an Artistic Brown Shade cost 6d. each, or 4/6 per dozen extra.

**Section BB 14—Pollination and Fertilization of Flowers—Continued.**

71 Fertilization of <i>Avena elatior</i> , grass.	103 Completely dichogamous flowers.
72 Upright and drooping condition of flowers of <i>Cytisus laburnum</i> .	104 Arrangements for retention of deposited pollen.
73 Pollen dispersion, <i>Pinus pumilio</i> .	105 Concealment of honey.
74 Pollen dispersion, <i>Taxus baccata</i> .	106 Nectaries.
75 Male and female flowers of Mulberry.	107 <i>Cornus florida</i> ; attractive organs and alighting platforms for insects.
76 Male and female flowers of Walnut.	108 Concealment of honey.
77 <i>Silene nutans</i> , Catchfly, day condition.	109 Sprinkling apparatus.
78 <i>Silene nutans</i> , Catchfly, night condition.	110 Sprinkling apparatus.
79 Fertilization of <i>Potamogeton crispus</i> .	111 Autogamy effected through infection of the style-branches.
80 Fertilization of <i>Vallisneria spiralis</i> .	112 Explosive apparatus in papilionaceous flower.
81 Flowers of <i>Vallisneria spiralis</i> .	113 Change of position of anthers and stigmas.
82 Protection of pollen in <i>Carlina acaulis</i> .	114 Clip mechanism for fastening the pollinia of <i>Asclepias cornuti</i> to the feet of insects.
83 Protection of pollen in <i>Crocus multifidus</i> .	115 Transference of pollen to the bodies of insects.
84 Autogamy by infection of peduncle and folding of corolla.	116 Apparatus for pumping pollen on bodies of insects.
85 Autogamy by infection of peduncle and spiral torsion of filaments.	117 Fertilization in <i>Gymnosperm</i> and in <i>Ornithogalum</i> .
86 Autogamy of inclination of curved stamens.	118 Embryo sac of <i>Monotropa</i> .
87 Autogamy of inclination of stamens.	119 Fertilization of ovule in Hornbeam.
88 Autogamy of elongation of pistil.	120 Pollen of Mallow. M
89 Autogamy of by means of infection of style.	121 Primrose flowers, showing dimorphism. P
90 Autogamy in willow herb.	122 Abutilon: monadelphous stamens. P
91 Autogamy by spiral twisting of stamens and style.	123 <i>Hibiscus schizopetalus</i> , elongated hanging filament. P
92 Autogamy by crossing of the style-branches, composite.	124 <i>Gloxinia</i> , syngenesious anthers. P
93 Autogamy effected by the petals.	125 <i>Ginkgo Ovary</i> , V.S. M
94 Autogamy effected by means of corolla.	126 Fly; <i>Pyropheria granditarsis</i> with <i>Orchis</i> pollinia on head. P
95 Autogamy effected by means of corolla.	126a Fly's Head with <i>Orchis</i> pollinia, enlarged. P
96 Autogamy effected by infection of peduncle and filaments.	127 <i>Staphelia</i> , Star-fish flower, 14 in. dia. P
97 Autogamy effected by infection of peduncle and disarticulation of corolla.	128 <i>Staphelia</i> , central part of flower, with Blowfly maggots in situ. P
98 Autogamy resulting from infection of peduncle.	129 Bird of Paradise flower, <i>Strelitzia</i> . P
99 <i>Erica tetralix</i> , dissected flower.	130 Bird of Paradise flower, near view. P
100 <i>Kalmia latifolia</i> .	131 <i>Ceropedia</i> , Umbrella Flower. P
101 Humming bird and Hawk moth.	
102 <i>Arum conocephaloides</i> , with front of spathe removed.	

**Section BB 16—FRUITS AND SEEDS.**

Plain Slides 1/3 each.

**SEED DISPERSION.**

1 Winged fruits and seeds, wind dispersion. P
2 Dispersion of fruits and seeds by wind. D
3 Dispersion of fruits and seeds by wind. D
4 Dispersion of fruits and seeds by wind. D
4a Forms of Capsular and winged fruits.

**PLUMED FRUITS AND SEEDS.**

5 Pappus fruits of <i>Tragopogon</i> , wind dispersal. P
6 Pappus fruits of <i>Ceropegia</i> . P
7 <i>Calotropis</i> (silk cotton) pod and hairy seeds. P
8 <i>Asclepius</i> , pod and plumed seeds. P
9 <i>Physianthus</i> pod and plumed seeds. P
10 <i>Clematis</i> (plumed fruits). P
11 <i>Leucadendron argenteum</i> , silver leaf. P
12 <i>Protea mellifera</i> . P

**WINGED FRUITS AND SEEDS.**

13 Various winged fruits and seeds. P
14 <i>Rumex</i> flowers and fruit. D
15 <i>Aspidosperma</i> sp., winged seeds. P
16 <i>Tecoma australis</i> , pod and winged seeds. P
17 <i>Calosanthus</i> , large winged seeds. P
18 Various winged seeds. D
19 <i>Palinurus aculeatus</i> , winged fruits. P
20 <i>Pterospermum</i> , winged seeds. P
21 <i>Casuarina equisetifolia</i> , shee oak. P

22 <i>Hakea pectinata</i> (wooden cherry). P
23 <i>Aristolochia</i> (birthwort). P
24 <i>Begonia</i> . P
25 <i>Cedrela odorata</i> . P
26 <i>Pinus muricata</i> (persistent cones). P
27 <i>Pinus pinea</i> (edible pine) cone. P
28 <i>Pinus longifolia</i> , cone. P
29 <i>Picea nigra</i> , cone. P
30 <i>Cedrus libani</i> , cone. P
31 <i>Araucaria</i> , fruit and seeds. P
32 <i>Ginkgo biloba</i> , seeds. P
33 Coniferous fruits and seeds, various. D

**EXPLOSIVE, HOOKED, &c., FRUITS AND SEEDS.**

34 Creeping and hopping fruits, various. D
35 Various fruits, etc., including sling fruits. P
36 Catapult fruits, various. D
37 <i>Ricinus</i> (castor oil), explosive fruits. P
38 <i>Hura crepitans</i> , explosive fruits. P
39 Sling fruits, various. D
40 Shooting or sling fruits, various. D
41 Fruits with needle-like spines. D
42 Spinous fruits, various. D
43 <i>Pterocarpus</i> , spiny, winged fruit. P
44 Sticky fruits, various. D
45 Fruits with hooks. D

Storage Cabinets for Slides in all sizes—See Cover.

## Section BB 16—Fruits and Seeds—Continued.

46 Fruits with books.	D	75 <i>Illicium anisatum</i> , star anise.	P
47 Hooked fruits and seeds, various.	P	76 <i>Helecteres leona</i> (twisted fruit).	P
48 <i>Trapa</i> (water chestnut), hooked.	P	77 <i>Adansonia digitata</i> baobab.	P
49 <i>Trapa bicornis</i> , hooked.	P	78 <i>Hibiscus esculenta</i> .	P
50 <i>Trapa bicornis</i> , anchoring.	P	79 <i>Eucalyptus globulus</i> .	P
51 <i>Martynia</i> sp., hoened fruit.	P	80 <i>Calamus spectabilis</i> (rattan cane).	P
52 <i>Harpagophytum</i> , hooked fruit.	P	81 Wet and dry conditions, fruit, <i>Tragopogon</i> .	P
<b>LEGUMINOUS FRUITS AND SEEDS.</b>			
53 Various leguminous fruits and seeds.	P	82 <i>Anastatica</i> (resurrection plant), wet and dry.	D
54 <i>Medicago echinus</i> , growing.	P	83 Protection of seeds against wet.	D
55 <i>Medicago echinus</i> , flowers and fruit.	P	84 Protection of seeds against wet.	D
56 <i>Mucuna hexandra</i> (hairy).	P	85 Protection of seeds against animals.	D
57 <i>Mimosa</i> , sensitive.	P	86 Protection of seeds against animals.	D
58 <i>Scorpiurus vermiculata</i> (caterpillar fruits).	P	87 <i>Euphorbia exigua</i> , enlarged.	P
59 <i>Acacia arabica</i> (Lomentum).	P	88 <i>Hyoscyamus niger</i> , enlarged.	P
60 <i>Acacia sphaerocephala</i> , ant sheltering plant, spines, and fruit.	P	89 <i>Silene pendula</i> , enlarged.	P
61 <i>Alzella euanzensis</i> .	P	90 <i>Spergularia marina</i> , enlarged.	P
<b>MISCELLANEOUS.</b>			
62 Collective and aggregate fruits.	D	91 <i>Nemesia</i> sp., enlarged.	F
63 Capsular fruits.	D	92 <i>Capsella</i> (shepherd's purse), L.S., x 9.	M
64 <i>Viola</i> fruit and leaves.	P	93 Sunflower, L.S. seed, x 35.	M
65 <i>Nicandra physaloides</i> , accrescent calyx.	P	94 Date fruit (young), T.S., x 6.	M
65 <i>Physalis</i> (Chinese lanterns), accrescent calyx.	P	<b>PHOTOMICROGRAPHS.</b>	
67 <i>Ipomea chrysantha</i> , accrescent calyx.	P	95 Fig, young fruit, L.S., x 3.	M
68 <i>Sapindi</i> sp., monkey pot.	P	96 <i>Ethusa cynapium</i> , T.S. cremocarp.	M
69 <i>Nelumbium</i> , lotus lily (in lake).	D	97 <i>Fœniculum</i> , T.S. cremocarp.	M
70 <i>Nelumbium</i> , lotus lily, fruit.	D	98 <i>Smyrniolum</i> , T.S. cremocarp.	M
71 <i>Nigella damascena</i> .	P	99 <i>Capsicum</i> , L.S. seed, showing embryo.	M
72 <i>Metrodorea atropurpurea</i> .	P	100 <i>Cubeb</i> , T.S. fruit.	M
73 <i>Juglans americana</i> .	P	101 Ivy, fruit, T.S.	M
74 <i>Areca catechu</i> .	P	102 Holly, fruit, T.S.	M
		103 Cucumber, T.S. fruit (young).	M
		104 <i>Pinus</i> , T.S. seed ( <i>Polycotyledonous</i> ).	M

## Section BB 17—PLANT EMBRYOLOGY and FERTILIZATION.

A series of selected photomicrographs.

Plain Slides only 1/6 each.

1 <i>Fritillaria</i> , embryo-sac, mitosis, reduction division, 12 chromosomes.		21 <i>Lilium</i> Embryo sac, splitting of chromosomes.	M
2 <i>Fritillaria</i> , after fertilisation, second division of egg, early stage.		22 <i>Lilium</i> Embryo sac, 1st Division.	M
3 <i>Fritillaria</i> , after fertilisation, second division of egg, later stage.		23 <i>Lilium</i> Embryo sac, 1st Division.	M
4 <i>Fritillaria</i> , after fertilisation, second division of egg, later stage.		24 <i>Lilium</i> Embryo sac, 2nd Division.	M
5 <i>Fritillaria</i> , after fertilisation, second division of egg, later stage.		25 <i>Lilium</i> Embryo sac, 2nd Division.	M
6 <i>Fritillaria</i> , after fertilisation, second division complete; 4 nucleate embryo-sac.		26 <i>Lilium</i> Embryo sac, 4-nuclei stage.	M
7 <i>Fritillaria</i> , after fertilisation complete; arrangement of 4 nuclei.		27 <i>Lilium</i> Embryo sac, ripe.	M
8 <i>Fritillaria</i> , after fertilisation; 4-nucleate embryo-sac, a stage of arrangement.		28 <i>Lilium</i> fertilisation, fusion of male and female nuclei.	M
14 <i>Lilium Martagon</i> , flowering plant.	P	29 <i>Lilium</i> fertilization, 1st division fertilized egg.	M
15 <i>Lilium Martagon</i> , flowering head enlarged.	P	30 <i>Lilium</i> fertilization, 1st division oospores young walls formed.	M
16 <i>Lilium</i> Pollen mother cells, various stages.	M	31 <i>Lilium</i> fertilization, 1st division oospores later stage.	M
17 <i>Lilium</i> Pollen mother cells, di-aster stage, x 500.	M	37 <i>Capsella</i> , development of embryo.	D
18 <i>Lilium</i> Pollen mother cells, completion of 1st division.	M	38 <i>Capsella</i> , young embryo, L.S.	P
19 <i>Lilium</i> Embryo sac, megaspore.	M	39 <i>Capsella</i> , curled embryo, L.S., later stage.	M
20 <i>Lilium</i> Embryo sac, synapsis.	M	40 <i>Capsella</i> , seed and embryo.	M
		46 <i>Alisma</i> , life cycle.	D
		47 <i>Alisma</i> , young embryo.	M
		48 <i>Alisma</i> , young embryo, a little later.	M
		49 <i>Alisma</i> , young embryo, further advanced.	M

All Slides may be had Plain—unless otherwise stated.  
 P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section.  
 L.S.—Longitudinal Section.

**Section BB 18—PINUS SYLVESTRIS, SCOTS PINE.**

REPRODUCTION AND DEVELOPMENT.

A fine series of photographs and photomicrographs by the late Mr. W. T. Haydon, F.L.S., of Liverpool, who made an extensive study of this subject.

The following is a *small selection* from over 130 separate photographs, which cover the whole range of development of the plant from the earliest stages. Customers can have full particulars of the subjects *not* listed on application.

Plain Slides only, 1/6 each.

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 The Pine tree. (The sporophyte.)<br/>                 3 Ovulate, and staminate branches.<br/>                 4 Apex of ovulate cone-bearing branch, earliest indication of developing cone.<br/>                 6 Young ovulate cone, resting stage, winter, end of first year's growth.<br/>                 8 Young ovulate cone, showing bracts, and the scales which will eventually bear ovules.<br/>                 11 Embryo sac, macrospore mother cell, x 96.<br/>                 13 First division of embryo sac nucleus, macrospore mother cell division, x 280.<br/>                 15 Male gametophyte, in stages of development (pollen), x 96.<br/>                 23-25 Megaspore mother cell; pollen grains on nucellus, x 96.<br/>                 42 Nucellus with three pollen grains, "stalk" and "body" cells, also showing a tube nucleus; below is a portion of a young female gametophyte, x 96.<br/>                 45 "Body" and "stalk" cells leaving pollen grain, x 280.<br/>                 48 Young archegonia, x 96.<br/>                 52-53 Central cells, the nuclei in spire stage; funnel-shaped entrance for pollen tube, x 96 (two negatives).<br/>                 55 Mitosis of central cell, nearly complete; egg nucleus, x 96.</p> | <p>59 Mitosis complete; egg nuclei in archegonia travelling towards centre of egg, x 96.<br/>                 66-67 Adjoining sections showing path of pollen tube, with contents, x 90 (two negatives).<br/>                 68 Passage of pollen tube, with two sperms at end, x 96.<br/>                 73 Male gamete entering female gamete, x 280.<br/>                 76 Male gamete entering gamete; second functionless gamete seen above, x 96.<br/>                 84 Egg cytoplasm with "proteid bodies," contents of "jacket cells" passing into egg, x 280.<br/>                 85-89-90 Fertilised egg, phases in first division; the three sections contain whole of chromatin, x 280.<br/>                 93 Fertilised egg, mitosis in first division, x 280.<br/>                 104-105 Fertilised egg, second division; 24 chromosomes, adjoining sections, x 280.<br/>                 107 T.S. ovule, four free nuclei at base of egg.<br/>                 115-117 Two embryos on suspensors, with empty egg.<br/>                 119 Young embryos, much advanced; upper embryo successful, lower one breaking down.<br/>                 123-121 Fully-developed embryo, L.S.<br/>                 122 Fully developed seed, L.S.<br/>                 127-128 Chromosomes in "jacket cell," ten in one section, two in the other.</p> |
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**Section BB 19.—BRITISH FLORA.**

A series of selected photographs from nature taken by competent botanists. Many of those in former Catalogues have been replaced by better.

Those marked "A" are taken from growing plants in natural habitats.

Those marked "B" are close-up views of the plant, showing flowers, fruit, etc.

Plain Slides, 1/3 each. Coloured, 2/6 each. (See also Section BB 21.)

Arranged (chiefly) according to the London Catalogue, 10th Edition.

**RANUNCULACEÆ.**

- |                                                             |   |
|-------------------------------------------------------------|---|
| 1 Clematis Vitalba: Traveller's Joy                         | B |
| 2 Thalictrum flavum: Meadow Rue.                            | B |
| 3 Anemone Pulsatilla: Pasque Flower.                        | A |
| 4 Anemone nemorosa: Wood Anemone.                           | A |
| 5 Adonis annua: Pheasant's-eye.                             | B |
| 6 Ranunculus aquatilis: Water Crowfoot.                     | A |
| 7 Ranunculus perfoliatus, var. floribundus: Water Crowfoot. | A |
| 8 Ranunculus sceleratus: Celery Leaved Crowfoot.            | A |
| 9 Ranunculus Flammula: Lesser Spearwort.                    | A |
| 10 Ranunculus Flammula: Lesser Spearwort.                   | B |
| 11 Ranunculus Lingua: Greater Spearwort.                    | A |
| 12 Ranunculus auricomus: Goldilocks.                        | A |
| 13 Ranunculus acris: Buttercup.                             | A |
| 14 Ranunculus bulbosus: Bulbous Buttercup.                  | A |
| 15 Ranunculus Ficaria: Lesser Celandine.                    | A |
| 16 Caltha palustris, large bed: Marsh Marigold.             | A |
| 17 Trollius europæus: Globe Flower.                         | B |
| 18 Helleborus viridis: Green Hellebore.                     | A |
| 19 Aquilegia vulgaris: Columbine.                           | B |
| 20 Aquilegia chrysantha: Columbine.                         | A |
| 21 Aconitum Napellus: Monkshood.                            | B |

- |                                     |   |
|-------------------------------------|---|
| 22 Pisonia corallina: Common Paony. | A |
| 23 Actæa spicata: Baneberry.        | A |

**BERBERIDACEÆ.**

- |                                        |   |
|----------------------------------------|---|
| 30 Berberis vulgaris: Common Barberry. | B |
|----------------------------------------|---|

**NYPHÆACEÆ.**

- |                                       |   |
|---------------------------------------|---|
| 31 Nymphaea lutea: Yellow Water Lily. | A |
| 32 Castalia alba: White Water Lily.   | A |
| 33 Castalia alba: White Water Lily.   | B |

**PAPAVERACEÆ.**

- |                                          |   |
|------------------------------------------|---|
| 35 Papaver dubium: Red Poppy.            | A |
| 36 Papaver dubium: Red Poppy.            | B |
| 37 Meconopsis cambrica: Welsh Poppy.     | B |
| 38 Glaucium flavum: Horned Poppy.        | A |
| 39 Chelidonium majus: Greater Celandine. | A |
| 40 Chelidonium majus: Greater Celandine. | B |

**FUMARIACEÆ.**

- |                                           |   |
|-------------------------------------------|---|
| 43 Corydalis lutea: Yellow Fumitory.      | A |
| 44 Corydalis claviculata: White Fumitory. | A |
| 45 Fumaria officinalis: Common Fumitory.  | A |

All Slides may be had **Plain**—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section L.S.—Longitudinal Section.

Section BB 19—British Flora—Continued.



357—*Linaria vulgaris*, Toad Flax.

**CRUCIFERÆ.**

- |                                                         |   |
|---------------------------------------------------------|---|
| 48 <i>Nasturtium officinale</i> : Water Cress.          | A |
| 49 <i>Barbarea vulgaris</i> : Wintercress.              | A |
| 50 <i>Cardamine amara</i> : Large Bittercress.          | A |
| 51 <i>Cardamine pratensis</i> : Cuckoo Flower.          | A |
| 52 <i>Alyssum maritimum</i> : Sweet Alyssum.            | B |
| 53 <i>Draba verna</i> : Common Whitlow-grass.           | A |
| 53a <i>Draba incana</i> : Hoary Draba.                  | A |
| 54 <i>Cochlearia officinalis</i> : Common Scurvy-grass. | B |
| 55 <i>Cochlearia alpina</i> : Mountain Scurvy-grass.    | A |
| 56 <i>Sisymbrium officinale</i> : Common Hedge-mustard. | A |
| 57 <i>Sisymbrium Alliaria</i> : Garlic Mustard.         | A |
| 58 <i>Brassica oleracea</i> : Sea Cabbage.              | A |
| 59 <i>Brassica arvensis</i> : Wild Mustard.             | A |
| 60 <i>Capsella Bursa-pastoris</i> : Shepherd's Purse.   | A |
| 61 <i>Lepidium Smithii</i> : Smith's Cress.             | A |
| 62 <i>Thlaspi arvense</i> : Mithridate Mustard.         | B |
| 63 <i>Cakile maritima</i> : Sea Rocket.                 | A |
| 64 <i>Hesperis matronalis</i> : Dame's Rocket.          | A |

**RESEDACEÆ.**

- |                                                 |   |
|-------------------------------------------------|---|
| 71 <i>Reseda lutea</i> : Cut-leaved Mignonette. | A |
|-------------------------------------------------|---|

**CISTACEÆ.**

- |                                                |   |
|------------------------------------------------|---|
| 74 <i>Heliathemum Chamæcistus</i> : Rock Rose. | A |
| 75 <i>Heliathemum Chamæcistus</i> : Rock Rose. | B |

**VIOLACEÆ.**

- |                                                   |   |
|---------------------------------------------------|---|
| 78 <i>Viola hirta</i> : Hairy Violet.             | A |
| 79 <i>Viola canina</i> : Dog Violet.              | A |
| 80 <i>Viola tricolor</i> : Heartsease.            | A |
| 81 <i>Viola tricolor</i> : Heartsease.            | B |
| 82 <i>Viola lutea</i> : Mountain Pansy.           | A |
| 83 <i>Viola Riviniana</i> : Gerarde's Dog Violet. | A |

**POLYGALACEÆ.**

- |                                         |   |
|-----------------------------------------|---|
| 86 <i>Polygala vulgaris</i> : Milkwort. | B |
|-----------------------------------------|---|

**CARYOPHYLLACEÆ.**

- |                                                         |   |
|---------------------------------------------------------|---|
| 88 <i>Dianthus deltoides</i> : Maiden Pink.             | A |
| 89 <i>Dianthus glaucus</i> : Cheddar Pink.              | B |
| 90 <i>Saponaria officinalis</i> : Soapwort.             | B |
| 91 <i>Silene latifolia</i> : Campion.                   | B |
| 92 <i>Silene maritima</i> : Sea Campion.                | A |
| 93 <i>Silene acaulis</i> : Moss Campion.                | A |
| 94 <i>Lychnis alba</i> x <i>dioica</i> : White Campion. | A |
| 95 <i>Lychnis dioica</i> : Red Campion.                 | B |
| 96 <i>Lychnis dioica</i> : Red Campion.                 | A |
| 97 <i>Lychnis Flos-cuculi</i> : Ragged Robin.           | A |
| 98 <i>Lychnis Viscaria</i> : Red Catchfly.              | B |
| 99 <i>Lychnis Githago</i> : Corn Cockle.                | B |
| 100 <i>Cerastium arvense</i> : Field Chickweed.         | A |
| 101 <i>Stellaria aquatica</i> : Water Starwort.         | A |
| 102 <i>Stellaria Holostea</i> : Greater Stitchwort.     | A |
| 103 <i>Stellaria graminea</i> : Lesser Stitchwort.      | A |
| 104 <i>Arenaria peploides</i> : Sea Purlane.            | A |
| 105 <i>Sagina nodosa</i> : Knotted Pearlwort.           | A |
| 106 <i>Spargula arvensis</i> : Corn Spurry.             | A |
| 107 <i>Spargularia rubra</i> : Sand Spurry.             | A |

**TAMARICACEÆ.**

- |                                        |   |
|----------------------------------------|---|
| 114 <i>Tamarix gallica</i> : Tamarisc. | B |
|----------------------------------------|---|

**HYPERICACEÆ.**

- |                                                        |   |
|--------------------------------------------------------|---|
| 115 <i>Hypericum perforatum</i> : St. John's Wort.     | A |
| 116 <i>Hypericum perforatum</i> : St. John's Wort.     | B |
| 117 <i>Hypericum quadrangulum</i> : St. John's Wort.   | A |
| 118 <i>Hypericum hirsutum</i> : Hairy St. John's Wort. | B |
| 119 <i>Hypericum elodes</i> : Marsh St. John's Wort.   | A |

**MALVACEÆ.**

- |                                              |   |
|----------------------------------------------|---|
| 124 <i>Lavatera arborea</i> : Tree Mallow.   | A |
| 125 <i>Malva moschata</i> : Musk Mallow.     | B |
| 126 <i>Malva sylvestris</i> : Common Mallow. | A |

**LINACEÆ.**

- |                                        |   |
|----------------------------------------|---|
| 129 <i>Linum usitatissimum</i> : Flax. | A |
| 130 <i>Linum usitatissimum</i> : Flax. | B |

**GERANIACEÆ.**

- |                                                      |   |
|------------------------------------------------------|---|
| 133 <i>Geranium sanguineum</i> : Blood Red Geranium. | A |
| 134 <i>Geranium sanguineum</i> : Blood Red Geranium. | B |
| 135 <i>Geranium sylvaticum</i> : Wood Geranium.      | B |
| 136 <i>Geranium pratense</i> : Meadow Crane's-bill.  | A |
| 137 <i>Geranium lucidum</i> : Shining Crane's-bill.  | A |
| 138 <i>Geranium Robertianum</i> : Herb-Robert.       | A |
| 139 <i>Erodium cicutarium</i> : Stork's-bill.        | A |
| 140 <i>Oxalis Acetosella</i> : Wood Sorrel.          | A |
| 141 <i>Impatiens Noli-tangere</i> : Balsam.          | B |

**AQUIFOLIACEÆ.**

- |                                            |   |
|--------------------------------------------|---|
| 148 <i>Ilex Aquifolium</i> : Common Holly. | A |
| 149 <i>Ilex Aquifolium</i> : Common Holly. | B |

**CELASTRACEÆ.**

- |                                              |   |
|----------------------------------------------|---|
| 150 <i>Euonymus europæus</i> : Spindle Tree. | B |
|----------------------------------------------|---|

**RHAMNACEÆ.**

- |                                             |   |
|---------------------------------------------|---|
| 152 <i>Rhamnus catharticus</i> : Buckthorn. | B |
|---------------------------------------------|---|

**LEGUMINOSÆ.**

- |                                                   |   |
|---------------------------------------------------|---|
| 154 <i>Genista anglica</i> : Petty Whin.          | A |
| 155 <i>Genista anglica</i> : Petty Whin.          | B |
| 156 <i>Genista tinctoria</i> : Dyer's Green Weed. | A |
| 157 <i>Ulex europæus</i> : Furze.                 | B |
| 158 <i>Cytisus scoparius</i> : Broom.             | A |
| 159 <i>Cytisus scoparius</i> : Broom.             | B |
| 160 <i>Ononis repens</i> : Restharrow.            | A |

Slides Toned to an Artistic Brown Shade cost 6d. each, or 4/6 per dozen extra.



Section BB 19—British Flora—Continued.

161 <i>Ononis repens</i> : Restharrow.	B	249 <i>Chrysosplenium oppositifolium</i> : Golden Saxifrage.	A
162 <i>Ononis spinosa</i> : Restbarrow.	A	250 <i>Chrysosplenium oppositifolium</i> : Golden Saxifrage.	B
163 <i>Mellilotus officinalis</i> : Corn Mellilot.	B	251 <i>Chrysosplenium alternifolium</i> : Golden Saxifrage.	B
164 <i>Trifolium pratense</i> : Red Clover.	A	252 <i>Parnassia palustris</i> : Grass of Parnassus.	A
165 <i>Trifolium pratense</i> : Red Clover.	B	253 <i>Parnassia palustris</i> : Grass of Parnassus.	B
166 <i>Trifolium repens</i> : White Clover.	A	254 <i>Ribes rubrum</i> : Red Currant.	B
167 <i>Trifolium procumbens</i> : Hop Clover.	A	<b>CRASSULACEÆ.</b>	
168 <i>Anthyllus Vulneraria</i> : Lady's fingers.	A	258 <i>Cotyledon Umbilicus-Veneris</i> : Wall Pennywort.	A
169 <i>Lotus corniculatus</i> : Bird's Foot Trefoll.	A	259 <i>Sedum roseum</i> : Rose Root.	A
170 <i>Lotus corniculatus</i> : Bird's Foot Trefoll.	B	260 <i>Sedum Telephium</i> : Orpine.	B
171 <i>Astragalus glycyphyllos</i> : Milk Vetch (fruit).	A	261 <i>Sedum villosum</i> : Hairy Sedum.	A
172 <i>Ornithopus perpusillus</i> : Bird's-foot.	B	262 <i>Sedum anglicum</i> : Stone Crop.	A
173 <i>Vicia birsuta</i> : Hairy Vetch.	A	263 <i>Sedum acre</i> : Biting Crop.	A
174 <i>Vicia Cracca</i> : Tufted Vetch.	B	264 <i>Sempervivum tectorum</i> : House Leek.	B
175 <i>Vicia Cracca</i> : Tufted Vetch.	A	<b>DROSERACEÆ.</b>	
176 <i>Vicia sylvatica</i> : Wood Vetch.	A	268 <i>Drosera rotundifolia</i> : Common Sundew.	A
177 <i>Vicia sepium</i> : Busb Vetch.	A	269 <i>Drosera anglica</i> : Sundew.	A
178 <i>Vicia sativa</i> : Common Vetch.	A	<b>HALORAGACEÆ.</b>	
179 <i>Lathyrus Nissolia</i> : Grass-leaved Vetch.	B	272 <i>Myriophyllum verticillatum</i> : Water Milfoil.	A
180 <i>Lathyrus pratensis</i> : Meadow Pea.	B	273 <i>Callitriche aquatica</i> : Water Starwort.	A
181 <i>Lathyrus sylvestris</i> : Everlasting Pea.	B	274 <i>Callitriche aquatica</i> : Water Starwort.	B
182 <i>Lathyrus montanus</i> (macrorrhizus): Tuberous Pea.	A	<b>LYTHRACEÆ.</b>	
<b>ROSACEÆ.</b>		277 <i>Lythrum Salicaria</i> : Purple Loosestrife on river bank.	A
193 <i>Prunus spinosa</i> : Blackthorn.	A	278 <i>Lythrum Salicaria</i> : Purple Loosestrife, enlarged fl.	A
194 <i>Prunus spinosa</i> : Blackthorn.	B	<b>ONAGRACEÆ.</b>	
195 <i>Prunus Padus</i> : Bird Cherry.	B	280 <i>Epilobium angustifolium</i> : Willow-herb.	A
196 <i>Prunus Malus</i> : Crab Apple.	B	281 <i>Epilobium angustifolium</i> : Willow-herb.	B
197 <i>Spiraea salicifolia</i> : Willow-leaved Spiraea.	A	282 <i>Epilobium birsutum</i> : Great Willow-herb.	A
198 <i>Spiraea Ulmaria</i> : Meadow Sweet.	B	283 <i>Epilobium parvidorum</i> : Hoary Willow-herb.	A
199 <i>Spiraea Filipendula</i> : Dropwort.	B	284 <i>Oenothera biennis</i> : Evening Primrose.	A
200 <i>Rubus fruticosus</i> : Blackberry.	A	285 <i>Circæa lutetiana</i> : Enchanter's Nightshade.	A
201 <i>Rubus fruticosus</i> : Blackberry, Flowers and Fruit.	B	286 <i>Circæa lutetiana</i> : Enchanter's Nightshade.	B
202 <i>Rubus saxatilis</i> : Stone Bramble.	A	<b>CUCURBITACEÆ.</b>	
203 <i>Rubus Chamaemorus</i> : Cloudberry in fruit.	B	289 <i>Bryonia dioica</i> : White Bryony.	A
204 <i>Rubus Chamaemorus</i> : Cloudberry in flower.	B	290 <i>Bryonia dioica</i> : White Bryony.	B
205 <i>Geum urbanum</i> : Herb Bennet.	A	<b>UMBELLIFERÆ.</b>	
206 <i>Geum rivale</i> : Water Avens.	A	292 <i>Hydrocotyle vulgaris</i> : Marsh Pennywort.	B
207 <i>Geum rivale</i> : Water Avens.	B	293 <i>Eryngium maritimum</i> : Sea Holly.	B
208 <i>Fragaria Vesca</i> : Wild Strawberry.	A	294 <i>Eryngium maritimum</i> : Sea Holly.	B
209 <i>Potentilla sterilis</i> : Barren Strawberry.	A	295 <i>Astrantia minor</i> : Astrantia.	B
210 <i>Potentilla Tormentilla</i> : Tormentil.	A	296 <i>Astrantia major</i> : Astrantia.	B
211 <i>Potentilla reptans</i> : Creeping Cinquefoil.	A	297 <i>Sanicula europæa</i> : Wood Sanicle.	A
212 <i>Potentilla Anserina</i> : Silver Weed.	A	298 <i>Conium maculatum</i> : Hemlock.	A
213 <i>Potentilla fruticosa</i> : Scrubby Potentilla.	A	299 <i>Conium maculatum</i> : Hemlock.	B
214 <i>Potentilla palustris</i> : Marsh Cinquefoil.	A	300 <i>Smyrniolum Olusatrum</i> : Alexanders.	A
215 <i>Potentilla palustris</i> : Marsh Cinquefoil.	A	301 <i>Apium nodiflorum</i> : Wild Celery.	B
216 <i>Alechemilla vulgaris</i> : Lady's Mantle.	B	302 <i>Myrrhis odorata</i> : Sweet Cicely.	A
217 <i>Alechemilla alpina</i> : Alpine Lady's Mantle.	A	303 <i>Conopodium denudatum</i> : Earthnut.	A
218 <i>Poterium Sanguisorba</i> : Salad Burnet.	A	304 <i>Scandix Pecten</i> : Venus Comb.	A
219 <i>Poterium officinale</i> : Great Burnet.	B	305 <i>Anthriscus vulgaris</i> : Hedge Parsley.	A
220 <i>Poterium officinale</i> : Great Burnet.	A	306 <i>Cerithium maritimum</i> : Sea Sampfire.	A
221 <i>Rosa spinosissima</i> : Burnet Rose.	A	307 <i>Genantbe fistulosa</i> : Water Dropwort.	A
222 <i>Rosa canina</i> : Wild Rose.	A	308 <i>Genantbe fistulosa</i> : Water Dropwort.	B
223 <i>Pyrus Aucuparia</i> : Mountain Ash.	A	309 <i>Genantbe crocata</i> : Hemlock Dropwort.	A
224 <i>Pyrus Aucuparia</i> : Mountain Ash.	B	310 <i>Genantbe aquatica</i> : Fine-leaved Dropwort.	A
225 <i>Pyrus Malus</i> flowers: Wild Apple.	B	311 <i>Æthusa Cynapium</i> : Fool's Parsley.	A
226 <i>Pyrus Malus</i> fruit: Wild Apple.	B	312 <i>Angelica sylvestris</i> : Wild Angelica.	A
227 <i>Cratægus Oxyacantha</i> : Hawthorn, Flowers.	B	313 <i>Hieracium Spondylium</i> : Cow Parsnip.	A
228 <i>Cratægus Oxyacantha</i> : Hawthorn, Fruit.	B	314 <i>Pastinaca sativa</i> : Wild Parsnip.	A
229 <i>Cotoneaster Integerrima</i> : Cotoneaster.	A		
230 <i>Cotoneaster Integerrima</i> : Cotoneaster.	B		
<b>SAXIFRAGACEÆ.</b>			
243 <i>Saxifraga oppositifolia</i> : Purple Saxifrage.	A		
244 <i>Saxifraga stellaris</i> : Star Saxifrage.	A		
245 <i>Saxifraga aizoides</i> : Yellow Saxifrage.	A		
246 <i>Saxifraga tridactylites</i> : Rue-leaved Saxifrage.	A		
247 <i>Saxifraga granulata</i> : Meadow Saxifrage.	A		
248 <i>Saxifraga hypnoides</i> : Cut-leaved Saxifrage.	A		

All Slides may be bad Plain—unless otherwise stated.

P—Photograph D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section  
L.S.—Longitudinal Section.

## Section BB 19—British Flora—Continued.

315	<i>Daucus Carota</i> : Wild Carrot.	A	391	<i>Chrysanthemum Leucanthemum</i> : Ox Eye Daisy.	A
316	<i>Daucus Carota</i> : Wild Carrot.	B	392	<i>Chrysanthemum Leucanthemum</i> : Ox Eye Daisy.	B
<b>ARALIACEÆ.</b>					
327	<i>Hedera Helix</i> : Ivy on Tree.	A	393	<i>Matricaria inodora</i> : Scentless Mayweed.	A
328	<i>Hedera Helix</i> : Ivy, Flowers and Fruit.	B	394	<i>Matricaria Chamomilla</i> : Wild Chamomile.	A
<b>CORNACEÆ.</b>					
329	<i>Cornus suecica</i> : Dwarf Cornel.	A	395	<i>Tanacetum vulgare</i> , Tansy.	B
<b>CAPRIFOLIACEÆ.</b>					
332	<i>Adoxa Moschatellina</i> : Musk Root.	A	396	<i>Tussilago Farfara</i> : Coltsfoot.	A
333	<i>Adoxa Moschatellina</i> : Musk Root.	B	397	<i>Tussilago Farfara</i> : Coltsfoot.	B
334	<i>Sambucus nigra</i> : Elder.	A	398	<i>Petasites ovatus</i> : Butterbur on river bank.	A
335	<i>Sambucus nigra</i> : Elder.	B	399	<i>Petasites ovatus</i> : Butterbur in bud.	A
336	<i>Viburnum Opulus</i> : Wild Guelder Rose.	A	400	<i>Petasites ovatus</i> : Butterbur in flower.	B
337	<i>Viburnum Opulus</i> : Wild Guelder Rose.	B	401	<i>Senecio viscosus</i> : Stinking Groundsel.	A
338	<i>Viburnum Lantana</i> : Wayfaring tree.	A	402	<i>Senecio erucifolius</i> : Narrow-leaved Ragwort.	A
339	<i>Lonicera Periclymenum</i> : Honeysuckle.	B	403	<i>Senecio erucifolius</i> : Narrow-leaved Ragwort.	B
340	<i>Lonicera Periclymenum</i> : abnormal flowers.	B	404	<i>Senecio Jacobea</i> : Common Ragwort.	A
<b>RUBIACEÆ.</b>					
344	<i>Rubia peregrina</i> : Wild Madder.	B	405	<i>Senecio Jacobea</i> : Common Ragwort.	B
345	<i>Gallum boreale</i> : Northern Bedstraw.	A	406	<i>Senecio aquaticus</i> : Marsh Ragwort.	A
346	<i>Gallum Cruciata</i> : Cross Wort.	A	407	<i>Senecio aquaticus</i> : Marsh Ragwort.	B
347	<i>Gallum saxatile</i> : Heath Bedstraw.	A	408	<i>Senecio vulgaris</i> : Groundsel.	B
348	<i>Gallum palustre</i> : Marsh Bedstraw.	A	409	<i>Carlina vulgaris</i> : Carlina.	B
349	<i>Gallum Aparine</i> : Goose Grass.	A	410	<i>Carlina vulgaris</i> : Carlina.	B
350	<i>Asperula odorata</i> : Woodruff.	A	411	<i>Carduus nutans</i> : Musk Thistle.	A
351	<i>Asperula odorata</i> : Woodruff.	B	412	<i>Cnicus lanceolatus</i> : Spear Thistle.	A
352	<i>Sherardia arvensis</i> : Field Madder.	A	413	<i>Cnicus eriophorus</i> : Woolly-headed Thistle.	A
<b>VALERIANACEÆ.</b>					
355	<i>Valeriana dioica</i> : Marsh Valerian.	A	414	<i>Cnicus pratensis</i> : Meadow Thistle.	A
356	<i>Valeriana dioica</i> : Marsh Valerian.	B	415	<i>Cnicus heterophyllus</i> : Melancholy Thistle.	B
357	<i>Valeriana officinalis</i> : Common Valerian.	A	416	<i>Cnicus acaulis</i> : Dwarf Thistle.	A
358	<i>Kenthanthus ruber</i> : Red Valerian.	B	417	<i>Cnicus arvensis</i> : Creeping Thistle, group.	A
<b>DIPSACEÆ.</b>					
362	<i>Dipsacus sylvestris</i> : Wild Teasel.	A	418	<i>Serratula tinctoria</i> : Sawwort.	A
363	<i>Dipsacus sylvestris</i> : Wild Teasel.	B	419	<i>Serratula tinctoria</i> : Sawwort.	B
364	<i>Dipsacus sylvestris</i> : Wild Teasel, water storage leaves.	B	420	<i>Centaurea nigra</i> : Knapweed.	B
365	<i>Dipsacus pilosus</i> : Small Teasel.	B	421	<i>Centaurea nigra</i> : Knapweed.	B
366	<i>Scabiosa succisa</i> : Devil's Bit Scabious.	A	422	<i>Centaurea Scabiosa</i> : Greater Knapweed.	A
367	<i>Scabiosa succisa</i> : Devil's Bit Scabious.	B	423	<i>Centaurea Scabiosa</i> : Greater Knapweed.	B
368	<i>Scabiosa arvensis</i> : Field Scabious.	A	424	<i>Centaurea Cyanus</i> : Cornflower.	B
369	<i>Scabiosa arvensis</i> : Field Scabious.	B	425	<i>Cichorium Intybus</i> : Chicory.	B
<b>COMPOSITÆ.</b>					
370	<i>Eupatorium cannabinum</i> : Hemp Agrimony.	A	426	<i>Lapsana communis</i> : Common Nipplewort.	A
371	<i>Eupatorium cannabinum</i> : Hemp Agrimony.	B	427	<i>Lapsana communis</i> : Common Nipplewort.	B
372	<i>Solidago Virgaurea</i> : Golden Rod.	A	428	<i>Crepis capillaris</i> : Smooth Hawk's-beard.	A
373	<i>Solidago Virgaurea</i> : Golden Rod.	B	429	<i>Crepis capillaris</i> : Smooth Hawk's-beard.	B
374	<i>Bellis perennis</i> : Field of Daisies.	A	430	<i>Hieracium Pilosella</i> : Mouse-eared Hawkweed.	A
375	<i>Bellis perennis</i> : Daisy.	B	431	<i>Hieracium sabaudum</i> : Savoy Hawkweed.	A
376	<i>Aster Tripolium</i> : Sea Aster.	A	432	<i>Hieracium sabaudum</i> : Savoy Hawkweed.	B
377	<i>Erigeron acris</i> : Blue Fleabane.	B	433	<i>Hypochoeris radicata</i> : Cat's Ear.	A
378	<i>Flago germanica</i> : Spreading Cudweed.	B	434	<i>Taraxacum officinale</i> in flower and fruit.	A
379	<i>Antennaria dioica</i> : Mountain Everlasting.	A	435	<i>Sonchus arvensis</i> , Sow Thistle.	A
380	<i>Gnaphalium uliginosum</i> : Marsh Cudweed.	A	<b>CAMPANULACEÆ.</b>		
381	<i>Inula Helenium</i> : Elecampane.	B	44a	<i>Lobelia Dortmanna</i> : Water Lobelia.	A
382	<i>Inula squarrosa</i> (Conyza): Ploughman's Spikenard.	B	44b	<i>Juncione montana</i> : Sheep's bit.	B
383	<i>Inula erithimoides</i> : Golden Samphire.	A	450	<i>Wahlenbergia hederacea</i> : Ivy-leaved Campanula.	A
384	<i>Pulicaria dysenterica</i> : Common Fleabane.	A	451	<i>Phyteuma orbiculare</i> : Red-beaded Rampion.	B
385	<i>Pulicaria dysenterica</i> : Common Fleabane.	B	452	<i>Campanula glomerata</i> : Clustered Campanula.	B
386	<i>Achillea Millefolium</i> : Yarrow.	A	453	<i>Campanula latifolia</i> : Giant Campanula.	A
387	<i>Achillea Millefolium</i> : Yarrow.	B	454	<i>Campanula rotundifolia</i> : Harebell.	A
388	<i>Achillea Ptarmica</i> : Sneezewort.	A	<b>VACCINIACEÆ.</b>		
389	<i>Achillea Ptarmica</i> : Sneezewort.	B	458	<i>Vaccinium Vitis-Idæa</i> : Cowberry, on hillside.	A
390	<i>Anthemis arvensis</i> : Corn Chamomile.	A	459	<i>Vaccinium Vitis-Idæa</i> : Cowberry, near view.	A
<b>ERICACEÆ.</b>					
461	<i>Oxycoccus quadripetala</i> : Cranberry.	A	460	<i>Vaccinium Myrtillus</i> : Bilberry.	B
461	<i>Oxycoccus quadripetala</i> : Cranberry.	B	461	<i>Oxycoccus quadripetala</i> : Cranberry.	A
461	<i>Oxycoccus quadripetala</i> : Cranberry.	A	<b>ERICACEÆ.</b>		
461	<i>Oxycoccus quadripetala</i> : Cranberry.	B	461	<i>Arbutus Unedo</i> : Arbutus, in fruit.	B
461	<i>Oxycoccus quadripetala</i> : Cranberry.	A	465	<i>Andromeda Polifolia</i> : Andromeda.	B
461	<i>Oxycoccus quadripetala</i> : Cranberry.	B	466	<i>Calluna vulgaris</i> : Heather (Ling).	A
461	<i>Oxycoccus quadripetala</i> : Cranberry.	A	467	<i>Calluna vulgaris</i> : Heather (Ling).	A

Carrying Boxes, with Rubber Packing and Leather Handles—See Cover.

Section BB 19—British Flora—Continued.

468 Erica Tetralix: Cross-leaved heath.	A		
469 Erica Tetralix: Cross-leaved heath.	B		
470 Erica cinerea: Bell Heather.	A		
471 Pyrola rotundifolia: Winter Green.	B		
472 Pyrola media and minor: Winter Green.	A		
473 Pyrola minor: Common Winter Green.	A		
<b>MONOTROPACEÆ.</b>			
478 Monotropa Hypopitys: Bird's Nest.	B		
<b>PLUMBAGINACEÆ.</b>			
479 Limonium vulgare: Sea Lavender.	A		
480 Statice maritima: Common Thrift.	A		
<b>PRIMULACEÆ.</b>			
484 Hottonia palustris: Water Violet.	A		
485 Primula vulgaris: Primrose.	A		
486 Primula veris: Cowslip.	A		
487 Primula veris: Cowslip.	B		
488 Primula farinosa: Bird's Eye Primrose.	A		
489 Lysimachia vulgaris: Yellow Loosestrife.	A		
490 Lysimachia vulgaris: Yellow Loosestrife.	B		
491 Lysimachia Nummularia: Moneywort.	A		
492 Lysimachia nemorum: Wood-loosestrife.	A		
493 Trientalis europæa: Trientale.	A		
494 Glaux maritima: Sea Milkwort.	A		
496 Anagallis arvensis: Scarlet Pimpernel.	B		
496 Anagallis tenella: Bog Pimpernel.	A		
497 Anagallis tenella: Bog Pimpernel.	B		
498 Samolus Valerandi: Brookweed.	B		
<b>OLEACEÆ.</b>			
502 Ligustrum vulgare: Privet.	B		
<b>GENTIANACEÆ.</b>			
506 Blackstonia perfoliata: Yellowwort.	A		
507 Blackstonia perfoliata: Yellowwort.	B		
508 Centaurea umbellata: Centaury.	B		
509 Gentiana verna: Spring Gentian.	A		
510 Gentiana Amarella: Autumn Gentian.	A		
511 Gentiana campestris: Field Gentian.	A		
512 Menyanthes trifoliata: Bog Bean.	A		
<b>POLEMONIACEÆ.</b>			
516 Polemonium coeruleum: Jacob's Ladder.	B		
<b>BORAGINACEÆ.</b>			
618 Cynoglossum officinale: Hound's tongue.	A		
519 Symphytum officinale: Comfrey.	A		
620 Symphytum officinale: Comfrey.	B		
621 Anchusa sempervirens: Alkanet.	A		
622 Anchusa sempervirens: Alkanet.	B		
523 Pulmonaria officinalis: Common Lungwort.	B		
624 Myosotis scorpioides: Forgetmenot.	A		
625 Myosotis sylvatica: Wood forgetmenot.	A		
626 Myosotis arvensis: Scorpion grass.	A		
527 Lithospermum officinale: Common Gromwell.	A		
528 Lithospermum officinale: Common Gromwell.	B		
629 Echium vulgare: Viper's Bugloss.	A		
330 Borago officinalis: Corn Borage.	A		
<b>CONVOLVULACEÆ.</b>			
535 Calystegia sepium: Great Bindweed.	A		
536 Calystegia Soldanella: Sea Bindweed.	A		
537 Convolvulus arvensis: Lesser Bindweed.	A		
538 Cuscuta europæa: Dodder.	A		
<b>SOLANACEÆ.</b>			
542 Solanum Dulcamara: Bitter Sweet.	A		
543 Solanum Dulcamara.	B		
544 Solanum nigrum: Black Nightshade.	A		
545 Lycium barbarum: "Tea Plant."	A		
646 Atropa Belladonna: Deadly Nightshade.	A		
547 Atropa Belladonna: Deadly Nightshade.	B		
548 Hyoscyamus niger: Henbane.	A		
549 Hyoscyamus niger: Henbane.	B		
550 Hyoscyamus niger: Henbane in fruit.	B		
<b>SCROPHULARIACEÆ.</b>			
551 Verbascum Thapsus: Mullein.	A		
544 Verbascum nigrum: Black Mullein.	A		
555 Linaria Cymbalaria: Ivy-leaved Toad Flax.	A		
556 Linaria repens: Creeping Toad Flax.	B		
557 Linaria vulgaris: Common Toad Flax.	A		
558 Linaria vulgaris: Common Toad Flax.	B		
559 Antirrhinum majus: Snapdragon.	A		
560 Scrophularia aquatica: Water Figwort.	A		
561 Scrophularia aquatica: Water Figwort.	B		
562 Scrophularia vernalis: Yellow Figwort.	B		
563 Mimulus Langsdorffii: Mimulus.	A		
563a Mimulus Langsdorffii: Mimulus.	B		
564 Digitalis purpurea: Foxglove.	A		
565 Digitalis purpurea: Foxglove.	B		
566 Veronica officinalis: Common Speedwell.	A		
567 Veronica Chamaedrys: Germander Speedwell.	A		
568 Veronica Beccabunga: Brooklime.	A		
569 Euphrasia officinalis: Eyebright.	A		
570 Euphrasia officinalis: Eyebright.	B		
571 Bartsia Odontites: Red Bartsia.	A		
572 Bartsia Odontites: Red Bartsia.	B		
573 Pedicularis palustris: Red Rattle.	A		
574 Pedicularis sylvatica: Red Rattle.	A		
575 Pedicularis sylvatica: Lousewort.	A		
576 Rhinanthus Crista-galli: Common Rattle.	A		
577 Melampyrum pratense: Cow Wheat.	A		
578 Melampyrum pratense: Cow Wheat.	B		
<b>OROBANCHACEÆ.</b>			
589 Orobancha minor: Broomrape.	A		
590 Lathraea Squamaria: Toothwort.	A		
<b>VERBENACEÆ.</b>			
594 Verbena officinalis: Vervain.	A		
695 Verbena officinalis: Vervain.	B		
<b>LABIATEÆ.</b>			
595a Mentha aquatica: Water Mint.	A		
596 Mentha aquatica: Water Mint.	B		
597 Mentha arvensis: Corn Mint.	A		
598 Lycopus europæus: Gypsywort.	A		
599 Lycopus europæus: Gypsywort.	B		
600 Origanum vulgare: Wild Marjoram.	B & A		
601 Thymus Serpyllum: Wild Thyme.	A		
602 Cimicifuga vulgare: Wild Basil.	A		
603 Calamintha officinalis: Calamint.	A		
604 Salvia Verbenaca: Wild Sage.	A		
605 Nepeta Cataria: Cat Mint.	A		
606 Nepeta hederacea: Ground Ivy.	A		
607 Scutellaria galericulata: Skull Cap.	A		
608 Scutellaria galericulata: Skull Cap.	B		
609 Prunella vulgaris: Self Heal.	A		
610 Melittis Melisophyllum: Balm.	B		
611 Marrubium vulgare: Horehound.	A		
612 Stachys officinalis: Betony.	A		
613 Stachys palustris: Marsh Woundwort.	B		
614 Stachys sylvatica: Hedge Woundwort.	A		
615 Galeopsis Ludanum.	A		
616 Galeopsis speciosa: Yellow Hemp Nettle.	A		
617 Galeopsis speciosa: Yellow Hemp Nettle.	B		
618 Galeopsis Tetrahit.	A		
619 Leonurus Cardiaea: Motherwort.	A		
620 Lamium purpureum: Purple Dead Nettle.	A		
621 Lamium album: White Dead Nettle.	A		
622 Lamium album: White Dead Nettle.	B		
623 Lamium Galeobdolon: Yellow Dead Nettle.	A		
624 Lamium Galeobdolon: Yellow Dead Nettle.	B		
625 Teucrium Scorodonia: Wood Sage.	A		
626 Ajuga reptans: Bugle.	A		
627 Ajuga reptans: Bugle.	B		
628 Ajuga reptans: Bugle, showing rootlets.	B		
<b>PLANTAGINACEÆ.</b>			
639 Plantago major: Greater Plantain.	A		

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

Section BB 19—British Flora—Continued.

640 <i>Plantago media</i> : Hoary Plantain.	A		
641 <i>Plantago lanceolata</i> : Common Ribwort.	A		
642 <i>Plantago lanceolata</i> : Common Ribwort.	B		
643 <i>Plantago maritima</i> : Sea Plantain.	A		
644 <i>Plantago Coronopus</i> : Buck's Horn Plantain.	A		
<b>CHENOPODIACEÆ.</b>			
645 <i>Chenopodium Bonus-Henricus</i> : Good King Henry.	A		
646 <i>Beta maritima</i> : Wild Beet.	A		
647 <i>Atriplex laciniata</i> : Frosted Orache.	A		
648 <i>Salicornia herbacea</i> : Glasswort.	A		
649 <i>Salicornia herbacea</i> : Glasswort.	B		
650 <i>Suaeda maritima</i> .	B		
651 <i>Salsola Kali</i> : Prickly Saltwort.	A		
<b>POLYGONACEÆ.</b>			
656 <i>Polygonum Hydropiper</i> : Water Pepper.	A		
657 <i>Polygonum Persicaria</i> : Persicaria.	A		
658 <i>Polygonum amphibium</i> : Floating Persicaria.	A		
659 <i>Polygonum Bistorta</i> : Bistort.	A		
660 <i>Polygonum Bistorta</i> : Bistort.	B		
661 <i>Rumex obtusifolius</i> : Common Dock.	A		
662 <i>Rumex Hydrolapathum</i> : Water Dock.	A		
<b>THYMELEACEÆ</b>			
667 <i>Daphne Mezereum</i> : Mezereon.	A		
668 <i>Daphne Laureola</i> : Spurge Laurel.	A		
669 <i>Daphne Laureola</i> : Spurge Laurel.	B		
<b>ELAEAGNACEÆ.</b>			
670 <i>Hippophae Rhamnoides</i> : Sea Buckthorn.	A		
<b>LORANTHACEÆ.</b>			
671 <i>Viscum album</i> : Mistletoe on Apple Tree.	A		
672 <i>Viscum album</i> : Mistletoe on Apple Tree.	B		
<b>EUPHORBACEÆ.</b>			
673 <i>Euphorbia amygdaloides</i> : Wood Spurge.	B		
674 <i>Euphorbia Esula</i> : Leafy Spurge.	B		
675 <i>Euphorbia Paralias</i> : Sea Spurge.	A		
676 <i>Euphorbia Paralias</i> : Sea Spurge.	B		
677 <i>Buxus sempervirens</i> : Box.	B		
678 <i>Mercurialis perennis</i> : Dog's Mercury.	A		
679 <i>Mercurialis perennis</i> : Dog's Mercury.	B		
<b>URTICACEÆ.</b>			
683 <i>Humulus Lupulus</i> : Hop Garden.	A		
684 <i>Humulus Lupulus</i> : Hop.	B		
685 <i>Humulus Lupulus</i> : Gathering Hops.	A		
686 <i>Urtica dioica</i> : Common Nettle.	A		
<b>MYRICACEÆ.</b>			
690 <i>Myrica Gale</i> : Sweet Gale.	B		
<b>CUPULIFERÆ (see Forest Trees).</b>			
<b>SALICACEÆ.</b>			
691 <i>Salix herbacea</i> : Dwarf Willow, staminate.	A		
692 <i>Salix herbacea</i> : Dwarf Willow, pistillate.	A		
693 <i>Salix pentandra</i> , male catkins and leaves: Bay Willow.	B		
694 <i>Salix cinerea</i> and catkins on same branch: Gray Willow.	B		
695 <i>Salix repens</i> in fruit: Creeping Willow.	A		
696 <i>Salix fragilis</i> in fruit: Crack Willow.	A		
<b>EMPETRACEÆ.</b>			
700 <i>Empetrum nigrum</i> : Crowberry.	B		
<b>CERATOPHYLLACEÆ.</b>			
701 <i>Ceratophyllum demersum</i> : Horn Wort.	A		
<b>CONIFERÆ (see also Section BB21).</b>			
702 <i>Juniperus communis</i> , in Landscape.	A		
<b>HYDROCHARIDACEÆ.</b>			
703 <i>Elodea canadensis</i> in flower: American Water Weed.	B		
704 <i>Stratiotes Aloides</i> : Water Soldier.	A		
<b>ORCHIDACEÆ.</b>			
706 <i>Neottia Nidus-avis</i> : Bird's Nest Orchid.	A		
707 <i>Listera ovata</i> : Twayblade.	A		
708 <i>Listera ovata</i> : Twayblade.	B		
709 <i>Listera cordata</i> : Lesser Twayblade.	A		
710 <i>Spiranthes spiralis</i> : Lady's Tresses.	A		
711 <i>Cephalanthera longifolia</i> : Narrow Helleborine.	A		
712 <i>Epipactis latifolia</i> : Broad-leaved Epipactis.	A		
713 <i>Epipactis latifolia</i> : Broad-leaved Epipactis.	B		
714 <i>Epipactis palustris</i> : Marsh Epipactis.	B		
715 <i>Orchis pyramidalis</i> : Pyramid Orchid.	B		
716 <i>Orchis pyramidalis</i> : Pyramid Orchid.	B		
717 <i>Orchis ustulata</i> : Dwarf Orchid.	A		
718 <i>Orchis Morio</i> : Green-winged Orchid.	A		
719 <i>Orchis mascula</i> : Early Purple Orchid.	A		
720 <i>Orchis mascula</i> : Early Purple Orchid.	B		
721 <i>Orchis incarnata</i> .	A		
722 <i>Orchis latifolia</i> : Marsh Orchid.	A		
723 <i>Orchis maculata</i> : Spotted Orchid.	A		
724 <i>Orchis maculata</i> : Spotted Orchid.	B		
725 <i>Ophrys apifera</i> : Bee Orchid.	A		
726 <i>Ophrys apifera</i> : Bee Orchid.	B		
727 <i>Ophrys apifera</i> : Bee Orchid, flower enlarged.	B		
728 <i>Ophrys sphegodes</i> : Spider Orchid.	B		
729 <i>Ophrys muscifera</i> : Fly Orchid.	A		
730 <i>Ophrys muscifera</i> : Fly Orchid.	B		
731 <i>Habenaria conopsea</i> : Fragrant Habenaria.	A		
732 <i>Habenaria viridis</i> : Frog Orchid.	A		
733 <i>Habenaria bifida</i> : Butterfly Orchid.	A		
734 <i>Habenaria bifida</i> : Butterfly Orchid.	B		
735 <i>Habenaria bifida</i> : Butterfly Orchid, flower enlarged.	B		
736 <i>Habenaria virescens</i> : Great Butterfly Orchid.	A		
737 <i>Habenaria virescens</i> : Great Butterfly Orchid.	B		
738 <i>Cypripedium Calceolus</i> : Slipper Orchid.	A		
<b>IRIDACEÆ.</b>			
745 <i>Iris Pseudacorus</i> : Yellow Flag.	A		
746 <i>Iris Pseudacorus</i> : Yellow Flag.	B		
747 <i>Iris Pseudacorus</i> in Landscape with reflections.	A		
<b>AMARYLLIDACEÆ.</b>			
751 <i>Narcissus Pseudo-Narcissus</i> : Daffodil.	B		
752 <i>Galanthus nivalis</i> : Snowdrop.	A		
753 <i>Galanthus nivalis</i> : Snowdrop.	A		
754 <i>Galanthus nivalis</i> with bulb and rootlets: Snowdrop.	B		
<b>DIOSCOREACEÆ.</b>			
758 <i>Tamus communis</i> : Black Bryony.	B		
<b>LILIACEÆ.</b>			
761 <i>Ruscus aculeatus</i> : Butcher's Broom.	B		
762 <i>Polygonatum multiflorum</i> : Solomon's Seal.	B		
763 <i>Maianthemum bifidum</i> : May Lily.	A		
764 <i>Convallaria majalis</i> : Lily of the Valley.	A		
765 <i>Allium ursinum</i> : Garlic, bed of.	A		
766 <i>Allium ursinum</i> : Garlic.	B		
767 <i>Scilla non-scripta</i> : Bluebell.	A		
768 <i>Scilla non-scripta</i> : Bluebell, showing bulb.	A		
769 <i>Fritillaria Meleagris</i> : Snakeshead closed.	B		
770 <i>Fritillaria Meleagris</i> : Snakeshead open.	B		
771 <i>Gagea lutea</i> : Yellow Star of Bethlehem.	A		
772 <i>Colchicum autumnale</i> : Autumn Crocus.	A		
773 <i>Colchicum autumnale</i> : Autumn Crocus.	B		

All Shades may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section  
L.S.—Longitudinal Section.

Section BB 19—British Flora—Continued.

774 <i>Narthecium ossifragum</i> : Bog Asphodel.	A
775 <i>Narthecium ossifragum</i> : Bog Asphodel.	B
776 <i>Paris quadrifolia</i> : Herb Paris.	A
777 <i>Paris quadrifolia</i> : Herb Paris, showing roots.	B

**JUNCACEÆ.**

784 <i>Juncus maritimus</i> : Sea Rush.	B
785 <i>Juncus acutus</i> : Sharp Rush.	A
786 <i>Juncus bulbosus</i> : Bulbous Rush.	A
787 <i>Juncus sylvaticus</i> : Wood Rush.	A
788 <i>Luzula sylvatica</i> : Gt. Woodrush.	A
789 <i>Luzula sylvatica</i> : Gt. Woodrush.	B
790 <i>Luzula campestris</i> : Field Woodrush.	A

**TYPHACEÆ.**

795 <i>Typha latifolia</i> : Reed Mace.	A
796 <i>Typha latifolia</i> : Reed Mace.	B
797 <i>Sparganium erectum</i> : Bur-reed.	B
798 <i>Sparganium simplex</i> : Smaller Bur-reed.	B

**ARACEÆ.**

801 <i>Arum maculatum</i> : Cuckoo-pint.	A
802 <i>Arum maculatum</i> : Cuckoo-pint.	B
803 <i>Arum maculatum</i> : Cuckoo-pint, spadix.	B
804 <i>Arum maculatum</i> : Cuckoo-pint, fruit.	B

**LEMNACEÆ.**

806 <i>Lemna minor</i> : Common duckweed.	B
807 <i>Lemna trisulca</i> : Ivy-leaved duckweed.	B
808 <i>Lemna gibba</i> : Gibbous duckweed floating.	B
809 <i>Lemna polyrrhiza</i> : Greater duckweed, floating.	B

**ALISMACEÆ.**

810 <i>Alisma Plantago</i> : Water Plantain.	A
811 <i>Sagittaria sagittifolia</i> : Arrowhead.	A
812 <i>Butomus umbellatus</i> : Flowering Rush.	A
813 <i>Butomus umbellatus</i> : Flowering Rush.	B

**NAIADACEÆ.**

816 <i>Triglochin maritimum</i> : Sea Arrowgrass.	A
817 <i>Potamogeton natans</i> : Broad Pondweed.	A
818 <i>Potamogeton polygonifolius</i> : Floating.	A

**CYPERACEÆ.**

818a <i>Eleocharis palustris</i> : Creeping Scirpus.	A
819 <i>Eleocharis palustris</i> : Creeping Scirpus.	B
820 <i>Scirpus cespitosus</i> : Tufted Scirpus.	A
821 <i>Scirpus lacustris</i> : Lake Scirpus.	A
822 <i>Scirpus maritimus</i> : Sea Scirpus.	A
823 <i>Eriophorum angustifolium</i> : Cotton Sedge.	A
824 <i>Eriophorum angustifolium</i> : Cotton Sedge.	B
825 <i>Carex dicica</i> : Dioecious Sedge.	A
826 <i>Carex vulpina</i> : Fox Sedge.	A
827 <i>Carex cespitosa</i> : Tufted Sedge.	B
828 <i>Carex pendula</i> : Pendulous Sedge.	A
829 <i>Carex flava</i> : Yellow Sedge.	A
830 <i>Carex acutiformis</i> : Marsh Sedge.	A

**GRAMINEÆ.**

837 <i>Phalaris canariensis</i> : Canary Grass.	A
838 <i>Phalaris arundinacea</i> : Reed Grass in Swamp.	A
839 <i>Alopecurus pratensis</i> : Meadow Foxtail.	B
840 <i>Phleum pratense</i> : Timothy Grass.	B
841 <i>Agrostis alba</i> : Florin Grass.	A
842 <i>Ammophila arenaria</i> : Marram Grass.	B
843 <i>Holcus lanatus</i> : Woolly Holcus.	A
844 <i>Holcus lanatus</i> : Woolly Holcus.	B
845 <i>Cynosurus cristatus</i> : Crested Dog's Tail.	B
846 <i>Molinia coerulea</i> : Purple Molinia.	A
847 <i>Dactylis glomerata</i> : Cock's-foot Grass.	A
848 <i>Dactylis glomerata</i> : Cock's-foot Grass.	B
849 <i>Poa trivialis</i> : Roughish Poa.	B
850 <i>Glyceria aquatica</i> : Reed Grass.	A
851 <i>Bromus asper</i> : Hairy Brome.	B
852 <i>Lolium perenne</i> : Rye Grass.	A
853 <i>Lolium perenne</i> : Rye Grass.	B
854 <i>Agropyron repens</i> : Couch Grass.	A
855 <i>Nardus stricta</i> : Mat Grass.	A
856 <i>Elymus arenarius</i> : Lyme Grass.	B

Section BB 20—BRITISH FLORA FROM ILLUSTRATIONS

principally from Sowerby :

Almost the whole of these illustrations are available as Slides, price 1/- each plain, 2/6 each coloured.

As, however, we have a large stock of these Slides, many of them coloured, we are offering them whilst they last, at the following low rates :

Plain Slides, 6d. each. Coloured Slides 1/- each.

Any *in stock* may be had on hire.

Section BB 21—FOREST TREES.

A fine series of photographs, including many new ones.

Plain Slides 1/3 each. Coloured, where suitable, 3/- each.

**TILIACEÆ.**

1 Lime, winter, group.
2 Lime, summer, group.
3 Lime, hole.
4 Lime, winter buds.
5 Lime, opening buds.
6 Lime, flowering branch.
7 Lime, fruiting branch.
8 Lime, branch in full leaf, leaf mosaic.

**AQUIFOLIACEÆ.**

9 Holly tree, winter.
-----------------------

10 Holly, flowering branch.
11 Holly, branch with berries.

**ACERACEÆ.**

12 Sycamore, winter.
13 Sycamore, summer.
14 Sycamore, bole.
15 Sycamore, twig with winter buds.
16 Sycamore, twig with terminal buds, large.
17 Sycamore, opening buds.
18 Sycamore, flowers and leaves.
19 Sycamore, fruit and leaves.

Slides Toned to an Artistic Brown Shade cost 6d. each, or 4/6 per dozen extra.

Section BB 21—Forest Trees—Continued.

- 20 Sycamore, flowering and fruiting branches.  
 21 Sycamore, seedlings in wood.  
 22 Maple, summer.  
 23 Maple, bole.  
 24 Maple, leaves and fruit.
- ROSEACEÆ.**
- 25 Rowan fruit and leaves.  
 26 Crab Apple.  
 27 Hawthorn, winter.  
 28 Hawthorn, flowers.  
 29 Almond twig in flower.
- CAPRIFOLIACEÆ.**
- 30 Elder, in fruit, near view.
- OLEACEÆ.**
- 31 Ash, winter.  
 32 Ash, summer.  
 33 Ash, bole.  
 34 Ash, opening buds.  
 35 Ash, flowers.  
 36 Ash, leaves and fruit.  
 37 Weeping Ash, winter.  
 38 Ash bole, cork formation over wound.
- URTICACEÆ.**
- 44 Elm tree, winter.  
 45 Elm group, summer.  
 46 Elm, bole.  
 47 Elm, opening buds.  
 48 Elm, male flower, enlarged.  
 49 Elm, female flower, enlarged.  
 50 Elm, branch leaf mosaic.  
 51 Elm, leaves and fruit.  
 52 Wych Elm, winter.  
 53 Wych Elm, summer.  
 54 Wych Elm, fruiting branch.
- CUPULIFERÆ.**
- 60 Silver Birch, winter.  
 61 Silver Birch, summer.  
 62 Silver Birch, group, winter.  
 63 Silver Birch, group, summer, New Forest.  
 64 Silver Birch, bole.  
 65 Silver Birch, bole, showing Bark Shedding.  
 66 Silver Birch, winter buds, scaly, B. alba, hairy, B. pubescens.  
 67 Silver Birch, fruiting branch.  
 68 Silver Birch, winter, with Witch's Broom.  
 69 Silver Birch, winter, with Witch's Broom, larger.
- 75 Alder, winter.  
 76 Alder, summer.  
 77 Alder, bole.  
 78 Alder, male and female catkins.  
 79 Alder, young and old fruit.  
 80 Hornbeam, winter.  
 81 Hornbeam, summer.  
 82 Hornbeam, bole.  
 83 Hornbeam, opening.  
 84 Hornbeam, male flowers, enlarged.  
 85 Hornbeam, male and female flowers.  
 86 Hazel, flowering branch.  
 87 Hazel, fruiting branch.  
 88 Oak, winter.  
 89 Oak, same tree, summer, specially made to "dissolve." (Coloured) 6/- pair.  
 90 Oak, bole; a fine old Oak.  
 91 Old Oak trees and Bracken, showing boles, New Forest.  
 92 Oak, burrs on stem.  
 93 Oak struck by lightning, winter.  
 94 Oak, opening buds of.  
 95 Oak, flowers and galls.  
 96 Oak, male and female flowers.  
 97 Oak, seedling germinating, with root.  
 98 Oak, seedling, cotyledons, and root.
- 99 Oak, seedling, cotyledons, first foliage and leaves.  
 100 Oak, seedling, cotyledons and leaves fully developed.  
 101 Turkey Oak, winter.  
 102 Turkey Oak, summer.  
 103 Horse Chestnut, winter, group.  
 104 Horse Chestnut, summer, group, in flower.  
 105 Horse Chestnut, bole.  
 106 Horse Chestnut, tree in bud.  
 107 Horse Chestnut, opening buds, various stages.  
 108 Horse Chestnut, flower and leaves.  
 109 Horse Chestnut, fruit.  
 110 Horse Chestnut, Leaf Scar.  
 111 Horse Chestnut, terminal bud, greatly enlarged.  
 112 Horse Chestnut, leaves.  
 113 Horse Chestnut, leaf fall.  
 114 Horse Chestnut, opening flower bud.  
 115 Horse Chestnut, single flower, greatly enlarged.  
 116 Spanish Chestnut, summer.  
 117 Spanish Chestnut, bole.  
 118 Spanish Chestnut, fruiting branch.  
 119 Beech, winter.  
 120 Beech, summer.  
 121 Beech, bole.  
 122 Beech, avenue in winter.  
 123 Beech, opening buds, various stages.  
 124 Beech, leaves and flowers.  
 125 Beech, leaves and fruit.  
 126 Beech, young flowers.  
 127 Tulip Tree, flowers and leaves.  
 128 Plane Tree, fruit and leaves.  
 129 Plane Tree, leaf fall.
- SALICACEÆ.**
- 130 Willow, winter.  
 131 Willow, summer.  
 132 Willow, beside stream, summer.  
 133 Willow, old pollarded, summer.  
 134 Willow, tree showing catkins.  
 135 Willow, male catkins, larger.  
 136 Willow, male catkins, catkins greatly enlarged.  
 137 Willow Tree, female, catkins larger.  
 138 Willow Tree, female, catkins greatly enlarged.  
 139 Willow Tree in fruit.  
 140 White Poplar, winter.  
 141 White Poplar, summer.  
 142 White Poplar, bole.  
 143 White Poplar, winter buds.  
 144 White Poplar, opening buds.  
 145 White Poplar, leaves, upper and under surface.  
 146 White Poplar, catkins.  
 147 White Poplar, fruit.  
 148 Black Poplar, winter.  
 149 Black Poplar, summer.  
 150 Black Poplar, bole.  
 151 Black Poplar, winter buds.  
 152 Black Poplar, opening buds.  
 153 Black Poplar, male catkins.  
 154 Black Poplar, male catkins, enlarged.  
 155 Black Poplar, female catkins.  
 156 Black Poplar, female catkins, enlarged.  
 157 Black Poplar, in fruit.  
 158 Black Poplar, fruit in berry stage.  
 159 Black Poplar, ripe fruit.
- CONIFERÆ.**
- 160 Yew, male flowers.  
 161 Yew, branch with fruit.  
 162 Scotch Fir, P. sylvestris.  
 163 Scotch Fir, life cycle (diagram).  
 164 Scotch Fir, tree isolated.

Slides Toned to an Artistic Brown Shade cost 6d. each, or 4/6 per dozen extra.

Section BB 21—Forest Trees—Continued.

- |                                                           |                                                                                   |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------|
| 165 Scotch Fir, group, Delamere Forest.                   | 184 Araucaria, male cones.                                                        |
| 166 Scotch Fir, another group.                            | 185 Araucaria, ripe cones.                                                        |
| 167 Scotch Fir, winter.                                   | 186 Araucaria, branch covered with hoar frost.                                    |
| 168 Scotch Fir, branch with female cones, October.        |                                                                                   |
| 169 Scotch Fir, Ovulate and Staminate branches            |                                                                                   |
| 170 Stone Pine, Pinus pinea, cones.                       |                                                                                   |
| 171 Spruce, group, New Forest.                            |                                                                                   |
| 172 Spruce, Picea Smithiana, cones.                       |                                                                                   |
| 173 Silver Fir (Abies nobilis), branch with male catkins. |                                                                                   |
| 174 Scots Pine and Silver Birch.                          |                                                                                   |
| 175 Larch, winter.                                        |                                                                                   |
| 176 Larch, summer.                                        |                                                                                   |
| 177 Larch, on hillside.                                   |                                                                                   |
| 178 Larch, male and female flowers.                       |                                                                                   |
| 179 Larch, female flowers, enlarged.                      |                                                                                   |
| 180 Larch, branch with young cones.                       |                                                                                   |
| 181 Cedar of Lebanon.                                     |                                                                                   |
| 182 Araucaria, summer.                                    |                                                                                   |
| 183 Araucaria, winter, snow scene.                        |                                                                                   |
|                                                           | <b>WINTER BUDS.</b>                                                               |
|                                                           | 187 Twigs of—1, Horse Chestnut; 2, Sycamore; 3, Ash; 4, Elder; 5, Plum.           |
|                                                           | 188 Twigs of—1, Lime; 2, Alder; 3, Plane; 4, Ash.                                 |
|                                                           | 189 Winter Buds—1 and 2, Plum; 3 and 4, Cherry; long and dwarf twigs.             |
|                                                           | 190 Winter Buds—1 and 2, Apple; 3 and 4, Pear; long and dwarf twigs.              |
|                                                           | 191 False Terminal Buds—1, Birch; 2, Elm; 3, Lime; 4, Willow; 5, Hazel; 6, Beech. |
|                                                           | 192 Winter Buds of—1, Poplar; 2, Willow; 3, Oak.                                  |
|                                                           | 193 Winter Buds, Poplars—1, Black; 2, White; 3, Aspen; 4, Lombardy.               |
|                                                           | 194 Twigs with opposite Buds—1, Horse Chestnut; 2, Maple; 3, Lilac; 4, Sycamore.  |

Section BB 22—TIMBERS AND WOOD SECTION.

Cross-sections of portions of Tree, with bark. Plain photographs only, 1/3 each.

- |                                                  |                                                             |   |
|--------------------------------------------------|-------------------------------------------------------------|---|
| 1 Oak, English, Cross Section Timber.            | 25 Lime, Wood, T.S., x 15.                                  | M |
| 2 Ash, English, Cross Section Timber.            | 26 Holly, Wood, T.S., x 60.                                 | M |
| 3 Beech, English, Cross Section Timber.          | 27 Pear, Wood, T.S., x 25.                                  | M |
| 4 Elm, English, Cross Section Timber.            | 28 Walnut, Wood, T.S., x 25.                                | M |
| 5 Lime, English, Cross Section Timber.           | 29 Box, Wood, T.S., x 60.                                   | M |
| 6 Silver birch, English, Cross Section Timber.   | 30 Horse-chestnut, Wood, T.S., x 60.                        | M |
| 7 Yew, English, Cross Section Timber.            | 31 Yew, Wood, T.S., x 60.                                   | M |
| 8 Pear, English, Cross Section Timber.           | 32 Yew (tangential) L.S., Wood, T.S.,                       | M |
| 9 Horse-chestnut, English, Cross Section Timber. | 33 Acacia (Robinia), Wood, T.S., x 15.                      | M |
| 10 Mulberry, English, Cross Section Timber.      | 34 Larch, Wood, T.S., x 60.                                 | M |
| 11 Acacia, English, Cross Section Timber.        | 35 Hornbeam, Wood, T.S., x 25.                              | M |
| 12 Lignum vitae, Jamaica, Cross Section Timber.  | 36 Willow, Wood, T.S., x 60.                                | M |
| 13 Scots fir, English, Cross Section Timber.     | 37 Tulip Tree, Wood, T.S., x 25.                            | M |
| 14 Larch, English, Cross Section Timber.         | 38 Mulberry, Wood, T.S., x 25.                              | M |
| 15 Spruce fir, Norway, Cross Section Timber.     | 39 Pencil cedar, Wood, T.S., x 15.                          | M |
| 16 Cedar of Lebanon, Cross Section Timber.       | 40 Cedar, Wood, T.S., x 60.                                 | M |
|                                                  | 41 Spruce fir, Norway, Wood, T.S., x 25.                    | M |
|                                                  | 42 Mahogany, Honduras, Wood, T.S., x 15.                    | M |
|                                                  | 43 Walnut, American, Wood, T.S., x 15.                      | M |
|                                                  | 44 Pine, Wood, T.S. (resin ducts and annual rings).         | M |
|                                                  | 45 Pine, tangential, long section (bordered pits in T.S.).  | M |
|                                                  | 46 Pine, radial long section (bordered pits, Surface view). | M |
|                                                  | 47 Norway Spruce, Wood, T.S., x 100.                        | M |
|                                                  | 48 Norway Spruce, Tangential Wood, L.S., x 100.             | M |
|                                                  | 49 Norway Spruce, Radial Wood, L.S., x 100.                 | M |

PHOTOMICROGRAPHS OF CROSS-SECTIONS OF TIMBERS.

- |                                |   |
|--------------------------------|---|
| 17 Oak, Wood, T.S., x 15.      | M |
| 18 Ash, Wood, T.S., x 25.      | M |
| 19 Elm, Wood, T.S., x 15.      | M |
| 20 Wych elm, Wood, T.S., x 15. | M |
| 21 Birch, Wood, T.S., x 15.    | M |
| 22 Beech, Wood, T.S., x 15.    | M |
| 23 Sycamore, Wood, T.S., x 15. | M |
| 24 Plane, Wood, T.S., x 15.    | M |

We can supply Slides of most of the Illustrations in Kerner and Oliver's Natural History of Plants.

**Section BB 23—BRITISH PLANT ASSOCIATIONS.**

Plain Slides 1/6 each. Coloured Slides, where suitable, 3/- each

An "association" is a community of plants occupying a definite habitat, with constant dominants and definite floristic composition.



46—Open Association of Marram Grass on Shifting Dunes.

The slides comprising this Section are from a unique series of photographs by **Mr. W. B. Crump, M.A.** The list has been considerably extended since the last issue by the addition of more than one hundred new slides. The vegetation of the chalk and limestone and of sandy soils is illustrated much more fully than was possible before. With one or two exceptions, all aspects of **English Vegetation** are now adequately illustrated, and the examples are drawn from twenty counties. Many of Mr. Crump's photographs have been used to illustrate the original memoirs on British Vegetation. The set now added of British Elms and Poplars (under "Hedgerows") corresponds exactly with the latest authority, the *Cambridge British Flora*, for the Editor (Dr. C. E. Moss) selected the specimens photographed.

The arrangement of the Section follows generally the plan of **Types of British Vegetation**, edited by A. G. Tausley, M.A., but a renumbering of the slides has been necessary owing to the growth of the Section.

In reading the description of individual Slides note should be taken of the headings under which they are classified.

**MARITIME ASSOCIATIONS.***Salt Marsh.*

- 1 Open Association of *Salicornia annua*—Norfolk.
- 2 *Salicornia radicans* (mat) and *S. annua*—Norfolk.
- 3 Open Association of *Suaeda maritima* and mats of *Salicornia radicans*—Norfolk.
- 4 *Aster Tripolium*, *Glyceria mar.* on deep mud—Norfolk.
- 7 Meadow aspect and salt pans—Norfolk.

- 8 Sea Thrift in flower in May—Norfolk.
- 9 Sea Lavender in flower in August—Norfolk.
- 10 *Atriplex portulacoides* (bushes) with *Salicornia* spp.—Norfolk.
- 11 *Suaeda frutescens* above and *A. portulacoides* in marsh—Norfolk.
- 17 *Spartina Townsendi*—Hants.
- 18 *Spartina Townsendi*—Hants.
- 16 A creek at low tide (*Spartina*)—Hants.
- 19 *Zostera nana* (prostrate), *Spartina*—Hants.

All Slides may be had **Plain**—unless otherwise stated.  
**P**—Photograph. **D**—Drawing or Diagram. **M**—Photomicrograph. **T.S.**—Transverse Section.  
**L.S.**—Longitudinal Section.



Section BB 23—British Plant Associations—Continued.

20 *Inula crithmoides* and *Agropyron pungens* at edge of marsh—Hants.

*Sand Dunes.*

- 41 *Agropyron junceum* forming lines of dunes on a shingle beach—Norfolk.  
 42 Lines of *Saltwort* and *Agropyron* on a sandy foreshore—Somerset.  
 43 Low front dunes formed by *Agropyron*—Norfolk.  
 45 *Marram grass* and *Saltwort*—Wales.  
 46 *Marram grass*—Wales.  
 47 *Marram* on the crest—Wales.  
 48 Ridge upon *Ridge*—Wales.  
 49 *Lyme grass*, *Sea Holly*—Norfolk.  
 50 *Cynoglossum* off. (*Hounds-tongue*)—Som.  
 51 Front line of *Marram dunes*—Lancashire.  
 52 Larger dunes from rear—Lancashire.  
 54 *Salix repens* and *Marram*—Lancashire.  
 55 A *Wind Gap*: *S. repens*—Lancashire.  
 56 A Fan of blown sand—Lancashire.  
 61 *Sea Buckthorn* (*Hippophae*) behind *Marram dunes*—Lincolnshire.  
 62 *Sea Buckthorn* in valley, *Elders* on crest of ridge—Lincolnshire.  
 63 *Solanum Dulcamara* amongst *Hippophae*—Lincolnshire.  
 64 Heath: *Calluna* and *E. cinerea* replacing *Marram*—Dorset.  
 66 *Dune Slack*: *Salix repens*, *Parnassia*—Lancs.  
 67 A *Slack*: *Parnassia palustris*—Lancashire.  
 69 *Fœtid Iris* (*hack*) *Centuary* (*fore*): *Juncus* in marsh—Somerset.  
 71 *Dune Marsh*: *Juncus*—Wales.  
 72 *Marsh*: *Euphorbia Paralias*, *Iris fœtidissima* behind—Somerset.  
 73 *Marsh*: *Juncus glaucus*, *Scirpus maritimus* in middle distance—Somerset.

ASSOCIATIONS IN WATER.

- 76 Submerged: *Stratiotes* with *Typha angustifolia*—Norfolk.  
 77 Submerged: *Stratiotes Aloides*—Norfolk.  
 78 Submerged: *Water Violet*—Suffolk.  
 80 Floating: *Polygonum amphibium*, *Sparanium*—Yorkshire.  
 81 Floating: *Ranunculus fluitans*—Somerset.  
 82 *Glyceria fluitans* in a pond—Yorkshire.  
 84 A "Rhine" and *Osier* bed: *Lythrum*, *Sagittaria*, *Lemna*—Somerset.  
 85 *Yellow Flag*, *Iris Pseudacorus*—Somerset.  
 86 *Pollard Willows* on the Levels—Somerset.  
 87 A *Lowland Stream*: *Willow*, *Ash*, *Elm*—Som.  
 88 *River bank*: *Alder*, *Angelica*—Yorkshire.  
 89 *Zones*: *Polygonum*; *Alisma*; *Sparanium*, *Glyceria*; *Salix cinerea*—Yorkshire.  
 91 *Reed Swamp*: *Epiobium hirsutum*, *Glyceria aquatica*—Yorkshire.  
 92 *Open Reed Swamp*: *Scirpus lacustris*, *Nymphaea alba*—Norfolk.  
 93 *Closed Reed Swamp*: *Scirpus lacustris*, *Phragmites*.  
 95 *Open and closed Reed Swamp*—Norfolk.  
 96 *Bulrush*, *Typha ang.*—Norfolk.  
 97 *Marsh Pasture*: *Juncus*; *Mentha*, *Rumex Hydrolap.* in ditch—Norfolk.  
 98 *Cutting "holders"*, *Scirpus*—Norfolk.  
 99 *Reed Swamp*: *Cladium Mariscus*, *Phragmites*, *Eupatorium*—N. Lancashire.  
 100 *Lake Margin*: *Juncus inflexus*—Lancs.  
 101 *Calcareous Marsh*: *Parnassia*—N. Lancs.  
 102 A *Fen River*: *Carex riparia*, *Glyceria*; *Salix alba*, *S. fragilis*—Suffolk.

ASSOCIATIONS ON PEAT.

*Fen.*

- 115 *Cutting marsh hay* on fen—Norfolk.

- 116 *Loading marsh hay*—Norfolk.  
 117 *Cutting fen peat*—Cambridgeshire.  
 118 *Carr forming on Fen*: *Rhamnus Frangula* amongst *Phragmites*—Cambridgeshire.  
 119 *Swamp Carr*: *Alder* and *Willow* with *Phragmites*—Norfolk.

*Lowland Heath and Moss.*

- 125 *Aquatics* in a *Peat Cutting*—Somersetshire.  
 126 *Site of a recent mere*: *Molinia*, *Eriophorum*, *Cranberry*, *Sundew*—Cheshire.  
 127 *Site of a recent mere*: *Cotton-grass* in fruit—Cheshire.  
 128 *Peat-bog from mere*: *Myrica*, *Salix*, *Phragmites*—Cheshire.  
 129 *Phragmites* on a heath—Wales.  
 130 *Myrica*, *Eriophorum* in bog; *Molinia*, *Calluna* on bank—Somersetshire.  
 131 *Eriophorum ang.* in fruit—Somersetshire.  
 132 *Peat cuttings*: *Isles*, *Ruckles*—Somerset.  
 133 *Turf Moor*; *peat*, *pin*es—Somersetshire.  
 134 *Peat cutting and stacks*—Cheshire.  
 135 *Myrica*, *Molinia* bog with *Lastrea Thelypteris*—Somersetshire.  
 136 *Calluna Heath*; *Myrica*, *E. Tetralix* fringe: *Molinia*, *Myrica*, *Salix* *peat bog*—Dorset.  
 N.B.—Nos. 65, 246, and 136 show three stages of succession.  
 137 *Myrica*, *Erica Tetralix*—Norfolk.  
 138 *Calluna Heath*; *Molinia* on edge of mere—Cheshire.  
 139 *Heath*: *Gorse* and *Heather*—Wales.  
 140 *Windblown Birches* on *Heath*—Wales.  
 141 *Windblown Birches* on *Heath*—Wales.  
 142 *Heather* dominant on a "moss"—Cheshire.  
 143 *Molinia* dominant on a moss—Cheshire.

*Heather Moor.*

- 151 *Heather Moor* in *September*—Yorkshire.  
 152 *Heather Moor slopes*—Yorkshire.  
 153 *Heather Moor edge*—Yorkshire.  
 154 *Heather* and *Gorse*, *Cleveland*—Yorkshire.  
 155 *Heather* and *Gorse* over *chert* on *limestone plateau*—Derbyshire.  
 157 *Molinia* dominant; *Heather* on *ridge*—Yorkshire.  
 158 *Molinia* dominant—Yorkshire.  
 159 *Ulex Gallii* and *Heather* in fl.—Yorkshire.  
 164 *Trientalis europæa* amongst *Bilberry* and *Nardus*—Yorkshire.

*Cotton-grass Moor (Eriophorum vaginatum.)*

- 171 *Heather* following *stream bank*—Yorks.  
 172 *Heather* around *Cotton-grass bog*—Yorks.  
 174 *Stream cutting* through *peat* and *shale*—Yorkshire.  
 176 *Cotton-grass Moor* in *June*—Yorkshire.  
 177 *Peat Bog*: *Eriophorum angustifolium* and *E. vaginatum*—Yorkshire.  
 178 A *Peat Bog* *Tarn*—Yorkshire.  
 179 *Cloudberry* and *Cotton-grass*—Yorkshire.

*Bilberry Moor and Retrogressive Moor.*

- 191 *Bilberry* on *peat-hags*, *Cloudberry*, *Cotton-grass*, 1,700ft.—Yorkshire.  
 192 *Bilberry Summit*, 1,700ft.—Lancashire.  
 193 *Peat hags* with *mats* of *Bilberry*—Yorks.  
 194 *Peat hags* with *mats* of *Empetrum*—Yorks

ASSOCIATIONS ON SANDY SOILS

(on *Bunter*, *Lower Greensand*, and *Ashdown Sand*).

- Oak Wood of Quercus Robur.*  
 201 *Oak Wood*: *Q. Robur*, *Bracken*, *New Forest*—Hampshire.  
 202 *Birches*, *Bracken*, *New Forest*—Hants.  
 203 *Beeches*, *New Forest*—Hampshire

Sides Toned to an Artistic Brown Shade cost 6d. each, or 4/6 per dozen extra.

Section BB 23—British Plant Associations—Continued.

- 204 Aged Beeches on greensand—Som.-Wilts.  
 205 Quercus Rohur, Burnham—Bucks.  
 206 Pollard Beech, Burnham—Bucks.  
 207 Aged Beeches, Burnham—Bucks.  
 208 Q. Rohur, Betula alba, Bracken, and Hair-grass, Delamere—Cheshire  
 209 Q. Rohur, Sweet Chestnut, Delamere—Cheshire.  
 210 Sweet Chestnuts, Bracken, Delamere—Ches.  
 211 Q. Rohur, Hazel copse—Surrey.  
 212 Q. Rohur, Betula alba, Pteris, Forest Ridge—Sussex.  
 213 Q. Rohur, Birch copse, Pteris, Forest Ridge—Sussex

*Oak Birch Heath.*

- 221 Q. Rohur, Oak scrub, Pteris—Surrey.  
 222 B. alba, Oak scrub, Ling and Bilberry—Surrey.  
 223 Pine in Oak-hitch Heath; Hair-grass, Ling—Surrey.  
 224 Forest Ridge: Birch and Bracken—Sussex.  
 225 Forest Ridge: Gorse and Bracken—Sussex.

*Lowland Heaths.*

- 231 Heath: Heather and Gorse—Norfolk.  
 232 Heath: Heather, Gorse, Pines—Norfolk.  
 233 Heath: Bramble and Gorse—Norfolk.  
 234 A Gravel Pit: Pine, Birch—Norfolk.  
 237 Ulex nanus and Hair-grass on a hum—Surrey.  
 238 Ulex europæus, Erica cinerea, Heather, Hair-grass—Surrey.  
 239 Broom, E. cinerea, Heather, Pines—Surrey.  
 241 Breckland: Lichen Heath with annuals; Populus serotina and Pines—Suffolk.  
 242 Breckland: Cerastium arvense, Myosotis collina and other Ephemerals; Calluna and Ulex heyond—Suffolk.  
 243 Breckland: Carex arenaria under Pines and Oaks—Suffolk.  
 244 Breckland: Carex arenaria sward on light sand, inland; Calluna—Suffolk.  
 246 Coast Heath on sand; Calluna and E. cinerea—Dorset.

**ASSOCIATIONS ON SILICEOUS SOILS**

(Carboniferous and Older Rocks).

*Woodlands.*

- OAK WOOD OF QUERCUS SESSILIFLORA.  
 251 Oak Wood in a Clough: Open aspect, varied undergrowth—Yorkshire.  
 252 Oak Wood with Sycamores—Yorkshire.  
 253 A Clough Wood in Octoher—Yorkshire.  
 254 Oaks and Bracken—Yorkshire.  
 255 Shrubby Undergrowth in winter: Hazel, Rose—Yorkshire.  
 256 Spring Carpet: Bluebells—Yorkshire.  
 257 Bluebells—Yorkshire.  
 258 Summer Undergrowth: Foxglove, Male Fern—Yorkshire.  
 259 Oak Wood: Lastrea dilatata—Yorkshire.  
 260 Oak Wood: Lady Fern—Yorkshire.  
 261 Wood Marsh: Carex pendula—Yorkshire.  
 262 Wood Marsh: Garlic—Yorkshire.  
 263 Lamium Galeobdolon: Garlic—Yorkshire.  
 264 Marsh: Sweet Woodruff—Yorkshire.  
 265 Myosotis sylvatica—Yorkshire.  
 266 Marsh: Wood Horsetail—Yorkshire.  
 267 Wood Rush: Luzula sylvatica—Yorkshire.  
 271 Bluebells in a rocky wood—Yorkshire.  
 272 Dry Wood: Hair-grass, Bracken—Yorkshire.  
 274 Upland Oak Wood: Oaks, Birch, Holly, Bilberry, Hair-grass—Yorkshire.  
 275 Dry Oak Wood with Conifers: Bilberry, Bracken, Heather—Yorkshire.

- 276 Dry Rocky Oak Wood: Bilberry bushes—Yorkshire.  
 277 Upland Wood: Ulex Gallii and Calluna in flower—Yorkshire.  
 278 Spruce, Scotch and Austrian Pines in Oak Wood; Heather on path edge—Yorkshire.

*BIRCH WOOD OF BETULA TOMENTOSA.*

- 282 Birches, Bracken, in Octoher—Yorkshire.  
 283 Bluebells and Holcus mollis—Yorkshire.  
 284 Birch, Cherry, Bluebells—Yorkshire.  
 285 Birch and Bramble—Yorkshire.  
 286 Birch swamp: Deschampsia caespitosa and Juncus—Yorkshire.  
 287 Birch swamp: Deschampsia caespitosa and Juncus—Yorkshire.

*Heath Pasture (Siliceous Pasture).*

- 291 An Upland Valley: Birch scrub; limit of cultivation—Cumberland.  
 292 Mountain Ash, Bracken—Yorkshire.  
 293 The Upper Clough—Yorkshire.  
 294 Clough Scrub and Swamp: Birch, Willow, Juncus—Yorkshire.  
 295 Clough Swamp: Salix cinerea, Orchis Juncus, Desch. caesp.—Yorkshire.  
 296 Clough swamp: Seliges, Juncus, Angelica, Spirea, Cnicus—Yorkshire.  
 297 Juncus and Sphagnum bog—Yorkshire.  
 298 Swamp: Juncus, Equisetum, Cotton-grass, Lychnis Flo-cuculi—Yorkshire  
 299 Dripping shale bank—Yorkshire  
 301 Bracken slopes and stack—Yorkshire.  
 302 Gorse on moor edge—Yorkshire.  
 303 The Quantocks: Gorse, Bracken, Erica cinerea, Birch—Somersetshire.  
 304 The Rush Harvest—Cheshire.  
 305 Grass slopes: Hair-grass, Molinia: Scrub below—Yorkshire.  
 306 Hill summits of Nardus (1,800ft.), Molinia in foreground—Cheshire.  
 317 A Moorland Valley: Grasses with Heather—Yorkshire.  
 300 Bracken in shelter of clough—Yorkshire.  
 310 Gentiana Pneumonanthe amongst Molinia, Calluna—Yorkshire.

**ASSOCIATIONS ON CALCAREOUS SOILS.**

*Woodlands.*

**BEECH WOODS ON CHALK AND OOLITE**

*ESCARPMENTS*

- (North and South Downs, Chilterns, Cotswolds).  
 325 Aged Beeches on summit of Downs—Surrey.  
 326 Beech Wood on escarpment: Ash seedlings—Surrey.  
 327 Hollow Lane up N. Downs: Beech, Ash, Yew—Surrey.  
 328 Yews along old track through Beech Wood—Surrey.  
 329 Beech Hangar—Hants.  
 332 Chiltern Beech Wood: Brambles, Male Fern Oxon.  
 333 Chiltern Beech Wood: Cherry, Brambles, L. dilatata and Filix-mas—Oxon.  
 334 Chiltern Beech Wood: Bracken—Oxon.  
 335 Beech Wood: The Timber—Oxon.  
 336 Beech Wood on Cotswolds—Glos.  
 338 Ash, Whitebeam, Yew—Hants.  
 339 Ash at top of scarp—Surrey.  
 340 Box Hill: Yew, Ash, Beech, Whitebeam, Box—Surrey.  
 341 Box Hill: Box under Ash—Surrey.  
 343 Yew Wood in Kingley Vale, Juniper foreground—Sussex.

Storage Cabinets for Slides in all sizes—See Cover.

Section BB 23—British Plant Associations—Continued.

- 344 Juniper killed by Yew after sheltering its seedling—Sussex.  
 345 A Yew Grove, Kingley Vale—Sussex.  
 ASH WOODS ON MOUNTAIN LIMESTONE.  
 (Mendips, Peak, Pennines).  
 351 Ash Wood in gorge—Somerset.  
 352 Scar Wood: Hazel Scrub—Yorkshire.  
 353 Ashes, Wych Elm, Mercury—Derby.  
 354 Carpet of Mercury, Bugle, Primrose, Burdock—Somerset.  
 355 Garlic in stream bed—Somerset.  
 356 Ash, Sweet Cicely, June—Yorkshire.  
 357 Hawthorn in flower, Lime—Somerset.

- ASH-OAK WOODS ON CALCAREOUS MARLS AND BOULDER CLAYS, CHALK AND LIMESTONE.  
 361 Quercus Robur: Hazel Copse—Camb.  
 362 Quercus Robur: Service, Ash-Hazel, Aira cespitosa—Camb.  
 363 Quercus Robur: Bracken, Circaea—Somerset.  
 364 Hazel Coppice, Mercury—Somerset.  
 365 Teasel, Burdock, Bracken—Somerset.  
 366 Cutting Ash-Hazel Copse—N. Lancs.  
 367 Larch standards, coppice cut—N. Lancs.  
 368 Quercus Robur: bark ready for tannery—Essex.  
 369 Quercus Robur: Ash Coppice cut—Essex.  
 370 Quercus Robur: Carex pendula—Essex.  
 371 Carpet of Primula veris (in flower) and P. elatior (over)—Essex.  
 372 Ash, Oak standards: Hazel, Birch, Ash Copse, Cotswolds—Glos.  
 373 Quercus Robur: Hazel Copse, Bracken—Glos.  
 374 Quercus Robur: Hazel, Elm Copse—Oxon.  
 375 Ash, Oak standards; Ash and Hazel Coppice, summit N. Downs—Surrey.

CALCAREOUS WOODS: INDIVIDUAL PLANTS.

- 381 Helleborine latifolia—Westmorland.  
 382 Deadly Nightshade (Atropa)—Westm.  
 383 Ploughman's Spikenard—Westmorland.  
 384 Daphne Laureola—N. Lancashire.  
 385 Helleborus viridis—N. Lancashire.  
 386 Helleborus foetidus—Yorkshire.  
 387 Wood Anemone in Ash Copse—N. Lancs.  
 388 Pink Campion, Lychnis—Yorkshire.  
 Calcareous Scrub and Pasture on Chalk.  
 401 Juniper scrub, elder, Chilterns—Oxford.  
 402 Yew and Juniper Scrub—Oxford.  
 403 Down Scrub: Viburnum, Lantana, Privet; Whitebeam, Dogwood—Surrey.  
 404 Juniper Down: Beech and Ash saplings in Juniper, Whitebeam—Surrey.  
 405 Beech, Ash, Whitebeam in Juniper scrub—Surrey.  
 406 War Down: Scrub—Hampshire.  
 407 Tor-grass (Brach. pinnatum) and scrub of whitebeam and yew—Surrey.  
 408 Chalk Down: Gorse—Norfolk.

On Limestone.

- 421 A Limestone Dale, Ashes—Yorkshire.  
 422 Limestone Scar: Ash Wood—Derbyshire.  
 423 Ash Scrub: Ash, Hazel, Bracken, Gorse—Somersetshire.  
 424 Ash Scrub on cliffs—Somersetshire.  
 425 Hawthorn Scrub—Derbyshire.  
 426 Upland Dale: Hawthorn scrub—Derbyshire.  
 427 Limestone Cliffs: Whitebeam—Somerset.  
 428 Pavement: Hazel scrub, Yew, Bracken, Sessleria—North Lancashire.  
 429 Juniper with Oak scrub; Sessleria, Rock-rose—Westmorland.

- 430 Oak scrub (Q. sessiliflora); Bracken—Westm.  
 431 Hazel scrub, Holly, Juniper—N. Lancs.  
 435 Scar limestone: Ash wood with Pasture above—Yorkshire.  
 436 Gordale Scar: Ash, Yews—Yorkshire.  
 437 Hawthorn on limestone scars—Yorkshire.  
 438 Yews on limestone cliffs—Yorkshire.  
 439 Limestone pavement: Sessleria—Lancashire.  
 440 Limestone pavement: Hazel—Yorkshire.  
 441 Craven sheep walks: Festuca—Yorkshire.

Individual Plants.

- 445 Limestone Rock Plants: Rockrose, Thyme, Sedum acre—North Lancashire.  
 446 Geranium pratense and Ceanothus Anthriscus—Yorkshire.  
 447 Geranium sanguineum—Yorkshire.  
 448 Primula farinosa—Yorkshire.  
 449 Limestone Polygody on screes.  
 450 Limestone Wall: Cetrach, Cotyledon, Sedum acre, etc.—Somersetshire.  
 451 Limestone Wall: Wall Rue, Black Spleenwort, Linaria Cymb.—Somersetshire.

ASSOCIATIONS ON CLAY.

Oak-Hornbeam Wood.

- 475 Q. Robur, Holly, Rubus—Middlesex.  
 477 Hornbeams, heavy shade—Middlesex.  
 478 Hornbeam coppice under Oaks—Middlesex.  
 479 Hornbeam coppice and a sapling under Q. Robur—Middlesex.

CULTURE ASSOCIATIONS.

Plantations.

- 651 Scotch Pines and Bracken—Yorkshire.  
 652 Same Pine Wood in Winter—Yorkshire.  
 653 Scotch Pine, Silver Fir—Wales.  
 654 Larch and Bracken—Somersetshire.  
 655 Beeches amongst Sycamores—Yorkshire.  
 656 Beech Wood: No undergrowth—Yorkshire.

Hedgerows.

- 571 Black Poplars (P. serotina), Ash—Cheshire.  
 572 Populus nigra (eu.) with Lombardy Poplar—Cambridgeshire.  
 573 Populus nigra (eu.) leafing in mid-May—Suffolk.  
 574 Ulmus campestris—Somersetshire.  
 575 Ulmus campestris—Oxford.  
 576 Ulmus montana—Yorkshire.  
 577 Ulmus nitens (Smooth-leaved Elm) late leafing in mid-May—Essex.  
 578 Ulmus nitens bare: U. campestris in full leaf in mid-May—Cambridgeshire.  
 579 U. sativa (Small-leaved Elm), with Dutch Elm on left—Cambridgeshire.  
 580 Ulmus hollandica (Dutch Elm)—Cambs.  
 581 Ashes on limestone—Yorkshire.  
 582 Sycamore—Yorkshire.  
 583 Sycamores on Icknield Way—Oxford.  
 584 Ash, Wych Elm; Teasel, Angelica, Flea bane—Somersetshire.  
 685 Jack by the Hedge—Yorkshire.  
 586 Primroses under Hedge—Yorkshire.  
 587 Polygody and Ivy on wall—Somersetshire.  
 588 Hazel and Mercury—Westmorland.  
 689 Dogwood in flower—Oxford.  
 690 Clematis in fruit over Yews—Sussex.  
 391 A Bird-Sown Hedge, Hawthorn, etc., from edible seeds dropped at the posts in 25 years—Oxford.

Zones of Cultivation.

- 695 Boundary of Alluvial and Wheat Zone—Som.  
 698 Haymaking on the hills—Yorkshire.

**Section BB 24—PLANT ASSOCIATIONS.**

A short series from various sources.

Plain Slides 1/6 each. Coloured, where suitable, 3/- each.

**MOORLAND.**

- 1 Gorse and Heather Association.
- 2 Scots Pine and Bracken—N. Yorkshire.
- 3 Wind blown Larches and Bracken.
- 4 Vaccinium, Ling, Bracken with Birch and Oak Wood—North Yorkshire.
- 5 Sandy Heath: Molinia, Bilberry, Erica, Calluna, Cotton Grass—Cheshire.

**WOODLAND.**

- 6 Arum, Paris, Ribes alpinum—Yorkshire.
- 7 Oakwoods in River Valley—Devonian.
- 8 Birch Scrub, with Sweet Gale, Silicious soil, Juncus, Ling—Arran.
- 9 Toothwort, Wood Anemone and Primroses.

**MARSH AND BOG ASSOCIATION.**

- 10 Sphagnum Moss, Bog Myrtle, Cotton Grass—Solway.
- 11 Sphagnum Moss, Cotton Grass, with Peat Stacks—Solway.
- 12 Cotton Grass Moor with Scots Pine.
- 13 Cotton Grass with Pools—Teasdale.
- 14 Cotton Grass, Eriophorum vaginatum, by pool.
- 15 Ranunculus Flammula in Bog.

**SCREES, &c.**

- 16 Juniper Scrub on Basalt—Yorkshire.
- 17 Scree with Prunus Spinosa—Llandulas.

**HEDGEROW ASSOCIATION.**

- 18 Foxgloves, Nettles, etc.—Ravenglass.
- 18a Roadside with Ribes alpinum—Yorks.

**AQUATIC ASSOCIATIONS.**

- 19 Scirpus lacustris, Typha, with Alder and Willow.
- 20 Phragmites with Alder and Willow.
- 21 Water Lilies, Juncus, etc., in pond.
- 22 Bntomus umbellatus in lake.
- 23 Scirpus palustris, Caltha, Hawthorn.
- 24 Polygonum amphibium, in lake.

**RIVER BANK ASSOCIATION.**

- 25 Loosestrife, Juncus and Reeds.
- 26 Reed Beds, Juncus, and Oaks.

**SAND DUNES.**

- 27 Euphorbia Paralias, Marram Grass, Thistles—Birkdale.

**Section BB|25—THE ECOLOGY OF THE VEGETATION OF BRECKLAND**

showing the action of rabbits on vegetation.

A fine series of Slides from original negatives by E. Pickworth Farrow, M.A., D.Sc. (See Journal of Ecology, Vols III., 1915, to Vol. VII. 1919.)

Plain Slides 1/6 each. Coloured, where suitable, 3/6 each

- |                                                                                                              |   |                                                                                                                                 |   |
|--------------------------------------------------------------------------------------------------------------|---|---------------------------------------------------------------------------------------------------------------------------------|---|
| 1 Map, geographical position of Breckland.                                                                   | D | 18 Valley-fen wood, valley of Lark, Quercus sessiflora, Betula alba, Pinus sylvestris, undergrowth Calluna, Rubus, Galium, etc. | P |
| 2 Breckland and surrounding district.                                                                        | D | 19 Rabbit proof cage on degenerated Calluna.                                                                                    | P |
| 3 Map of Cavenham Heath and its vegetation.                                                                  | D | 20 Transition zone Calluna heath degenerating to grass heath owing to rabbit attack.                                            | P |
| 4 Cavenham Heath, typical section through upper strata.                                                      | D | 21 Twenty metres nearer to grass heath than No. 20. Note greater deterioration of dwarf rabbit-grazed Calluna.                  | P |
| 5 Zonation on edge of Cavenham Heath, Calluna to right in valley, betula and pinus, seedlings, Salix repens. | P | 22 Rabbit attacked Calluna bush smothered by Leucobryum and Cladonia.                                                           | P |
| 6 Zonation on Cavenham Heath, Pteris, Carex arenaria in foreground.                                          | P | 23 Rabbit grazed rounded Calluna, plant smothered by Leucobryum.                                                                | P |
| 7 Orientated view on Cavenham Heath, dwarf heath grass in foreground with rabbit burrows.                    | P | 24 Biotic Zonation Breckland around isolated rabbit burrow.                                                                     | D |
| 8 As last taking exactly a year afterwards from same position, showing changes in vegetation.                | P | 25 Rabbit proof fence across S. side, Cavenham Heath, Western end.                                                              | P |
| 9 Laken Heath Warren, Rabbit burrow flora.                                                                   | P | 26 Southern rabbit-proof fence, Eastern and opposite direction of No. 25.                                                       | P |
| 10 Mildenhall Warren, Carex arenaria assn. in foreground except round rabbit burrows.                        | P | 27 Sedum acre, flowering in rabbit-proof cage on protected side of fence.                                                       | P |
| 11 Pteris growing in rabbit burrows. Prothalli will not grow on the dry heath.                               | P | 28 Galium verum, flowering in rabbit-proof cage.                                                                                | P |
| 12 Group of Pteris fronds spreading from rabbit burrow, later stage than last.                               | P | 29 Rabbit-proof cage on middle of degenerate grass heath.                                                                       | P |
| 13 Small mere on Cavenham Heath near area "4" on slide "5."                                                  | P | 30 Campanula rotundifolia and young Calluna stems inside rabbit-proof cage.                                                     | P |
| 13a Erica tetralix brushes killed through long submergence in 1912.                                          |   |                                                                                                                                 |   |
| 14 Valley-fen wood in Valley of River Lark, Alder, Ash, Birch, Phragmites, etc.                              | P |                                                                                                                                 |   |
| 15 Valley-fen wood, tributary of Lark, Alder, Black Poplar, Willow, Ash, Geum, etc.                          | P |                                                                                                                                 |   |

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section  
L.S.—Longitudinal Section.

Section BB 25—The Ecology of the Vegetation of Breckland—Continued.

- |                                                                                                                               |                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 31 Young Pinus in valley stem badly attacked by rabbits. P                                                                    | 40 Greater luxuriance of vegetation inside rabbit-proof quadrat in spring, 2nd year of experiment. |
| 32 Young Betula alba in valley with stem attacked by rabbits. P                                                               | 41 Young Calluna flowering vigorously inside quadrat, autumn, 2nd year of experiment.              |
| 33 Tuddenham Heath, small dense Carex arenaria assn. round rabbit burrows in a Calluna heath. P                               | 42 Chart of border between rhizome spreading Pteris and Calluna heath Assn. D                      |
| 34 Transition zone on edge of Carex Assn. in 33                                                                               | 43 Carex arenaria spreading by rhizome through gaps in row of Pines to grass heath beyond. D       |
| 35 Small incipient grass heath bare of Carex round individual rabbit burrow in Calluna Heath. P                               | 45 Dead fallen Pteris fronds killing Ulex bush, Hampstead Heath.                                   |
| 36 Area bare of Pteris round burrows in Pteris Assn. W. Newton Heath. P                                                       | 48 Zonation of vegetation on Breckland sand cupola.                                                |
| 37 Diagram of experimental quadrats inside rabbit-proof inclosure. D                                                          | 51 Ancient sand blasting area occupied by Campylopus. P                                            |
| 38 Large expl. quadrat (3 metres side) fenced from rabbit. P                                                                  | 53 Sand blasted area on W. Newton Heath. Rabbit-grazed hummocks of Erica tetralix. P               |
| 39 Limiting factor experiment on available water supply of protected grass heath vegetation, inside rabbit-proof inclosure. P |                                                                                                    |

Section BB 26—SOUTH AFRICAN PLANT ASSOCIATIONS.

FLATTERS & GARNETT, Ltd., beg to announce that they have been appointed sole makers of the following :

SET OF 50 LANTERN SLIDES, with Map, illustrating the Botanical regions of South Africa, in particular the Cape Province and the Karroo; prepared from Dr. R. Marloth's original negatives as published in his book "Das Kapland" [Jena, Gustav Fischer, 1908].

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- |                                                                                                                            |                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| 1 Map of Botanical Regions of South Africa.                                                                                | 22 Swampy spot on Devil's Peak, with Osmitopsis.                                                                 |
| 2 Mangroves on coast of Natal.                                                                                             | 23 Protea cynaroides on Table Mountain.                                                                          |
| 3 Sand dunes on coast, near Caledon.                                                                                       | 24 Cliffortia ruscifolia, in a ravine on Table Mountain, deformed by wind.                                       |
| 4 Boulder on coast, near Caledon, with wind shorn shrub.                                                                   | 25 The Cape Everlasting (Helichrysum vestitum).                                                                  |
| 5 Cape-Flats, near Wynberg, with Restiaceae.                                                                               | 26 Swamp on top of Table Mountain (Dovea mucronata).                                                             |
| 6 Thamnochortus spicigerus, Cape-Flats near Cape Town.                                                                     | 27 Lakelet on top of Table Mountain, which owes its existence to the periodical appearance of the "Table Cloth." |
| 7 Lake in Cape-Flats, with water lilies.                                                                                   | 28 Mountain slopes near Tulbagh, with an arborescent Aloe, viz., Aloe plicatilis.                                |
| 8 The Cape Arum (in Winter).                                                                                               | 29 The Clanwilliam cypress (Widdingtonia juniperoides).                                                          |
| 9 Proteaceae near Cape Town (Leucospermum).                                                                                | 30 Quarri landscape, near Ladysmith.                                                                             |
| 10 Protea grandiflora, on slopes of Table Mountain.                                                                        | 31 Portulacaria afra, The Spekboom, near Ladysmith.                                                              |
| 11 Pelargonium cucullatum, near Cape Town (Spring).                                                                        | 32 Cotyledon fascicularis, the Butter tree of the Colonists.                                                     |
| 12 Rhenoster bushes, near Stellenbosch.                                                                                    | 33 Aloe arborescens, near Riversdale.                                                                            |
| 13 Brunia nodiflora, on slopes, near Cape Town.                                                                            | 34 Testudinaria Elephantipes, the Elephant's foot.                                                               |
| 14 The silver tree (Leucadendron argenteum).                                                                               | 35 The bed of the Gamka River, near Fraserburgh Road (Acacia horrida, with Viscum).                              |
| 15 Succulents on cliffs above Cape Town, 1,200 ft. (Euphorbia and Stapelia.)                                               | 36 The Karrie tree (Rhus lancea).                                                                                |
| 16 Cliff of Table Mountain, with Euryops pectinatus, 2,000 feet.                                                           | 37 Euphorbia mauritanica.                                                                                        |
| 17 Streamlet on slopes of Table Mountain, 1,200 feet (Bersella).                                                           | 38 Arborescent succulents, near Laingsburg (Crassula and Cotyledon).                                             |
| 18 Wooded kloof near Cape Town, with Virgilia and Plectonias.                                                              | 39 Stony plains near Fraserburgh Road, with stunted bushes of Rhigorum trichotomum                               |
| 19 A Fern-covered cliff in a shady ravine of Table Mountain, with Disa uniflora.                                           | 40 Trichocaulon flavum, the edible "Guaap."                                                                      |
| 20 Ilex mitis (I. capensis) in a ravine of Table Mountain, with epiphytes, viz., Polypodium lanceolatum and Usnea barbata. |                                                                                                                  |
| 21 Tree ferns in a ravine of Table Mountain (Hemitelia).                                                                   |                                                                                                                  |

No-trouble Electric Illuminants for Lanterns—See Catalogue F.

**Section BB 26—South African Plant Associations—Continued.**

- |                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>41 Karroid plain, near Victoria West (Mesembrianthemum spinosum and Pentzia virgata).</p> <p>42 Euphorbia hystrix, on slopes of Roggeveid Mountains.</p> <p>43 The Roggeveid (Euryops lateriflorus).</p> <p>44 A Steppe in the Eastern Province of the Cape, with large Bulbs (ornithogalum altissimum).</p> <p>45 Schofia latifolia, with Usnea barbata, from a remnant of forest in the Eastern Province.</p> | <p>46 Tree Euphorbia, in the Eastern Province (Euphorbia tetragona).</p> <p>47 Rncepharlarctos Altensteinii, on the banks of the River Nahoe.</p> <p>48 Hill near Alcedale (Aloe speciosa and A. ferox).</p> <p>49 Bushveld, Northern Transvaal (Sclerocarya caffra).</p> <p>50 The Camelthorn (Acacia Giraffæ), Kalahari.</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Section BB 27—TROPICAL VEGETATION & ECONOMIC PLANTS.**

Many from photographs in natural surroundings. A few from specimens in Botanical Gardens, and others from illustrations such as are found in Kerner's Natural History of Plants. All are photographs unless marked "D" (drawings).

Plain Slides 1/3 each. Coloured, where suitable, 3/- each.

**PALMS.**

- 1 Palm tree, Ceylon.
- 2 Palm avenue, Ceylon.
- 3 Date Palms, Nile.
- 4 Palms, group of, India.
- 5 Palms, group of, India.
- 6 Coconut Palms.
- 7 Coconut Palm grove, Ceylon.
- 8 Coconut in its husk.
- 9 Climbing Palms, Ceylon forest.
- 10 Nikaw Palms and Tree, Ferns N.
- 11 Sago Palm.
- 12 Sago Palm, enlarged.
- 13 Talipot Palm.
- 14 Palm walk, Scilly Isles.

**TROPICAL FRUITS, &c.**

- 15 Banana and Tree Fern.
- 16 Banana in fruit.
- 17 Bananas and Sugar Canes, Canary Islands.
- 18 Sugar Cane Cutting, Canary Islands.
- 19 Orange Trees.
- 20 Orange flowers and fruit.
- 21 Bread Fruit (Artocarpus).
- 22 Jack Fruit.
- 23 Mangosteen (Garcinia).
- 24 Egg Plant (Solanum melongena).
- 25 Vanilla Plant in fruit.
- 26 Olive Trees on Terrace in Tyrol.
- 27 Olive Branch with fruits.

**CACTI.**

In addition to those listed we have about 150 Photographs of living Cacti and other succulents from the Manchester Corporation Collection. List on application.

- |                                           |   |
|-------------------------------------------|---|
| 28 Cereus, Queen of the Night, in flower. | D |
| 29 Cereus marginatus, group (Mexico).     |   |
| 30 Cereus gigantea, group (Mexico).       |   |
| 31 Cereus gigantea, in flower (Mexico).   |   |
| 32 Cereus Macdonaldii, flower, near view. |   |

**WATER PLANTS.**

- |                                          |   |
|------------------------------------------|---|
| 33 Victoria Regia in Tank.               |   |
| 34 Victoria Regia in Marsh.              | D |
| 35 Nymphaea odorata.                     | P |
| 36 Aponogeton distachon, Cape Pond Weed. |   |
| 37 Eichornia speciosa, Water Hyacinth.   |   |
| 38 Nelumbium, Indian Lotus.              | D |

**TREE FERNS, &c.**

- 39 Group of Tree Ferns.

- |                                            |  |
|--------------------------------------------|--|
| 40 Polypodium serpens.                     |  |
| 41 Platycerium alcinorne, Stags Horn Fern. |  |

**VARIOUS.**

- |                                                         |   |
|---------------------------------------------------------|---|
| 42 Dracæna, Ceylon.                                     |   |
| 43 Dracæna, in flower, Scilly.                          |   |
| 44 Dracæna australia.                                   |   |
| 45 Dracæna avenue, Scilly.                              |   |
| 46 Cordylina indivisa, in flower.                       |   |
| 47 Puya chilensis, in flower.                           |   |
| 48 Aralia papyrifera.                                   |   |
| 49 Agave Americana, Scilly.                             |   |
| 50 Agave, Americana, bud.                               |   |
| 51 Agave Americana, flower.                             |   |
| 52 Agave, in flower, Scilly.                            |   |
| 53 Mangrove forest, India.                              | D |
| 54 Mangrove seedlings.                                  | D |
| 55 Mangroves, stilt roots of.                           | D |
| 56 Banyan and baobab.                                   | D |
| 57 Fourcroya, in flower, Scilly.                        |   |
| 58 Fourcroya, in flower, Botanical Gardens, Manchester. |   |
| 59 Fourcroya Flowers, near view.                        |   |
| 60 White Cotton Tree (Eriodendron).                     |   |
| 61 Candle Tree (Parmentiera).                           |   |
| 62 Sword Plant.                                         |   |
| 63 Rubber Tree, Ficus.                                  |   |
| 64 Papyrus, Upper Nile.                                 | D |
| 65 Echinium candicans.                                  |   |
| 66 Ravenalia (Traveller's Tree).                        |   |
| 67 Cycad grove.                                         |   |
| 68 Cycas revoluta, Ovuliferous Leaf.                    |   |
| 69 Zamia integrifolia, Ovulate and Staminate Cones.     |   |
| 70 Aibes and Eucalyptus Trees.                          |   |
| 71 Autumnal tints, Lake Erie.                           | D |
| 72 Corynocarpus, N. Zealand.                            |   |
| 73 Phormium tenax, N.Z. Flax.                           |   |
| 74 Dragon's Blood Tree.                                 |   |
| 75 Bamboo Canes, Ceylon.                                |   |
| 76 Feather Grass, etc.                                  | D |
| 77 Grass Trees, Tasmania.                               |   |
| 78 Senecio hunteri, group.                              |   |
| 79 Senecio hunteri, group.                              |   |
| 80 Drosophyllum, scrub.                                 |   |
| 81 Drosophyllum.                                        |   |
| 82 Drosophyllum and Glaria.                             |   |
| 83 Welwitschia mirabilis.                               |   |
| 84 Raoulia eximia, Vegetable Sheep.                     |   |
| 85 Azorella diapensioides, Vegetable Sheep.             |   |
| 86 Azorella diapensioides, Vegetable Sheep in Section.  |   |

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section  
L.S.—Longitudinal Section.

**Section BB 28—TEA, COFFEE and COCOA INDUSTRY.**

**TEA.**

- 1 Tea Plants in Flower and Seed.
- 2 Tea Estate.
- 3 Tea Estate Factory, India.
- 4 Tea Plantation on Hill-side, Ceylon.
- 5 Tea Nursery.
- 6 Packing Tea—Tamil Coolie.
- 7 Plucking Tea—Gang of Coolies carrying basket.
- 8 Tea Plucker.
- 9 Tea—Coolies sorting the day's plucking.
- 10 Tea—Weighing in the leaf.
- 11 Tea—Leaf Withering Shed.
- 12 Tea—Fermenting Trays.
- 13 Tea—Firing the Tea.

- 14 Tea—Sifting by hand.
- 15 Tea—Sifting by machine.
- 16 Tea—Packing the Tea in chests.

**COFFEE.**

- 17 Coffee Plant, with flowers and fruit.
- 18 Coffee picking.
- 19 Coffee drying.

**COCOA.**

- 20 Cocoa—Plucking the pods.
- 21 Cocoa—Carrying the pods in basket.
- 22 Cocoa—Carrying basket on head.
- 23 Cocoa—Piling pods in heaps.
- 24 Cocoa—Drying house interior.

**Section BB 29—WHEAT and other CEREALS.**

A collection of photographs and photomicrographs.

Plain Slides 1/3 each. Coloured, where suitable, 3/6 each.

- |                                          |   |                                                                 |   |
|------------------------------------------|---|-----------------------------------------------------------------|---|
| 1 Field of ripe wheat.                   | P | 24 Smut (Ustilago), Ears of Wheat, various stages of infection. | P |
| 2 Field of ripe wheat, near view.        | P | 25 Rust Puccinia graminis, Æcidium stage on Berberis leaf.      | P |
| 3 Reaping Wheat-field with sickle.       | P | 26 Wheat Rust, Æcidiospores in section Berberis Leaf.           | M |
| 4 Reapers at work with scythe.           | P | 27 Wheat Rust, Uredospores in section Wheat Leaf.               | M |
| 5 Reaping with Self Binder.              | P | 28 Wheat Rust, Teleutospores in section Wheat Stem.             | M |
| 6 Ears of wheat.                         | P | 29 Ears of barley.                                              | M |
| 7 Grain of wheat.                        | M | 30 Barley spike in sheath, L.S.                                 | M |
| 8 Wheat spike in sheath, T.S.            | M | 31 Barley, L.S. anther.                                         | M |
| 9 Wheat spike in sheath, L.S.            | M | 32 Barley embryo, L.S. showing suspensory cells.                | M |
| 10 Wheat flower, E., x 10.               | M | 33 Barley, L.S. Grain with Embryo.                              | M |
| 11 Wheat stigma, with pollen tube.       | M | 34 Barley, L.S. Embryo (large).                                 | M |
| 12 Wheat, embryo sac, T.S.               | M | 35 Barley, T.S. Embryo.                                         | M |
| 13 Wheat embryo egg and suspensor cells. | M | 36 Barley, T.S. Grain, x 60.                                    | M |
| 14 Wheat, developing embryo, T.S.        | M | 37 Ears of Oats.                                                | P |
| 15 Wheat, T.S. grain, x 60.              | M | 38 Field of Oats injured by Frit Fly.                           | P |
| 16 Wheat, L.S. grain with embryo.        | M | 39 Group of Maize Cobs.                                         | P |
| 17 Wheat, L.S. embryo enlarged.          | M | 40 Maize Grain, L.S. with embryo.                               | P |
| 18 Wheat, L.S. plumule.                  | M | 41 Fruiting heads of 21 varieties of cereals.                   | P |
| 19 Wheat starch.                         | M |                                                                 |   |
| 20 Wheat leaf, T.S.                      | M |                                                                 |   |
| 21 Wheat stem, hollow, T.S.              | M |                                                                 |   |
| 22 Wheat stem, solid, T.S.               | M |                                                                 |   |
| 23 Wheat stem, solid, L.S.               | M |                                                                 |   |

**Section BB 30—STARCHES and CELL CONTENTS.**

A new series of photomicrographs of authentic specimens.

Plain Slides 1/6 each.

- |                                              |  |                                                   |  |
|----------------------------------------------|--|---------------------------------------------------|--|
| 1 Wheat Starch in Situ in grain.             |  | 22 Sago starch. Polarised light.                  |  |
| 2 Wheat Starch, Ordinary light.              |  | 23 Tapioca Starch, Ordinary light.                |  |
| 3 Wheat Starch, Polarised light.             |  | 24 Tapioca Starch, Polarised light.               |  |
| 4 Potato Starch in Situ in tubers.           |  | 25 Kidney Bean Starch, Ordinary light.            |  |
| 5 Potato Starch, Ordinary light.             |  | 26 Pea Starch, Ordinary light.                    |  |
| 6 Potato Starch, Polarised light.            |  | 27 Ginger Starch, Ordinary light.                 |  |
| 7 Barley Starch, Ordinary light.             |  | 28 Ginger Starch, Polarised light.                |  |
| 8 Barley Starch, Polarised light.            |  |                                                   |  |
| 9 Oat Starch, Ordinary light.                |  | 39 Phajus, Leucoplasts in T.S. Tuher, x 30.       |  |
| 10 Oat Starch, Polarised light.              |  | 40 Euphorbia, Dumbbell Starch in L.S. Stem, x 30. |  |
| 11 Rye Starch, Ordinary light.               |  | 41 Pellionia, Starch in Situ, in T.S. Stem, x 30. |  |
| 12 Rye Starch, Polarised light.              |  |                                                   |  |
| 13 Maize Starch, Ordinary light.             |  |                                                   |  |
| 14 Maize Starch, Polarised light.            |  |                                                   |  |
| 15 Rice Starch, Ordinary light.              |  |                                                   |  |
| 16 Rice Starch, Polarised light.             |  |                                                   |  |
| 17 Canna Starch (Tous les Mois), Ordinary.   |  |                                                   |  |
| 18 Canna Starch (Tous les Mois), Polarised.  |  |                                                   |  |
| 19 Arrowroot Starch, Natal, Ordinary light.  |  |                                                   |  |
| 20 Arrowroot Starch, Natal, Polarised light. |  |                                                   |  |
| 21 Sago Starch. Ordinary light.              |  |                                                   |  |

**CELL CONTENTS.**

- 47 Ricinus, Aleurone grains in T.S. Seed.
- 48 Rheum, Sphaero, crystals in root.
- 49 Taraxacum, Inulin crystals in root.
- 50 Ficus elastica, Cystoliths in V.S. leaf.
- 51 Cirsea, Raphides in leaf.
- 52 Allium, Raphides in cuticle of Bulb.

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

**Section BB 31—ALPINE FLORA.**

A series of photographs, in Switzerland, in natural surroundings, taken expressly for lantern slides by J. B. Garnett.

Plain Slides 1/3 each. Coloured, where suitable, 3/- each.

1 Corner of Alpine Meadow in June, Campanulas, Ox Eye Daisies, etc.		19 <i>Phyteuma comosum</i> —Horned Ramplon (Blue) and Veronica.	
2 Corner of Alpine Meadow in June, Rampions, Ox Eye Daisies, Violas, etc.		20 <i>Campanula barbata</i> (White variety).	
3 <i>Anemone sulphurea</i> .		21 <i>Rhododendron ferrugineum</i> —"Alpine Rose."	
4 <i>Thlaspi rotundifolium</i> —Alpine pennycress.		22 <i>Rhododendron ferrugineum</i> on Morraime Mer de Glace.	
5 <i>Viola alpina</i> .		23 <i>Pyrola secunda</i> —Wintergreen.	
6 <i>Polygala chamaebuxus</i> —Box-leaved Milkwort.		24 <i>Gentiana acaulis</i> .	
7 <i>Dianthus carthusianum</i> .		25 <i>Gentiana verna</i> .	
8 <i>Silene nutans</i> —Catchfly.		26 <i>Echium vulgare</i> —Viper's Bugloss.	
9 <i>Silene acaulis</i> —Moss Campion.		27 <i>Calamintha Alpina</i> .	
10 <i>Genista sagittata</i> .		28 <i>Primula acaulis</i> .	
11 <i>Trifolium alpinum</i> —Alpine Trefoil.		29 <i>Soldanella alpina</i> .	
12 <i>Achemilla montana</i> —Lady's Mantle.		30 <i>Soldanella</i> , peeping through snow.	
13 <i>Aronia rotundifolia</i> .		31 <i>Malanthemum bifolia</i> .	
14 <i>Sempervivum montanum</i> .		32 <i>Anthericum liliastrum</i> (St. Bruno's Lily).	
15 <i>Saxifraga aspera</i> .		33 <i>Veratrum album</i> .	
16 <i>Saxifraga rotundifolia</i> .		34 <i>Edelweiss</i> .	
17 <i>Saxifraga alazon</i> .		35 Alpine <i>Rhododendrons</i> and Mountain Pines.	D
18 <i>Phyteuma spicatum</i> —White Ramplon.		36 Alpine Flowers in the Tyrol.	D

**Section BB 32—INSECTIVOROUS PLANTS.**

Plain Slides 1/3 each. Coloured, where suitable, 3/- each.

1 <i>Drosera rotundifolia</i> .	D	23 <i>Sarracenia purpurea</i> .	P
2 <i>Drosera rotundifolia</i> , single plant.	3/- P	24 <i>Sarracenia flammula</i> , in flower.	P
3 <i>Drosera rotundifolia</i> , group.	P	25 <i>Sarracenia toffiana</i> , in flower.	P
4 <i>Drosera</i> , leaf, with captured insect.	M	26 <i>Sarracenia</i> , pitchers of various species.	P
5 <i>Drosera</i> leaves.	D	27 <i>Sarracenia</i> , pitcher open, to show flies.	P
6 <i>Drosera</i> , T.S. leaf (glandular hairs).	M	28 <i>Nepenthes destillatoria</i> .	D
7 <i>Drosera dichotoma</i> .	P	29 <i>Nepenthes pitchers</i> .	D
8 <i>Drosera capensis</i> .	P	30 <i>Nepenthes</i> , young, Australia.	D
9 <i>Drosera</i> and <i>Pinguicula</i> .	D	31 <i>Nepenthes Curtisii splendida</i> , Pitcher.	P
10 <i>Pinguicula vulgaris</i> .	P	32 Pitcher of <i>Nepenthes</i> , Digestive glands, surface view.	M
11 <i>Pinguicula lusitanica</i> .	P	33 Pitcher of <i>Nepenthes</i> , Digestive glands, Trans. section.	M
12 <i>Pinguicula</i> V.S., entire leaf, x 6.	M	34 <i>Nepenthes</i> group (Hueckel).	D
13 <i>Pinguicula</i> V.S. leaf, with stalked and sessile glands, x 500.	M	35 <i>Dionea muscipula</i> (Venus fly trap).	P
14 <i>Pinguicula cordata</i> .	P	36 <i>Dionea muscipula</i> (Venus fly trap).	D
15 <i>Lathraea</i> and <i>Pinguicula</i> capturing apparatus.	D	37 <i>Dionea</i> and <i>Aldrovanda</i> leaves.	D
16 <i>Lathraea squamaria</i> .	P	38 <i>Aldrovanda vesiculosa</i> .	D
17 <i>Lathraea squamaria</i> .	D	39 <i>Darlingtonia californica</i> , in flower.	P
18 <i>Lathraea squamaria</i> , L.S. scale-glands.	M	40 <i>Drosophyllum lusitanicum</i> .	D
19 <i>Utricularia</i> , living plant.	P	41 Spinous structure, in pitfalls.	D
20 <i>Utricularia</i> , bladders enlarged.	P	42 <i>Bowea volubilis</i> , in flower.	P
21 <i>Utricularia</i> developing bladders in Section.	M	43 Group of insectivorous plants.	D
22 <i>Utricularia</i> , in flower.	P	44 <i>Siphium</i> , L.S. node.	M

**Section BB 33—PARASITES and EPIPHYTES.**

(See also Section BB 4.—Fungi.)

Plain Slides 1/3 each. Coloured, where suitable, 3/- each.

No. 1 to 21 are British.

**PARASITES.**

1 Dodder on Furze.	P	8 <i>Lathraea squamaria</i> on root of Elm (out of the ground).	P
2 Dodder on Furze, enlarged.	P	9 <i>Lathraea squamaria</i> , rootlet penetrating root of host (Sycamore), T. Section.	M
3 Dodder on Clover.	M	10 Bird's Nest Orchid, <i>Neottia</i> .	P
4 <i>Mistletoe</i> on Apple.	P	11 <i>Endotropic Microhiza</i> in root of <i>Neottia</i> .	M
5 <i>Mistletoe</i> on Apple cut to show fusion.	P	12 <i>Lousewort</i> , <i>Pedicularis</i> .	P
6 <i>Lathraea squamaria</i> , <i>Toothwort</i> .	P	13 <i>Yellow Rattle</i> , <i>Rhinanthus</i> .	D
7 <i>Lathraea squamaria</i> , with sucker on roots of Poplar.	D	14 <i>Broomrape</i> , <i>Orananche</i> on grass roots.	P

Slides Toned to an Artistic Brown Shade cost 6d. each, or 4/8 per dozen extra.



**Section BB 33—Parasites and Epiphytes—Continued.**

15 Bastard Toad Flax, Root suckers.	D	24 Tillandsia sp., Epiphyte.	D
16 Seedlings of Dodder, Broomrape and Cow Wheat.	D	25 West Indian Orchids, group.	D
17 Birch Tree killed by Polyporus.	D	26 Epiphytes on tree trunk, Madagascar.	D
18 Hyphae of Parasitic Fungi.	D	<b>VARIOUS—Chiefly Foreign.</b>	
19 Lichen in section, showing Alga and Fungus in Symbiosis.	M	27 Parasitic Balanophore.	D
<b>EPIPHYTES.</b>		28 Brugmansia on Cissus root	D
20 Ivy on Tree.	P	29 Sarcophyte sanguinea.	D
21 Tree killed by Ivy.	P	30 Lophophyllum mirabile.	D
22 Epiphytic Orchids in Forest (Kerner).	D	31 Rafflesia Padma.	D
23 Epiphytes in Jungle, India.	P	32 Rhopalocnemis and Heloels.	D
		33 Parasites on Hydrophytes.	D

**Section BB 34—HORTICULTURE AND AGRICULTURE.**

A new Series which will be added to from time to time.

Plain Slides 1/3 each. Coloured, where suitable, 2/6 each.

1 Trenching.	D	9 Pear Tree correctly pruned.	P
2 Bastard Trenching.	D	10 Pear Tree incorrectly pruned.	P
3 Formation of Compost.	D	11 Plum Tree correctly pruned.	P
4 Plough, old form, Jersey.	P	12 Plum Tree incorrectly pruned.	P
5 Field of Oats carefully weeded and flourishing.	P	13 Black Currant, correctly pruned.	P
6 Field of Oats choked with Charlock.	P	14 Black Currant incorrectly pruned.	P
<b>PRUNING OF FRUIT TREES.</b>		15 Red and White Currants, correctly pruned.	P
7 Apple Tree correctly pruned.	P	16 Red and White Currants, incorrectly pruned.	P
8 Apple Tree incorrectly pruned.	P	17 Gooseberry correctly pruned.	P
		18 Gooseberry incorrectly pruned.	P

**Section BB 35—BOTANICAL ILLUSTRATIONS.**

Comprising the greater part of the illustrations included in the "Text Book of Botany," by Prof. James Small, D.Sc., and reproduced as Lantern Slides by his permission. 554 Slides. We also supply the book, price 21/-.

Plain Slides only, 1/3 each.

Not less than 100 selected from this section £5 15s. 0d. per hundred.

The complete collection of 554 Slides £30. In six drawer Pine Cabinet £31 17s. 6d.

Slide			Slide		
No. Fig. No.	Title.		No. Fig. No.	Title.	
1	1	Dandelion, Life History.	25	69/63	Various forms of Starch.
2	2/3	Structure of Bean and Maize Seeds.	26	64	Chloroplasts in Pellionia.
3	4	Black Pepper Seed, T. and L.S.	27	65	Resting Nucleus of a Cell.
4	5	Cardamom Seed, E. and L.S.	28	66	Nuclear Division, Mitosis-Stages.
5	6	Fruit and Seed Castor Oil.	29	67	Reduction Division of Nucleus.
6	7/9	Seeds of Pea, Oat, etc.	30	68/69	Apical Cells of Alga and Equisetum.
7	10/12	Seeds of Watercress, Larkspur, Chickweed.	31	70/71	Apices of Stem of Root.
8	13/16	Various types of Embryos.	32	72/75	Forms of Simple Cells.
9	17/19	Arillate Seeds.	33	76/78	Forms of Cells.
10	20/23	Various types of Embryos.	34	79/84	Cells and Vessels with contents.
11	24/26	Various types of Embryos.	35	85	Nymphaea Petiole, T.S.
12	27/30	Sections of Various Seeds.	36	86	Idioplasts in Nymphaea.
13	31	Bean Germination.	37		Collenchyma, etc., for Strength (Table, p. 42).
14	32/35	Various Germinating Embryos.	38	87	Distributions of Tissues in Stems.
15	36	Various Seedlings.	39	88/90	Sieve Tubes and Bast Fibres.
16	37	Germinating Stages of Date.	40	91/96	Continuity of Protoplasm, Various Types of Fibres.
17	38/39	Germination of Hard Seeds.	41	97/101	Thickening of Cell Walls.
18	40	Plasmodium of a Myxomycete, Stages.	42	102/107	Vessels, Various Types of Thickening.
19	41	Plasmodium of Myxomycete.	43	108	Thickening of Cell Walls.
20	42/43	Typical Cells with contents.	44	109/114	Wood and Bast Fibres.
21	44/45	Cystaliths.	45	115	Annular Vessel of Maize.
22	46	Inulin Crystals in Cells.	46	116/120	Branched Vessels.
23	47/50	Crystals and Raphides.	47	121	Tyloses in Wood.
24	51/58	Starches and Leucoplasts.			

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

## Section BB 35—Small's Botany—Continued.

Slide No. Fig. No.	Title.	Slide No. Fig. No.	Title.
48 122/126	Bulbils, Runners, and Adventitious Roots.	117 303	Root Cortex Hyacinth.
49 127/129	Phylloclades.	119 304/305	Root Iris, T.S.
50 130/131	Shoots of Larch and Pine.	119 306	Diarch Root Hesperis.
51 132/133	Suckers of Mentha.	120 307	Stele of Monocot Root, T.S.
52 134/135	Rhizomes, Iris and Polygonatum.	121 308	Diarch Root Ferns, T.S.
53 136/137	Rhizomes, Bistort and Scabium.	122 309	Transition from Stem to Root in T.S.
54 138	Ranunculus, Entire Plant.	123 310	Course of Transpiration Current.
55 139	Creeping Stem of Carex.	124 311/313	Root Hairs, Vascular Bundles.
56 140/141	Various Tuhera.	126 314/315	Osmotic Experiment.
57 142/143	Corns of Crocus.	125 316	Buckwheat Effect of Culture Solutions.
58 144/146	Scaly Bulbs of Liliun.	127 317	Osmotic Pressure in Beetroot.
59 147	Onion Bulb.	128 318/319	Apparatus showing Root Pressure.
60 148/149	Structure of Lamium Stem.	129 320	The Potometer (Darwin).
61 150/161	Structure of Helianthus Stem.	130 321	Horizontal Potometer.
62 152	Vascular Bundle, L.S., Helianthus.	131 322	Photosynthesis. Evolution of O. by Elodea.
63 153/154	Cucumber, T. and L.S. Bundle.	132	Table-CO <sub>2</sub> . Absorption.
64 155/156	Structure of Monocot. Stem.	133 323	Method of Obtaining Units of Sunlight.
65 157/159	Structure of Monocot. Stems.	134	Assimilation Table, Helianthus.
66 160/161	Structure of Pinus Stem.	135	Assimilation, Temp. Coefficient curve.
67 162/163	Bordered Pits of Pinus.	136 325	Chlorophyll Absorption Spectra.
68 164/165	Resin Ducts and Glands.	137 326	Exhalation of CO <sub>2</sub> by Seeds.
69 166/167	Rhizome Male Fern, Sections.	138 327	Heat of Respiration Experiment.
70 168	F.V. Bundle from Fern Stem.	139 328	Respiring Quotient Apparatus.
71 169/170	T.S. Rhizome Fern.	140 329a	The Nitrogen Cycle.
72 171/172	Amplexicaul and Sheathing Leaves.	141 329b	Nodules on Leguminous Root.
73 173	Prickles on Rose Branch.	142 330	Section of Pea Root.
74 174/175	Stipules and Tendrils.	143 331	Drosera Leaf.
75 176/177	Forms of Stipules.	144 332	Drosera Glandular Apex Tentacle.
76 178/179	Stipules and Petioles.	145 333	Leaf Dionca.
77 180/184	Compound and Simple Leaves.	146 334/335	Nepenthes and Sarracenia Pitchers.
78 185/187	Various Compound Leaves.	147 336	Utricularia bladders.
79 188/193	Forms of Simple Leaves.	148 337/339	Pitchers of Nepenthes, Sarracenia, and Heliamphora.
80 194/200	Peltate, etc., and other Leaves—Venation.	149 341/342	Bryophyllum and Ornithogalum Buds.
81 201/208	Venations and Margins of Leaves.	150 343	Buds of Horse Chestnut and Lilac.
82 210/215	Margins of Leaves.	151 346/347	Buds of Oak and H. Chestnut.
83 217/227	Various Leaf Forms.	152 348/354	Vernation in Leaf Buds.
84 231/235	Various Leaf Forms.	153 355/361	Vernation in Leaf Buds.
85 236/243	Pinnate and Palmate Leaves.	154 362/368	Dichotomous Branching.
86 244/246	Multifoliate Leaves.	155 364/366	Accessory Buds.
87 247/249	Whorled and other Leaves.	156 369/371	Branching of Stamens.
88 250	Primula Petiole, T.S.	157 374	Twig of Cherry Tree.
89 251/253	Leaf traces in Stem.	158 375/376	Twigs of Lime and Carex.
90 254	Beet Leaf, T.S.	159 377/379	Pine Apple and Pine Cone.
91 255	Rice Leaf, T.S.	160 379	Phyllotaxis divergence.
92 256/259	Forms of Plant Hairs.	161 389	Diagram of Phyllotaxis.
93 260/261	Forms of Leaf Hairs.	162 381	The Phi Spiral.
94 262/266	Stomata and their development.	163 382	Apical Cell, Pteris.
95 265	Development of a Stoma.	164 385	Pulley Auxanometer.
96 266/7	Stomata of Hellebore and Pine.	165 386	Potamogeton Stem, T.S.
97 268	Oleander Leaf, T.S.	166 387	Isotetes Leaf, T.S.
98 269/270	Protection of Stomata.	167 388	Graphs of Day and Night Growth.
99	Numerical Table of Stomata.	168 389	Graph, effect of Light and Temperature.
100 271	Marram Grass.	169 390	Growth in Bean and Bindweed.
101 272/274	Structure of Pine Leaf.	170 392/393	Distribution of Growth.
102 275	Structure of Fern Petioles.	171 394	Ricinus hypocotyl, T.S.
103 276	Adventitious Roots of Bryophyllum.	172 395/396	Old Sunflower Stem, T.S.
104 277/278	Root Caps, L.S. and Entire.	173 397	Three Ages Dicot. Stem.
105 279/280	Root Hairs.	174 398	Lime Stem, T.S.
106 281/283	Forms of Tap Roots.	175 399/400	Aristolochia Stem, T.S.
107 284/286	Fibrous and other Roots.	176 401/402	Growth of Monocot. and Dracena.
108 287/290	Tuberous Roots.	177 403	Bundle Dracena, T.S.
109 291	Mycorrhiza on Roots.	178 404/405	Pine Stem, T.S., 2 years.
110 292	Aerial Roots of Mangrove.		
111 293/294	Roots of Banyan and Ivy.		
112 295	Aerial Roots of Orchid.		
113 296/297	Aerial root Orchid T.S. and Dodder Plant.		
114 298/299	Dodder and Rafflesia.		
115 300/301	Thesium alpinum suckers.		
116 302	Section of Young Roots.		

Storage Cabinets for Slides in all sizes—See Cover.

Section BB 35—Small's Botany—Continued.

Slide No. Fig. No.	Title.	Slide No. Fig. No.	Title.
179 406	Pine Stem, L.S.	234 700/701	Reversed Racemes.
180 407	Section Thickening Root.	235 702/703	Flowers of Water Plants.
181 408	Cortex Young Lime Stem, T.S.	236 704/707	Receptacular Nectaries.
182 409	Lenticel in Quercus.	237 708/713	Petal Nectaries.
183 410	Section of Lenticel.	238 714/717	Stamen, Nectaries; Pollen, Flowers.
184 411/412	Twining Stems.	239 718/720	Flowers with exposed nectar.
185 414/415	Tendrils.	240 721/725	Flowers with concealed nectar.
186 416/418	Tendrils in Leaves.	241 726	Flower of Bindweed.
187 419/420	Tendrils and Aerial Roots.	242 727/730	Stamens and Appendages.
188 427/430	Leucoplasts and Starch Grains.	243 731/736	Flowers of Milkwort.
189 432/433	Thick Walled Cells.	244 737	Irritable Style Arctotis.
190 434	Aleurone Grains.	245 738	Flower of Prickly Pear.
191 439	Crystalloid and Globoid.	246 739/740	Irritable Stamens.
192 440/442	Stages in Floral Development.	247 741	Evolution of Flower Colours.
193 443/444	Flowers of Crassula, Sedum.	248 742	Yucca Flower with Pronuba.
194 445/448	Types of Inflorescence.	249 743	Flower of Coriandrum.
195 449/453	Types of Inflorescence.	250 744/745	Dioecism in Citrullus.
196 454/455	Flowers of W. Lily & Buttercup.	251 746/748	Plantago, Daphne, and Lythrum Flowers.
197 456/460	Flowers of Myrtle & Primrose.	252 749	Pollen Tube, course of.
198 461/470	Representative Floral Diagrams.	253 750	Senecio, Embryo, sac.
199 471/475	Forms of Estivation.	254 751/752	Anatropous Seed, Nymphaea.
200 479/485	Forms of Gynoceum and Placentation.	255 753	Embryo of Brassica, Stages.
204 510/517	Types of Placentation.	256 754	Young Embryo Orobanch.
205 518/519	Butomum and Armeria Placentation.	257 755	Embryo of Alisma, Stages.
206 520	Typical Anatropous Ovule.	258 758	Embryology Pinus.
207 521	Stages in Anatropous Ovule.	259 759/765	Dehiscent Fruits, Follicles.
208 522	Stages of Embryo Sac Senecio.	260 766/769	Silique and Siliqua.
209 523/525	Types of Ovules.	261 770/776	Septicidal and loculicidal dehiscence.
210 529/538	Types of Ovules.	262 777/786	Septifragal dehiscence and capsules.
211 539/541	Forms of Carpels.	263 787/791	Dehiscence by teeth and pores.
212 542/546	Types of Styles.	264 792/796	Indehiscent Fruits.
213 547/554	Types of Stigmas.	265 796/797	Acorn and Filbert.
214 555/559	Types of Stigmas.	266 798/801	Lomentum and Samara.
215 560/564	Androecium and Anthers.	267 802	Cremocarp Anglica.
216 565/671	Types of Pollen Grains.	268 803	Cremocarpus.
217 672	Stamen of Lavatera.	269 804/805	Carcerules.
218 573	Development Pollen Grain.	270 806/807	Regmas.
219 574/579	Types of Stamens.	271 808/810	Berries.
220 580/587	Types of Stamens.	272 811/812	Receptacular Fruits.
221 588/689	Stamens, Anthers, and Appendages.	273 813/816	Drupes.
222 590/602	Stamen Dehiscence, Pores.	274 817/821	Pseudocarps.
223 603/604	Stamens Valvular Dehiscence.	275 822/826	Domestic and Medicinal Fruits.
224 605/613	Types of Androecium.	276 827	V.S. Fruit Pteleogynium.
225 614/619	Types of Androecium.	277 828/829	Seeds of Orchid and Sandwort.
226 620/622	Pollinia.	278 830/831	Bladdery Fruits.
227 623/624	Regular Corolla, Dianthus.	279 832/836	Pappose and Feathery Fruits.
228 625/627	3 Types of Corolla.	280 836	Wind dispersal of Dandelion.
229 628/632	Types of Corollas.	281 837	Dandelion Fruit in motion.
230 633/640	Types of Corollas.	282 838	V.S. Fruit Coconut.
231 641/643	Corolla Appendages.	283 839/840	Fruits of Juniper and Yew.
232 644/646	Types of Calyx.	284 841/843	Fruits resembling insects, etc.
233 647/652	Types of Calyx.	285 844/845	Fruits with woody hooks.
234 653/654	Flowers of Goosefoot and Ash.	286 846	Fruit of Dorstenia.
235 655	Flower of Leucopodium.	287 847/849	Sling Fruits.
236 656	Types of Raceme.	288 850	Plasmolysis in Parenchyma.
237 657/660	Racemes.	289 851/852	Negative and Positive Osmosis.
238 661/664	Types of Catkins.	290 853	Positive and Negative Osmosis.
239 665/668	Strobile, Corymb, Capitulum.	291 854/855	Protoplasmic Streaming.
240 670/672	Panicles of Grasses.	292 856/857	Geotropism.
241 673/675	Panicle, Spadix, and Spike.	293 858	Germination of Cucurbita.
242 676	Compound Corymb of Pirus.	294 859	Diagram of Relaxation Time.
243 677/680	Terminal Flowers and Cymes.	295 860	Perceptive Region Root Apex.
244 681/682	Cymose Inflorescence.	296 861	Hydriion Differentiation in Root.
245 683	Cymose Inflorescence.	297 862	Hydriion Differentiation in Stem.
246 684	Ranunculus bulbosus, scorpioid cyme.	298 863	Orientation of Secondary Root.
247 685/686	Boragoid cyme.	299 864	Reversed Geotropism.
248 687	Comfrey, Boragoid cyme.	300 865	Geotropic Curvatures in Root.
249 688/689	Cyme Drepanium and Rhipidium.	301 866	Geotropic and Heliotropic Curvature.
250 690/691	Cymose Umbels.	302 869	Pulvinus of Sensitive Plant.
251 692/693	Cymose Heads Scabiosa & Plane.	303 870/871	Sensitive Stigmas and Stamens.
252 694/697	Cyathium Verticillaster.	304 872/873	Lapsana and Achillea Flowers.
253 698	Mixed panicles Privet and Vine.		

Opaque Lantern Screens, all sizes—See Catalogue F.

Section BB 35—Small's Botany—Continued.

Slide		Slide	
No. Fig. No.	Title.	No. Fig. No.	Title.
325	874/875	396	1007
326	876	397	1008/1010
327	877	398	1011
328	878	399	1012
329	879	400	1013
330	880	431	1014
331	881	402	1015
		433	1016/1017
332	882	494	1018/1022
		405	1023/1024
333	883/884	436	1025/1027
		407	1028/1029
334	894	408	1030/1032
335	897	409	1033/1034
336	899	410	
337	900	411	1036
338	901	412	1037
339		413	
340	902	414	1039
341	903	415	1040
342	904	416	1041/1042
343	905	417	1043/1044
344	906	418	1045
345	907/908	419	1046/1047
346	909/910	420	1048/1050
347	911/912	421	1051/1052
348	913	422	1053/1054
349	914/915	423	1055/1056
350	916/918	424	1057
351	919/921	425	1058
352	922/923	426	1059/1064
353	924/925	427	1069/1070
354	926	428	1071/1073
355	927/929	429	1074/1075
		430	1076/1080
356	930/931	431	1081/1082
357	932/936	432	1083/1084
358	937/939	433	1085/1086
359	940/942		
360	943/945	434	1087/1089
		435	1090/1092
361	946	416	1094
362	947/948	437	1098
363	949	438	1099
364	950	439	1100
365	951	440	1101/1102
366	952/954	411	
367	956	442	1105/1106
368	957	443	1109/1111
369	958/959	444	1112/1113
370	960	445	1114/1116
371	961	446	1117/1118
372	962	447	1119/1120
373	963/964	448	1221/1223
374	965	449	1124
375	966/967	450	1125
376	968	451	1126
377	969/972	452	1130/1134
378	973/974	453	1136/1137
379	975/976	454	1138
380	977/980	455	1139/1143
381	981/982	456	1144
382	983	457	1145
383	984/985	458	1146/1147
384	986	459	1148/1151
385	987/988	460	1152
386	989/990	461	1153
387	991/992	462	1154
389	993	463	1155
389	994/995	464	1156/1157
390	996	465	1158/1159
391	997/998	466	1160
392	999	467	1161/1162
393	1000/1002	468	1163/1168
394	1003/1004	469	1169/1170
395	1005/1006	470	1171/1179

Lecture Lanterns in various patterns—See Catalogue F.

Section BB 35—Small's Botany—Continued.

Slide No.	Fig. No.	Title.	Slide No.	Fig. No.	Title.
471	1180	Aquilegia, Flower.	505	1263/1269	Myosotis and Comfrey, Flowers.
472	1181/1188	Cruciferae, Flowers and Fruit.	506	1276	Lavender, Flowers.
473	1189/1191	Papaveraceae, Flowers and Fruit.	507	1277/1280	Solanaceae, Flowers and Fruit.
474	1192/1194	Corydalla & Hypericum, Flowers.	508	1281	Atropa Belladonna Plant.
475	1195/1196	Strawberry and Cherry, Flowers.	509	1282	Hyocymus Niger, Flowering Plant.
476	1197/1198	Strawberry and Rose, Flowers.	510	1283/1284	Scrophulariaceae, Flowers.
477	1199/1200	Rose, Flower and Section.	511	1285/1287	Valerian, Flowers and Fruit.
478	1201/1207	Rosaceae, Flowers and Fruit.	512	1289/1290	Scabiosa, Flowers and Fruit.
479	1208	Avena, Flower and Fruit.	513	1291/1293	Campanula, Flower and Fruit.
480	1209/1213	Leguminosae, Flowers and Fruit.	514	1294	Siphocampylus, Flowers.
481	1214/1215	Leguminosae, Floral Diagrams.	515	1295	Campanulaceae, Flowers.
482	1216/1218	Saxifraga, Leaves and Flowers.	516	1296/1298	Compositae, Flowers.
483	1219	Parnassia, Staminate.	517	1299	Style Forms in Compositae.
484	1220/1222	Geranium, Floral Structure.	518	1300	Stamen Forms in Compositae.
485	1224	Monsonia, Floral Diagram.	519	1301/1304	Compositae, Various Stamens.
486	1225	Oxalis, Flower.	520	1305	Compositae, Floral Diagrams.
487	1226/1228	Rutaceae, Flowers and Fruit.	521	1306	Compositae, Fruits.
488	1229/1236	Euphorbia, Flowers and Fruit.	522	1307/1311	Gramineae, Flowers and Fruit.
489	1237/1238	Mercurialis, Flowers and Fruit.	523	1312/1314	Carex, Flowers and Stem.
490	1239	Buxus, Flowers.	524	1315/1317	Cyperaceae, Flowers and Fruit.
491	1240	Limnanthes, Flowers and Fruit.	525	1318/1322	Arum, Life History.
492	1241	Impatiens, Flowers and Fruit.	526	1323/1328	Liliaceae, Flowers and Fruit.
493	1242	Malva, Flowers and Fruit.	527	1329/1332	Colchicum, Flowers and Fruit.
494	1244/1247	Malva, Flowers and Fruit.	528	1333	Smitax, Leaves and Fruit.
495	1248/1250	Malvaceae, Flowers.	529	1334	Aloe, Leaf, T.S.
496	1251/1252	Viola, Flower.	530	1335/1339	Amaryllidaceae, Flowers & Fruit.
497	1253/1266	Umbelliferae, Flowers and Fruit.	531	1340	Iris, Flower.
498	1257	Carrot, Umbel.	532	1341/1343	Crocus, Flower.
499	1259	Umbelliferae, Leaves.	533	1344/1346	Orchidaceae, Flower.
500	1260/1261	Erica, Flowers and Fruit.	534	1347	Orchidaceae, Flowers & Pollinia.
501	1262/1264	Pimpernel & Primrose, Flowers.	535	1348/1349	Orchidaceae, Flowers.
502	1265	Centaur, Dichastal Cyme.	536	1350	Vanilla, Fruit, T.S.
503	1266	Gentian, Flower and Fruit.			
504	1267	Chlora, Flower.			

# MICROSCOPICAL PREPARATIONS

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SEE CATALOGUE "A."



GE 3-96—Glacial Scouring, Barmouth.

## GEOLOGICAL SLIDES.

### Section GE 1—GEOLOGICAL MAPS, DIAGRAMS, SECTIONS, &c.

Plain Slides 1/3 each. Coloured, as priced in margin.

- |                                                                  |           |                                                     |
|------------------------------------------------------------------|-----------|-----------------------------------------------------|
| 1 Geological map, British Isles.                                 | 4/6       | 9 Coal fault, near Dudley, section.                 |
| 2 Various strata and their animal and plant contents.            | 4/0       | 10 Coal fault, near Newcastle-on-Tyne.              |
| 3 Ideal Section of the crust of the earth: a series of 8 slides. | Col. 10/- | 11 Strike fault, section.                           |
| 3a Primary Rocks and Remains.                                    | Col. 3/6  | 12 Rocks as originally developed in water.          |
| 3b Secondary and Tertiary Rocks and Remains.                     | Col. 3/6  | 13 Rocks dislocated and rearranged.                 |
| 3c Active Volcanoes.                                             | Col. 3/6  | 14 Ridge formed by earth's cooling.                 |
|                                                                  |           | 15 Section showing veins, pockets, and beds of ore. |
|                                                                  |           | 16 Formation of waterfall, section.                 |

### Section GE 2—AGRICULTURAL GEOLOGY.

The slides in this section are reproduced by permission from diagrams in "Agricultural Geology," by J. E. Marr, Esq., F.R.S. (Methuen & Co.). The slide numbers correspond with the figure numbers in book. They form a useful series of clear diagrams for teaching purposes. Full list on application.

Plain Slides only 1/- each.

*These Slides cannot be hired.*

### Section GE 3—GEOLOGICAL PHOTOGRAPHS.

Views of scenery showing features of Geological interest. The entire collection has been rearranged and many new photographs have been added.

(See also Sections GE 4, GE 5, GE 6, and GE 12.)

Plain Slides 1/3 each. Coloured, where suitable, 3/- each.

#### SCOTLAND.

- |                                                        |                                                        |
|--------------------------------------------------------|--------------------------------------------------------|
| 1 Markland shore nr. Brodick; weathering of Sandstone. | 2 Markland shore nr. Brodick; weathering of Sandstone. |
|                                                        | 3 Markland, Dyke looking seaward.                      |
|                                                        | 4 Markland, another dyke, nearer Corrie.               |

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

Section GE 3—Geological Photographs—Continued.

- 5 Corrie, Pillow masses of Dyke.  
 6 Corrie, roadside boulder.  
 7 Glen Cloy, fault in Sandstone Cnoc Dubh.  
 8 A "Soft Dyke" between Brodick and Corriegills.  
 9 Intermediate Red Sandstone in Conglomerate between Brodick and Corriegills.  
 10 Corriegills, Pischstone Exposure on shore.  
 11 Corriegills Boulder.  
 12 Corriegills Boulder, another view.  
 13 Conglomerate Shore, Corriegills.  
 14 Glen Dhub, stream cut through bottom of old lake with Peat and Glacial Debris.  
 15 Glen Dhub, looking down stream the way out through Glacial Debris.  
 16 Glen Cloy, Dyke forming a Sill in stream.  
 17 Beinn a Chliabhain summit, with saddle and Cir Mhor.  
 18 Cir Mhor, Caisteal Abhail from B. Chliabhain.  
 19 Part of Goatfell fr. B. Chliabhain.  
 20 Part of Goatfell with Glen Rosa fr. B. Chliabhain.  
 21 Across Glen Shurig, mountains of coarse and fine grained granite.  
 22 Fallen Rocks, North Arran.  
 23 Drummadoon, the Fort.  
 24 King's Caves, Drummadoon.  
 25 King's Caves, Drummadoon, view from entrance.  
 26 Bannan Head, South Arran, end of headland from shore.  
 27 Bannan Head, South Arran, columnar structure.  
 28 Dykes nr. Bannan Head; Ailsa Craig in distance.  
 29 Dykes, near view.  
 30 Several dykes running out to sea.  
 31 Dyke nr. Kildonan (Fine Clouds).  
 32 Dyke nr. Kildonan; Piadna Is. in distance.

**Orkneys.**

- 38 Hole of Rowe, Orkneys.  
 39 Near Inganess Geo, Orkneys.  
 40 Black Cragg, Orkneys.  
 41 Lyre Geo, Orkneys.  
 42 North Gaulton Castle, Orkneys.  
 43 Ramna Geo, Orkneys.

**Other Views in Scotland.**

- 47 Strollamus, Skye, Water Cascade in White Marble.  
 48 Strollamus, Skye, Igneous Dyke, diverting stream.  
 49 Kilchrist, Skye, Igneous wall-like Dyke.  
 50 Kilchrist, Skye, Grikes worn by rain in White Marble.  
 51 Ashig, Skye, Roche Moutonnée, Red Hills in distance.  
 52 Coast of Skye, Kyleakin and Broadford, Flat raised Beach.  
 53 Lismore, Raised Beach, with ancient sea cliffs now 100 yards inland.  
 54 Lismore, Raised Beach, with ancient sea cliffs now 100 yards inland.  
 55 Novar, Ross-shire, the Black Rock, Gorge in O.R. Sandstone.  
 56 Fingal's Cave, Staffa.  
 57 Arthur's Seat and Lion's Haunch from St. Leonards.  
 58 Arthur's Seat, nearer view.  
 59 Columnar Basalt, Lion's Haunch Vent, Samson's Ribs, Arthur's Seat.  
 60 Intrusive Sheet of Teschenite, Salisbury Craigs, Arthur's Seat.

**IRELAND.**

- 67 Giant's Causeway, general view  
 68 Giant's Causeway, another view

**ISLE-OF-MAN.**

- 79 Atlas Cave, Isle of Man (S.E.).  
 80 Sugar Loaf Rock, Port St. Mary, I.O.M.  
 81 Sugar Loaf Rock, Port St. Mary, I.O.M.

**LANCASHIRE.**

- 87 Sand Dunes, Birkdale, from sea.  
 88 Sand Dunes, Birkdale, inland.

**WALES.**

- 94 Coast erosion, stratified rocks, Barmouth.  
 95 Coast erosion, near view, Barmouth.  
 96 Glacial scoring, Barmouth.  
 97 Glacial scoring, Barmouth.  
 98 Glacial scoring, Barmouth.  
 99 Stone with glacial scratches, Barmouth.  
 100 Lays on Slate Rocks, Aran Beuilyn.  
 101 Slate Quarries, Festiniog.  
 102 Snowdon.  
 103 Bettwys-y-Coed, Swallow Falls.  
 104 Sand dunes, Prestatyn.

**DERBYSHIRE.**

- 115 Kinder, from Nab Brow, Derbyshire.  
 116 Edale Valley, Derbyshire.  
 117 Mam Tor, Castleton.  
 118 Winnatts, Castleton, Derbyshire.  
 119 Winnatts, Castleton, Derbyshire.  
 120 Raised Beach, Castleton.  
 121 Shale over limestone, Windy Knoll, Castleton.  
 122 Shale outcrop, Windy Knoll, Castleton.  
 123 Shale outcrop, Windy Knoll, Castleton.  
 124 Bitumen over limestone, Windy Knoll, Castleton.  
 125 Cavedale, Castleton.  
 126 Peveril Castle, Castleton.  
 127 Peak Cavern approach, Castleton.  
 128 Peak Cavern arches, Castleton.  
 129 Peak Cavern, Victoria Cave, Castleton.  
 130 Peak Cavern floor (Blue John), Castleton.  
 131 Blue John Mine, fairy grotto, Castleton.  
 132 Blue John Mine, crystal waterfall, Castleton.  
 133 Blue John Mine, dining room, Castleton.  
 134 Blue John Mine, limy secretions from wall, Castleton.  
 135 Blue John Mine (stalactites), Castleton.  
 136 Blue John Mine (stalactites), Castleton.  
 137 Blue John Mine (stalagmite), Castleton.  
 137a Stalagmite, Derbyshire.  
 138 Speedwell Mine, first descent, bottomless pit, Castleton.  
 139 Speedwell Mine, canal opening, Castleton.  
 140 Tissington, synclinal and anticlinal folding.  
 141 Tissington, synclinal and anticlinal folding another view.  
 142 Tissington, limestone spires.  
 143 Small Dale Quarry, Peak Forest.  
 144 Dove Holes, Hill of Lime Ash.  
 145 Matlock, The High Tor.  
 146 Matlock, variation of strata in quarry.  
 147 Alport, variation of strata in quarry.  
 148 Topley Pike, near Buxton.

**YORKSHIRE** (see also Section GE 6).

- 159 Great Douk Cave entrance, Ingleboro' Chapel-le-Dale.  
 160 Pot Hole, Ingleboro', Chapel-le-Dale  
 161 Twisted Limestone strata, Bolton Abbey.

**NORTH STAFFORDSHIRE.**

- 172 Trentham, False-bedded Keuper Basement.  
 173 Trentham, Fault and False-bedded Sands, Lr. Keuper.  
 174 Trentham, False-bedded Trias Sandstone.

Slides Toned to an Artistic Brown Shade cost 6d. each, or 4/6 per dozen extra.

Section GE 3—Geological Photographs—Continued.

**SOUTH STAFFORDSHIRE Coalfield District.**

- 180 Section Coal Measures, Netherton Hills, nr. Dudley.  
 181 Section S. Staffs. Coalfield, east of Stour-bridge.  
 182 Primitive Mining Gear in Black Country Gln Pit, 15yds deep—"Heathen" Coal and Gubbin Ironstone.  
 183 Coal Measure Clays, nr. Oldbury, Worcs.  
 184 Coal Measure Clays, nr. Oldbury, Worcs.  
 185 Coal Measure Clays, Doulton's Working, nr. Netherton.  
 186 Rowley Hills—Samson's Quarry, S. Staffs. Coalfield.  
 187 Rowley Hills—Columnal Structure (Dolerite).  
 188 Rowley Hills—Boss of Weathered Basal (Dolerite).  
 189 Rowley Hills—Spheroidal Weathering of Basalt.  
 190 Rowley Hills—Hailstone Quarry—old and new faces.  
 191 Wren's Nest Hill—Dudley—Upper Silurian—Chasm where inner band of Limestone has been removed from E. side, dip 70°.  
 192 Glacial Sands and Gravels—Nr. West Bromwich.  
 193 Permian Sandstone—Ripple-marked Slab—Hamstead, nr. Birmingham.  
 194 Permian Sandstone and Interbedded Marl—Hamstead, nr. Birmingham.  
 195 Permian Sandstone—Hamstead, nr. Birmingham.  
 196 Carboniferous Sandstone—Nr. Halesowen, S. Staffs. Coalfield.  
 197 Middle Bunter Sandstone—Gt. Barr. Staffs.  
 198 Lower Bunter Sandstone, False Bedding—Kinver, nr. Stourbridge.  
 199 Cave Dwelling (not pre-historic) inhabited until 1887—Lr. Bunter S. Stone—Kinver.

**LEICESTERSHIRE.**

- 205 Spheroidal Gypsum bands in Upper Keuper Red Marl—Leicester.  
 206 Horizontally-bedded Trias, with Sherry bands overlying Vertical Slates—Enderby.

**SOMERSET.**

- 212 Cheddar Cliffs.  
 212a Cheddar Cliffs.  
 213 Stalactites and stalagmites (in cave).  
 214 Stalactites and stalagmites (in cave).  
 215 Stalactites and stalagmites (in cave).

**DORSET.**

- 219 Contorted strata, Lulworth, Weymouth.

**KENT.**

- 223 Fall of Cliff, St. Margaret's Bay, Dover.  
 224 Fall of Cliff, St. Margaret's Bay, Dover.

**DEVONSHIRE.**

**Ilfracombe.**

- 235 Capston Hill.  
 236 Watermouth Cave, Hangman Point.  
 237 Disjointed Beds, Weathered and Cleaved.  
 238 Rockham, Fine illustration of cleavage and crags structure.  
 239 Rockham, Tabular Peaks.  
 240 Rockham, Cleaved slates and creeks worn in hard and soft beds.  
 241 Rockham, Coast and rocks, good illustrations of outcrop.  
 242 Morthoe, Broken joints in hard beds or Devonian.  
 243 Morthoe, Lee Point, Wave Scene.  
 244 Morthoe, West, showing vertical hard bed—Devonian.  
 245 Morthoe, Big Splash.  
 246 Morthoe, Big Splash.

- 247 Morthoe, General view of coast line to Bull Point.  
 248 Bull Point, Rock with storm clouds.  
 249 Bull Point, Rounded shore hills.  
 250 Bull Point, Rocks Headlands with cleaved slates.  
 251 Woolacombe, Bay Slate Shelves on shore.  
 252 Hillsboro Point, one of many bays and creeks off the Devon coast.  
 253 Lynton, W. Lyn, Step water falls showing weathering of jointed planes.  
 254 Lynton, W. Lyn Bridge, Denudation planes in Devonian worn like shelves.  
 255 Lynton, W. Lyn, Weathering of joints in fracture lines.  
 256 Lynton, W. Lyn Waterfall, Action on jointed Devonian beds.  
 257 Torquay, Cliff and outlier off Hopis Nose.  
 258 Torquay, Cliff and outlier off Hopis Nose, enlarged view.

**CORNWALL.**

- 264 Penzance, Mount's Bay, Submerged Forest.  
 265 Penzance, Mount's Bay, Submerged Forest, roots of large trees.  
 266 Penzance, Typical boulder weathering in hard jointed rock.  
 267 Penzance, Marine eroded jointed rocks giving boulded appearance.  
 268 Penzance, Face of Destroyed Promenade.  
 269 Land's End, Headlands of folded hard beds.  
 270 Land's End, Tabular and Crag type hard beds.  
 271 Land's End, Tabular Castle rocks hard beds.  
 272 Land's End, Pavement structure in shore beds.  
 273 Land's End, Castellate structure in hard bedded Devonian with creek in softer beds.  
 274 Land's End, Character Cave and headland features in alternating Devonian Shale and Slate.  
 275 Land's End, Cave in Softer Devonian beds.  
 276 Land's End, Stages in denudation, Pillar rocks being worn down.  
 277 Land's End, Weather worn rocks.  
 278 Land's End, Serpentine Rock.  
 279 Bedruthan Devonian outliers, Crag type.  
 280 Bedruthan, Marine erosion in soft and hard beds.  
 281 Bedruthan, Cave in alternating hard and soft slate and shale.  
 282 Bedruthan, Rough seas and highly inclined alternating shales and slates giving rough crag surface.  
 283 Bedruthan, Battle of sea and land. Effect of waves on indurated shale and slat  
 284 Bedruthan, High seas and effect of surf and spray on indurated surfaces.  
 285 Bedruthan, Small pointed rock surfaces and rough sea contours.  
 286 Bedruthan, Characteristic cone-shaped outlier.  
 287 Boscastle, Waves breaking over rocks, 2 views.  
 288 Boscastle, Waves breaking over rocks, near view.  
 289 Boscastle, Creek in fissure jointed Devonian hard beds showing step surface.  
 290 Boscastle, Thin bedded rocks in Devonian and small jointed surface denudation.  
 291 Boscastle, Wave action under-pinning headland.  
 292 Newquay Coast, stage in erosion Devonian hard beds.  
 293 Newquay, Table rocks and buttress protection  
 294 Newquay, Sea and land battle spray and surf advancing over denuded pavements.

All Slides may be had **Plain**—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section.

L.S.—Longitudinal Section.



Section GE 3—Geological Photographs—Continued.

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SCILLY ISLANDS.

- 330 Piper's Hole, Tresco, Scilly.
- 331 Columnar disintegration, granite, Scilly.
- 332 Disintegration of granite, Scilly.
- 333 Disintegration of granite, Scilly.
- 334 Weathered rocks, Peninnis Head, Scilly.
- 335 Perched rock, Scilly.
- 336 Perched rock, Scilly.
- 337 Undercut rocks, Scilly.
- 338 Undercut rocks, Scilly.
- 339 Rocking stone, Scilly.
- 340 Logan Rocks, Scilly.
- 341 Hanjague Rocks, Scilly.
- 342 Boulders at cavern entrance, Scilly.

Section GE 4—FIELD GEOLOGY

These Slides are reproduced, by special permission, from the original photographs, drawings, and tables in the "Field Note Book of Geological Illustrations," by Miss Hilda D. Sharpe, formerly Science Mistress, Edgbaston High School for Girls. [Flatters and Garnett, Ltd., Publishers; 3/6 net.]

This book will be found of great service to Lecturers and Students. Plain Slides 1/3 each. Coloured, where suitable, 3/- each, unless otherwise marked.

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| <p>0 Geological Map of British Isles, Coloured only. 4/6</p> <p>1 British Isles, Physical Map.</p> <p>2 Classification of Rock-forming Minerals.</p> <p>3 Classification of Stratified or Aqueous Rocks.</p> <p>4 Regular bedding in Permian Sandstone, Torbay.</p> <p>5 False bedding in Triassic (Bunter) Sandstone east Kilver.</p> <p>6 Submerged Forest at Llanaber, near Barmouth.</p> <p>7 Submerged Forest at Llanaber, Tree Stumps.</p> <p>8 Inclined Strata at Dudley.</p> <p>9 Anticline and Syncline.</p> <p>10 Unconformable Strata S. of Portishead.</p> <p>11 Normal Faults near Torbay.</p> <p>12 Over-folded Fault at Lickey.</p> <p>13 Over-folded Fault, Diagram.</p> <p>14 Classification of Unstratified or Igneous Rocks.</p> <p>15 Typical Exposures of Igneous Rocks in Quarry.</p> <p>16 Intrusive sheet of Igneous Rock.</p> <p>17 Columnar structure and Weathering.</p> <p>18 Volcanic "neck," Arthur's Seat, Edinburgh.</p> <p>19 Classification of Metamorphic Rocks.</p> <p>20 Quartzite at Lickey.</p> <p>21 A Slate Quarry.</p> <p>22 Schists in the Highlands.</p> <p>23 Hand-specimen of Schist.</p> <p>24 Weathered Rock Surface, Granite.</p> | <p>25 Weathered Rock Surface, Harlech Grit.</p> <p>26 Weathered Rock Surface, Pickering Tor.</p> <p>27 Scree, Carey-Saeth, Cwmbychan.</p> <p>28 Rugged outline, Snowdon range.</p> <p>29 Smooth outline, Radnor Forest.</p> <p>30 Sand-dunes formed by action of wind.</p> <p>31 Interior, Limestone Cave.</p> <p>32 Interior Cave, showing Stalactites.</p> <p>33 Sketch Map of basin of River Arto and its tributaries.</p> <p>34 Source of River Arto.</p> <p>35 River Arto entering Cwmbychan Lake.</p> <p>36 River Arto leaving Cwmbychan Lake.</p> <p>37 Nantool Valley above gorge, Peat Pog.</p> <p>38 River Nantool, Gorge.</p> <p>39 Waterfall in stream.</p> <p>40 Meeting of the Rivers.</p> <p>41 River Arto, lower course.</p> <p>42 River Arto, bend near mouth.</p> <p>43 River Arto, the mouth.</p> <p>44 Torrential river, Hønefos, Norway.</p> <p>45 Young stream cutting V-shaped valley.</p> <p>46 Pot Holes in R. Gelt, Cumberland.</p> <p>47 River-winding in Teme Valley.</p> <p>48 Estuary in Rivern Severn, with Bore.</p> <p>49 Norwegian Fjord.</p> <p>50 Plan of Roseg Glacier.</p> <p>51 Roseg Glacier, with Snowfield and Moraines.</p> <p>52 Roseg Valley, with Glacial River.</p> <p>53 Roseg Valley, Boulders and Scree.</p> <p>54 Glacial Crevasses.</p> |
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Storage Cabinets for Slides in all sizes—See Cover.

Section GE 4—Field Geology—Continued.



G.E. 4—81 Natural Arch in Devonian Limestone—Torquay.

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| <p>55 Morteratsch Glacier.<br/>56 Norwegian Glacier, termination in lake.<br/>57 Lake in glaciated rock basin.<br/>58 Erratic and Rocbes Moutonnés.<br/>59 Large Erratic.<br/>60 Ice-worn Gneiss, Sutherland.<br/>61 Boulder Clay.<br/>62 Striated Boulder.<br/>63 Glacial scoring at Barmouth.<br/>64 Action of waves on Stratified Rocks.<br/>65 Action of waves on Unstratified Rocks.<br/>66 Beach formation.<br/>67 Coast protection by Sandbills.<br/>68 Marine denudation at Pendine.<br/>69 General Tables of Stratified Systems.<br/>70 Torridonian Sandstone of N.W. Highlands.<br/>71 Pre-Cambrian Rocks (Longmyndian).<br/>72 Malvern Hills, Igneous Rocks.<br/>73 Folded Quartzites, Inverness.</p> | <p>74 Harlech Grit in Rhinog County.<br/>75 Curved Tremadoc Beds, near Criccieth.<br/>76 Eskdale with Scawfell.<br/>77 Sychnant Pass.<br/>78 Mool-y-Golfa, from Welshpool Road.<br/>79 Wenlock Limestone and Shale, Malvern.<br/>80 Old Red Sandstone, Areley.<br/>81 Devonian Limestone, Torquay.<br/>82 Limestone Gorge, Cbeddar.<br/>83 Dovedale, Lion-faced Rock.<br/>84 Typical Black Country scene, Dudley.<br/>85 Folded Coal Measures, Saundersfoot.<br/>86 Permian Sandstone, Torbay.<br/>87 Sandstone Plain of Severn Valley.<br/>88 Lias at Whitby.<br/>89 Oolite at Leckhampton.<br/>90 Inferior Oolite, Limestone Quarry, Broad way.<br/>91 Chalk Downs, Chiltern Hills.</p> |
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**Section GE 5—THE GEOLOGY OF MOUNTAIN LIMESTONE.**

A fine series of Slides, principally in the Ingleborough district, mostly taken by Messrs. W. Munn Rankin, M.Sc., etc., Principal, Burnley Technical College, and F. G. Hudson.

Plain Slides 1/3 each. Coloured, where suitable, 3/- each.

Typed Lecture Notes, by Mr. Rankin, 1/-

**RELATIONS TO EARLIER ROCKS.**

- |                                                                                                                        |                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <p>1 Unconformity above Silurian Strata, Arrow Wood.<br/>2 Unconformity above Ingletonian Strata, Playfair's Cave.</p> | <p>3 Unconformity above Ingletonian Strata, Thornton Force.<br/>4 Basement Conglomerate on E. Rawthey, Sedbergh.</p> |
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All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section  
L.S.—Longitudinal Section.

Section GE 5—The Geology of Mountain Limestone—Continued.

- 5 Basement Conglomerate on R. Lune, Kirkby Lonsdale.
- 6 False Bedding, Skirwith Quarry.

GENERAL SCAR SCENERY.

- 7 Kilsney Crag.
- 8 Whitbarrow Crag.
- 9 Ingleboro' from Chapel-le-Dale.
- 10 Ingleboro' from Moughton Fell.
- 11 Penyghent.

WEATHERING.

- 12 Weathering along joints, Ribbleshead.
- 13 Weathering, superficial, Whitbarrow.
- 14 Scree, Whitbarrow.
- 15 Scree, Chapel-le-Dale.
- 16 Pavements, Farleton Knott.
- 17 Pavements with Ferns, Whitbarrow.
- 18 Flakes with Junipers, etc., Whitbarrow.
- 19 Anticline and Syncline, Draughton.
- 20 Contortion, Hambleton (1).
- 21 Contortion, Hambleton (2).
- 22 Inclined strata, Skiheden.

STREAM AND RIVER ACTION.

- 23 Waterfall and Pool, River Dee, Yorks.
- 24 Pot-holes, River Dee, Yorks.
- 25 Narrow Gorge, Gordale Beck.

- 26 Gorge, Gordale, distant view (1).
- 27 Gorge, Gordale, near view (2).
- 28 Gorge, Gordale, Waterfall from below (3).
- 29 Gorge, Gordale, Waterfall from above (4).
- 30 Water Sinks, River Aire.
- 31 Water Issues, Malham Cove.
- 32 Water Issues, Anstwick Beck.
- 33 Water Issues, God's Bridge.
- 34 Dry River Course, Easegill (1).
- 35 Dry River Course, Cavern from above, Easegill (1).
- 36 Dry River Course, Cavern from below, Easegill (3).
- 37 Dry Valley, Malham (1).
- 38 Dry Valley with waterfall, Malham (2).
- 39 Dry Valley, Trowgill (1).
- 40 Dry Valley, Trowgill (2).
- 41 Precipice, Malham Cove.
- 42 Natural Bridge, Browgill.

CAVES.

- 43 Swallow Hole, Gaping Gill.
- 44 Clapham Cave, entrance.
- 45 Underground River, Crow Gill.
- 46 Gingle Pot.
- 47 Swallow Hole, Alum Pot.
- 48 Underground drainage, Footnaws Hole.

Section GE 6—BRITISH PHOTOGRAPHS OF GEOLOGICAL INTEREST.

From negatives by GODFREY BINGLEY, Esq., Leeds. A series selected from his very extensive collection. The photographs have been taken expressly to show Geological features, and are of a very high standard of excellence.

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NORTHUMBERLAND.

- 1 Housey Crag, Langfeld, nr. Wooler, Stack of Andesite resting on Porphyrite.
- 2 The Cheviots, from Langfeld.

DURHAM.

- 11 Trow Rocks, nr. South Shields—Cellular Breccia on Lr. Mag. Lime, with major
- 12 Cellular Breccia—S.E. of Frenchman's Bay, S. Shields.
- 13 Trow Rocks, nr. S. Shields. Mylonised Rock lying along thrust plane—Brecciated beds above—Lr. Limestone beneath.
- 14 Frenchman's Bay, S. Shields. Thrust plane, disturbed Beds. Mylonised Rock, Lr. Beds, regularly bedded.
- 15 Marsden Bay (N. end). Velvet Beds. Top of Brecciated beds lying along major thrust plane.
- 16 Marsden Bay—Fissure in Cliffs filled with Breccia fallen in from beds above.
- 17 Marsden Bay (nr. Grotto). Minute Brecciation folding, etc., in Flex. Mag. Lime.
- 18 Marsden Bay Folding, Buckling, Brecciation, etc., against Horst (to left of photo.) Mag. Lime.
- 19 Cliffs, Marsden Bay. Cleavage structure in Upper Mag. Lime—Twisting of Cleavage.
- 20 Marsden Bay (S. of Grotto). Cleavage passing into Brecciated Rock—Mag. Lime.
- 21 Marsden Bay—Brecciated Beds. Upper Mag. Lime.

- 22 Marsden Bay, looking N. Stack in foreground Breccia—Large Isolated Rock—Marsden Rock.
- 23 Marsden Rocks (Chimney Rock on R.) Mag. Lime. Breccia.
- 24 Marsden Rock—Mag. Lime.
- 25 Marsden Rock—Cavern Mag. Lime.
- 26 Marsden Bay ("Lot's Wife" on R.) Middle Mag. Lime.
- 27 Arch between Soster Point and Lizard Point. Mag. Lime.
- 28 Roker, nr. Sunderland. Holy Rock. Upper Yellow Mag. Lime.
- 29 Roker—"Cannon Ball." Concretionary Mag. Lime, under upper Limestone.
- 30 Roker—"Cannon Ball" Limestone—Upper Concretionary Mag. Lime.
- 31 Hendon, nr. Sunderland—Concretionary Upper Mag. Lime. "Cannon Ball" and Botryoidal structures.
- 32 Cliffs—Hendon—"Honeycomb" Concretionary Mag. Lime. Lines of bedding passing through concretions.
- 33 Cliffs—Hendon—Concretionary Mag. Lime—
- 34 Cliffs—Hendon—Thrust of Middle Permian over Upper Concretionary Beds—Note fracturing of Middle Permian.
- 35 Marslack, nr. Ryhope. Shattering of M. L. Beds beneath minor thrust plane—Breccia resting on disturbed Rocks.
- 36 Quarry, nr. Claxhough, minutely faulted Middle Mag. Lime. Cellular Breccia and Breccia.

Carrying Boxes, with Rubber Packing and Leather Handles—See Cover.

Section GE 6—British Photographs of Geological Interest—Continued.

- 37 Fulwell Quarry, nr. Sunderland. Botryoidal Concretionary Mag. Lime.
- 38 Fulwell Quarry. Botryoidal Concretionary Mag. Lime. Large nodule, 1 1/2 in. diameter.
- 39 Fulwell Quarry. Honeycomb Concretionary Mag. Lime.
- 40 Fulwell Quarry. Honeycomb Concretionary Mag. Lime.
- 41 Fulwell Quarry. Cannon Ball and Concretionary Mag. Lime.
- 42 Fulwell Quarry. Rods and Bands in Cellular Conc. Mag. Lime.
- 43 Fulwell Quarry. Concretionary Mag. Lime.
- 44 Fulwell Quarry. Concretionary Mag. Lime.

YORKSHIRE COAST.

- 51 Spurn Point.
- 52 Cliffs N. of Kilnsea Beacon.
- 53 Cliffs, nr. Easington—Slipped masses of cliff.
- 54 Cliffs, Dinnington: 1, Hesse Clay, top of cliff to right; 2, Purple Clay, with Sandy beds of same age; 3, Laminated beds in hollows of basement clay; 4, Basement clay at lower Part of Cliff, also crushed and dragged-out chalk.
- 55 Cliffs, Out Newton, lower part Purple Clay with boulders—capped with later glacial gravels.
- 56 Flamborough Head, from beach at Sewerby—Chalk.
- 57 Flamborough Head—Selwick—Chalk.
- 58 Flamborough Head—Arch Rock—Chalk.
- 59 Flamborough Head—Thornwick Bay—Chalk.
- 60 Flamborough Head—N. of Thornwick—Chalk capped with Boulder Clay.
- 61 Carr Naze—Filey. Weather Cliffs—Boulder Clay
- 62 From Filey Brigg, looking N. Coralline Oolite and Calcareous grits—capped with B. Clay.
- 63 Filey—"The Doodles," Oolite and Calc. Grits—under B. Clay.
- 64 Red Cliff. Cayton Bay. Lr. Calc. grit, Oxford Clay and Kellaway Rock.
- 65 Osgodby Nab. Cayton Bay. Lr. Oolite, Estuarine and Millepore Beds.
- 66 Osgodby Nab, from Carnellian Bay.
- 67 Cliffs between Carnellian Bay and Scarborough—White Nab.
- 68 Cliffs S. of Holbeck Gardens. Scarborough' Upper Estuarine Series
- 69 Castle Hill, Scarborough. N. Side, Middle Oolites and Ball Beds.
- 70 Castle Hill, Scarborough. N. Side, Middle Oolites and Ball Beds.
- 71 Scalby Bay, nr. Scarborough—Base of Cliff, Sand and Pockets of Gravel.
- 72 Cloughton Wyke.
- 73 Iron Scar, nr. Hayburn Wyke, Ripple-marked Estuarine Sandstone and Eller Beck beds.
- 74 Iron Scar—Eller Beck beds—Lr. Estuarine.
- 75 Cliffs, Blea Wyke Point—Estuarine—Dogger and Blea Wyke Beds.
- 76 Blea Wyke—Nerinea in Dogger.
- 77 The Peak. Dogger and Blea Wyke Beds.
- 78 The Peak. Dogger Boulder with bands of Pebbles and Shells weathered out.
- 79 Cliffs—Robin Hood's Bay—Lr. Lias.
- 80 Robin Hood's Bay. Block of Middle Lias with *Dentalium giganteum*.
- 81 Robin Hood's Bay. Fossil Pectens in slab. Middle Lias.
- 82 Cliffs—Hawsker Bottom. Estuarine, Dogger and Upper Lias.
- 83 Hawsker Bottom—Marine Pot Hole.
- 84 Hawsker Bottom—Upper Lias Breccia.
- 85 Cliffs, Saltwick—Upper Lias and Dogger.

- 86 Saltwick Nab (nr. Whitby). Upper Lias and Dogger capped with Boulder Clay.
- 87 Kettlethness—Old Alum workings—Upper Lias.
- 88 Saltburn. Huntcliff and Shore at low water. "Mushroom Rocks" on Lr. Lias Shales.
- 89 Saltburn—Shore under Huntcliff. "Mushroom Rocks"—Undercut Middle Lias blocks.

YORKSHIRE.

- 101 Section Warmsworth Quarry, nr. Doncaster. Lower Mag. Lime.
- 102 Weathered block of Mag. Limestone Conishorrough.
- 103 The Needles Eye—Newton Dale. Weathered escarpment.
- 104 Stalndale, near Pickering. "Bridestones" on sky line to left.
- 105 "The Bridestones," nr. Pickering—Weathered Calcareous Grit.
- 106 "The Bridestones," nr. Pickering—Weathered Calcareous Grit.
- 107 Brimham Rocks—Nidderdale—Millstone Grit.
- 108 Brimham Rocks—Nidderdale—Millstone Grit.
- 109 Brimham Rocks—Nidderdale—Millstone Grit.
- 110 Brimham Rocks—Nidderdale—Millstone Grit.
- 111 Brimham Rocks—Nidderdale—The Pivot Rock. Millstone Grit.
- 112 Brimham Rocks—Nidderdale—The Dancing Bear. Millstone Grit.
- 113 Stigmara in Ganister Quarry, Meanwood Valley, Leeds. 29ft. from surface of ground on an 8in. Bed of Coal.
- 114 Section of Ganister with Fossil Fern—Meanwood Valley.
- 115 Ingleton. Coal Measure Sections, R. Bank of River Greta.
- 116 Ingleton—Meals Bank Qy. Carb. Lime Coal Seam and Seat earth at X.
- 117 Kingsdale, nr. Ingleton, fr. nr. Routen Pot. Whernside on R. Carb. L.
- 118 Kingsdale, nr. Ingleton. Routen Pot—Ingleborough in dist. Carb. L.
- 119 Warrendale Knotts, Attermire Settle. Carb. Lime.
- 120 Perched Erratic Boulder. Norber, nr. Clapham. Silurian Grit on Carb. Lime.
- 121 Perched Erratic Boulder, Norber, nr. Clapham. Silurian Grit on Carb. Lime.
- 122 Draughton, nr. Skipton—Folding in Carb. Lime.
- 123 Section Arco Wood Quarry, Ribblesdale Carb. Lime resting unconformably on Ludlow Slates.
- 124 Hull Pot, Ribblesdale—"Pot Hole" in Carb. Lime.
- 125 Hunt Pot (Upper part). "Pot Hole" in Carb. Lime.
- 126 Hunt Pot, Ribblesdale. "Pot Hole" in Carb. Lime.
- 127 Hunt Pot, looking opposite direction to No. 126.
- 128 Troller's Gill—Gorge in Carb. Lime.
- 129 Stream above Troller's Gill, forming Delta.
- 130 Nidderdale, nr. Limley. "Goydon Pot" on bank of R. Nidd. Carb. Lime.
- 131 Entrance to "Goydon Pot," on bank of R. Nidd.
- 132 Nidd Head, below Lofthouse. Issue of water from Manchester and Goydon Pots.
- 133 Angram, Upper Nidderdale—Section in Yoredale Shales and Limestone. S. side of Cutting for Bradford W. W. embankment.
- 134 Cogill Beck, nr. Askrigg—Joining of Yoredale Limestone in bed of stream.

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

Section GE 6—British Photographs of Geological Interest—Continued.

- 135 Cogill Beck. Pitting of Yoredale Limestone by action of stream.
- 136 Buttertub Pass, between Wensleydale and Swaledale. A "Buttertub," Carb. Lime.
- 137 Buttertub Pass, between Wensleydale and Swaledale. A "Buttertub," Carb. Lime.
- 138 High Force, Teesdale. Intrusive Sill in Carb. Lime.
- 139 Above High Force, Teesdale. Whinsill and altered Sandstone.
- 140 Whinsill on Basement beds of Carb. Lime. Falcon Cliffs. Upper Teesdale.
- 141 Sect. Skiddaw Slate—Widdy Bank, nr. Pencil Works, Up. Teesdale.
- 142 Mica Trap Dyke. Widdy Bank, Upper Teesdale.
- 143 Saccharoid Limestone, Tblistle Green, Cronkley Fell, U. Teesdale.
- 144 Cauldron Snout, Upper Teesdale—Whinsill.
- 145 Barton Quarry, N.E. of Richmond. Under-set Limestone, Yoredale Series.
- 146 Barton Quarry, N.E. of Richmond. Boulder Clay resting on Under-set. Limestone—Shap Granite and Whin Sill Boulders in foreground.
- 147 Barton Quarry. Glacial striae on upper surface of under-set Limestone—Yoredale Series.
- 148 Barton Quarry. Crinoidal under-set Limestone.
- 149 Barton Quarry. Under-set Limestone with Flint Nodules and Encrinurites—Boulder Clay in Joints—Yoredale Series.
- 150 Forcett Quarry, nr. Richmond. Up. surface of Main Limestone, Yoredale Series.
- 151 Forcett Quarry—Section of "Pot Hole" filled with Boulder Clay in Main Limestone—Yoredale Series.
- 152 Penny Farm Gill, nr. Sedburgh. Carb. Lime. turned into vertical position near Dent Fault.
- 153 River Clough, Garsdale, nr. Sedburgh. Basement beds of Carboniferous Congl.
- 154 Hebblethwaite Gill, nr. Sedburgh—Basement Beds of Carb. Congl. cut out by Stream.
- 155 Roseberry Topping.
- 156 Section Roseberry Topping, 2ft seam of Ironstone and thin seams of same.
- 157 Ayton—Cleveland Dyke—Section in Quarry.
- 158 Marske, nr. Saltburn Quarry, in Lr. Estuarine Sandstone with plant beds.
- 159 Marske, nr. Saltburn. Blocks fr. Quarry, with fossil plants.
- 160 Moors N. of Danby. Ewe Crag Beck, glacial overflow valley (down stream).
- 161 Fyling Dale Moors—Brownrigg—Glacial river channel.
- 162 Rishworth Moor—Blackstone Edge—4ft. of Peat resting on decomposed Millstone Grit.

LINCOLNSHIRE.

- 171 Louth. Chalk Pit—Grimsby Road—Lr. Chalk—Pink hands at base.
- 172 Welton Dale Gravel Pit, Elkington. Current bedded Chalky gravel passing up into decalcified gravel without bedding; covered by few feet of Boulder Clay with rocks of Cheviot type.
- 173 Claxby. Ironstone top of Spilsby Sandstone. *Pecten cinctus* band.
- 174 Section G.N.R. Withcall Tunnel. W. end. N. side. Lr. Chalk, Red Chalk Carstone.
- 175 Market Rasen. Lr. Kimeridge Clay, covd. by blown sand.
- 176 Section Ry. Cutting nr. Donnington-on-Bain. Spilsby Sandstone—Abrupt changes to loose sand.
- 177 River Bain from Rv., Donnington.

NORFOLK.

- 178 Forncett, nr. Norwich (on New Branch Line). Chalky Boulder Clay and Kimeridge Clay with fossils.
- 179 Thorpe Cutting, Norwich—Chalky B. Clay with entangled gravels resting on chalk.
- 180 Watling's Pit, Sprowston, Norwich—Sand and glaciated gravel on Brick Earth.
- 181 Mousehold Heath gravel Pit, Norwich—"Cannon Shot" gravel.
- 182 Thorp Crag Pit, Norwich. Chalk and Norwich Crag.
- 183 Woodlands Lane Qy., Norwich. Lr. Glacial Sand covered with B. Clay.
- 184 Cliffs, Beeston, nr. Cromer. Chalk erratic and marl of W., Norfolk (in 1865 the erratic measured 200ft. long x 60ft. high).
- 185 Cliffs, nr. Bacton Gap, Norfolk. Contorted Till.
- 186 Cliffs between Paston and Mundesley. Contorted Till at crook of stick is one of a series of eyes of sandy gravel containing marine shells—Small fault to rt. of stick—throw abt. 12in.
- 187 Cliffs—Ostend, nr. Bacton. Lr. and Upper Till and Contorted Beds.
- 188 Cliffs—Happisburgh. Lr. and Upper Till, with intermediate Laminated Beds.

SUFFOLK.

- 195 Cliffs between Lowestoft and Kessingland. Current bedding in Middle Glac. Sands, resting on Chillesford Clay.
- 196 Cliffs, nr. Kessingland, Lowestoft. Chalky Boulder Clay and middle glacial sands.
- 197 Lowestoft. "A Groyne," showing how it retards the drift of the pebbles and sand.

DERBYSHIRE.

- 201 Grange Mill, nr. Cromford. Spheroidal Weathering in Volcanic Vent.
- 202 Tideswell Dale. Corals in Carb. Lime.
- 203 Tideswell Dale. Fault in Carb. Lime.
- 204 Dove Dale (up) from Dove Holes. Carb. Lime.
- 205 Dove Holes, Dove Dale, Carb. Lime.
- 206 The "Watch Box." Dove Dale (Down). Weathered Carb. Lime.
- 207 Ravenscar, Miller's Dale, Carb Lime, under Horizontal joint at base of Tor is the Lr. Toadstone.
- 208 The Black Rocks, nr. Cromford—Millstone grit, showing effects of weathering.
- 209 The Black Rocks, nr. Cromford—Millstone grit, showing effects of weathering.

SHROPSHIRE.

- 215 Selattyn—Corals in Carb. Lime. *Lithostrotion irregularis*.

SOMERSET.

- 221 Cheddar Gorge—Carb. Limestone.
- 222 Cheddar Gorge—Carb. Limestone.
- 223 Cheddar Gorge—Carb. Limestone.
- 224 Cheddar Gorge—Carb. Limestone.

LAKE DISTRICT.

- 231 Easedale Tarn, Westmorland.
- 232 Foot of Easedale Tarn. Stream cutting through glacial mountains.
- 233 Easedale—Roches Moutonnées.
- 234 Grange Bridge, Borrowdale. Glaciated Rock.
- 235 Head of Derwentwater. River forming Delta at head of Lake.
- 236 Threlkeld, Section in Granite Quarry.
- 237 Threlkeld, Section in Granite Quarry.
- 238 Eycoott Hill—Hycersthene Dolerite.
- 239 Carrock Fell—Weathered granophyre.
- 240 Screes, Wastwater.

Slides Toned to an Artistic Brown Shade cost 6d. each, or 4/6 per dozen extra.

Section GE 6—British Photographs of Geological Interest—Continued.

LANCASHIRE.

- 250 Clough Foid, Dulesgate, nr. Todmorden. Section showing 12in. seam of coal in "Rough Rock" Millstone Grit.  
 251 Pimlico Quarry (Lancs.), nr. Clitheroe. Escarpment edge of Carb. Lime. in "Reef Knoll."  
 252 Pimlico Quarry, nr. Clitheroe. Slab of Carb. Lime, with heads and stems of Crinoids from "Reef Knoll."

CHESHIRE.

- 260 Storeton Quarry, nr. Birkenhead. Fossil Saurian footprints in Trias sandstone.  
 261 Storeton Quarry, nr. Birkenhead. Fossil Saurian footprints in Trias sandstone.  
 262 Storeton Quarry, nr. Birkenhead. Fossil Saurian footprints in Trias sandstone.  
 263 Storeton Quarry, nr. Birkenhead. Fossil Saurian footprints in Trias sandstone.  
 264 Submerged Forest, Meols.  
 265 Submerged Forest, Meols.  
 266 Hilbre Island. Bunter Sandstone.  
 267 Hilbre Island. Cross bedding in Bunter Sandstone.

NORTH WALES.

- 271 Pistil Rhaiadr—Llanrhadr.  
 272 Volcanic neck—Llangynog.  
 273 Section in Volcanic neck—Llangynog.  
 274 Section in Volcanic neck—Llangynog.  
 275 Cae Deicws Glyn Ceiriog—Curved columns of intrusive Felsite.

ISLE OF MAN.

- 281 The Arches—Langness. Carboniferous basement Conglomerate resting unconformably on Manx Slates.  
 282 The Arches—Langness. Carb. Basement Congl. showing joint planes cutting pebbles.  
 283 St. Michael's Island, Langness. Stratification crossed by cleavage in Manx Slates.  
 284 Scarlet. Undulations in Lr. Carb. Lime. Stack of Scarlet and other volcanic rocks in distance.  
 285 Nr. Scarlet Point—Undulations in Lr. Carb. Lime.

- 286 Stack of Scarlet—Rudely Columnar Basalt; coarse Volcanic Agglomerate and Breccia in foreground.  
 287 Scarlet Point, Carboniferous Volcanic Rocks—Edge of tilted Lava flow—With confused Volc. Breccia and Limestone alongside.  
 288 Cromwell's Walk—Scarlet Point—Jagged edge of jointed Carboniferous Lava.  
 289 Scarlet Point—Carboniferous Volc. Rocks. Lava is tilted vertically, but shows "ropy" flow structure of its originally horizontal surface.  
 290 Scarlet Point—Lava showing "ropy," flow structure on horizontal surface.  
 291 Shore opp. Scarlet Quarry. Lr. Carb. Lime. containing *Campophyllum*.  
 292 Nr. Scarlet Point—Sea-worn gullies along joints in Carboniferous Volcanic Rocks.  
 293 Poyll Vaish, nr. Black Marble Quarry—Doming of Black Carb. Lime. between Volc. Ash and beginning of a fold.  
 294 Foot of Cliff on N. side of Close ny Chollagh Ft., Poyll Vaish. Crumpling of Bik. Carb. Lime. at base of Volc. Ash.  
 295 Close ny Chollagh Point, Poyll Vaish, over-thrust on bedded Carb. Volc. Ash.  
 296 Poyll Vaish—W. side. "Reef Knoll." Carb. Limestone.  
 297 Bay Stacka and "Sugar Loaf" from side of Spanish Head. Flaggy grits in Manx Slates.—the apparently horizontal bedding being probably due to overturned fold.  
 298 Baroo Ned—Spanish Head—Manx slates with veins and dykes.  
 299 Caves between Gob-y-Deigan and Gob-y-Skeddan, hollowed out of crush conglom. in Manx Slates.  
 300 Between Gob-y-Deigan and Gob-y-Skeddau—Manx Slates reduced to crush conglomerate.  
 301 Crags E. side of Sulby Glen. North of Cluggid. Partially disrupted grit bands in Manx Slates—Stages of formation of Crush Congl.  
 302 The Wing. Port Soderick. Folds in Lonan Flags.

Section GE 7—MINERALS, ORES, AND ROCKS.

Photographs of selected specimens, chiefly in the Manchester Museum.

Plain Slides 1/3 each.

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 Celestine crystals.<br/>                 3 Graphite.<br/>                 4 Chalcedony.<br/>                 5 Agate.<br/>                 6 Aragonite crystals, rhombic.<br/>                 7 Zincblende on pseudomorphic quartz.<br/>                 8 Quartz.<br/>                 9 Quartz crystals.<br/>                 10 Quartz, sand embedded.<br/>                 11 Fluorspar crystals with pyrites.<br/>                 12 Fluorspar, isometric.<br/>                 13 Barytes crystals.<br/>                 14 Sulphur crystals, native.<br/>                 15 Pyromorphite crystals.<br/>                 16 Gypsum crystals.<br/>                 17 Lead ore, with crystals.<br/>                 18 Salt crystal, impressions on sandstone.<br/>                 20 Gold ore, California.<br/>                 20a Gold crystals, fernlike.<br/>                 21 Silver, Mexico.<br/>                 22 Copper pyrites.<br/>                 23 Calcite crystals.</p> | <p>24 Calcite crystals on zinclende.<br/>                 25 Calcite crystals, needle spar.<br/>                 26 Diabase, near Pwllheli.<br/>                 27 Gabbro, near Pwllheli.<br/>                 28 Syenite, Malvern.<br/>                 29 Rhyolite, Hungary.<br/>                 30 Volcanic tuff, Andernach.<br/>                 31 Senidine trachyte.<br/>                 32 Dolerite, Staffordshire.<br/>                 33 Granite, Penzance.<br/>                 34 Scoriaceous lava.<br/>                 39 Metamorphic limestone, T.S., x 15. M<br/>                 41 Quartz imbedded in sandstone.<br/>                 42 Shelly agglomerate raised beach, Florida.<br/>                 43 Ammonitic limestone.<br/>                 45 Silurian limestone, slab with fossils.<br/>                 46 Millstone grit, Hayfield.<br/>                 47 Conglomerate, Woolwich.<br/>                 49 Silexensides, polish and grooves.<br/>                 51 Cullinan Diamond, before cutting.</p> |
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All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section  
 L.S.—Longitudinal Section.

**Section GE 8—PETROLOGY.**

A new series of photomicrographs from selected Sections of Typical Rocks.

With the exception of those cases in which it is unnecessary, the same field is shown under both Ordinary and Polarised Light with Crossed Nicols.

The magnification is usually 25 diameters.

Plain Slides only, 1/6 each.

We undertake the preparing of Thin Sections from customers' own rocks, and also the making of photomicrographs from them or from our own stock slides, for Book Illustrations or Lantern Slides, or to illustrate Reports.

O = Ord. Light. C = Crossed Nicols.

1 Biotite-granite, Galloway.	O	49 Norite, Norway.	O
2 Biotite-granite, Galloway.	C	50 Troctolite, Aberdeen.	O
3 Biotite-hornblende-granite, Dalbeattie, Kircudbright.	O	51 Troctolite, Aberdeen	O
4 Biotite-hornblende-granite, Dalbeattie, Kircudbright.	C	52 Hornblende-picrite, Llanerchymedd, Anglesey.	O
5 Tourmaline-granite, Redruth, Cornwall.	O	53 Hornblende-picrite, Llanerchymedd, Anglesey.	C
6 Tourmaline-granite, Redruth, Cornwall.	C	54 Serpentine, red, The Lizard, Cornwall.	O
7 Granite Porphyry vein in Leinster granite, Three Rock, Co. Dublin.	O	55 Olivine Dolerite, Pouk Hill, Walsall.	O
8 Granite Porphyry vein in Leinster granite, Three Rock, Co. Dublin.	C	56 Olivine Dolerite, Pouk Hill, Walsall.	C
9 Quartz Porphyry, Scotland.	O	57 Leucitophyre, Rieden, The Eifel.	O
10 Quartz Porphyry, Scotland.	C	58 Leucitophyre, Rieden, The Eifel.	C
11 Greisen, Grainsgill, Cumberland.	O	59 Porphyritic-olivine-basalt, Lion's Haunch, Arthur's Seat, Edinburgh.	O
12 Greisen, Grainsgill, Cumberland.	C	60 Porphyritic-olivine-basalt, Lion's Haunch, Arthur's Seat, Edinburgh.	C
13 Pitchstone with crystallites, Corriegills, Arran.	O	61 Volcanic agglomerate, Arthur's Seat, Edinburgh.	O
14 Spherulitic pitchstone, Corriegills, Arran.	O	62 Volcanic agglomerate, Arthur's Seat, Edinburgh.	C
15 Rhyolite, Cullin Hills, Skye.	O	63 Palagonite, Tan-y-Craig, Wales.	O
16 Rhyolite, Cullin Hills, Skye.	O	64 Leucite-basanite, Vesuvius eruption, 1868.	O
17 Limburgite, Limburg, Kaiserpal.	C	65 Leucite-basanite, Vesuvius eruption, 1868.	C
18 Limburgite, Limburg, Kaiserpal.	O	66 Hornblende-gneiss, L. Assynt, Sutherland.	O
19 Spherulitic Obsidian, Isle of Lipari.	O	67 Sillimanite-gneiss, Bodenmais, Bavaria.	O
20 Spherulitic Obsidian, Isle of Lipari.	C	68 Sillimanite-gneiss, Bodenmais, Bavaria.	C
21 Perlitic Pitchstone, Chemnitz, Saxony.	O	69 Mica-schist with Garnets, Sutherland.	O
22 Hornblende Syenite, Plauen'scher Grund, Dresden.	O	70 Mica-schist with Garnets, Sutherland.	C
23 Hornblende Syenite, Plauen'scher Grund, Dresden.	C	71 Chialstule Slate, Blencathra, Cumberland, farthest from Granite.	O
24 Nepheline Syenite (Foyaite), Sierre de Monchique, Portugal.	O	72 Quartzite (Schistose), Silesia.	O
25 Nepheline Syenite (Foyaite), Sierre de Monchique, Portugal.	C	73 Quartzite (Schistose), Silesia.	C
26 Nepheline Syenite (Ditrotte), Ditro, Transylvania.	O	74 Quartzite, Bartshill, Nuneaton.	O
27 Nepheline Syenite (Ditrotte), Ditro, Transylvania.	C	75 Quartzite, Kent.	O
28 Mica-lamprophyre (Minette), Auvergne, France.	O	76 Quartzite, Kent.	C
29 Mica-lamprophyre (Minette), Auvergne, France.	C	77 Ganister Sandstone, Lower Coal Measures, Bolton, Lancs.	O
30 Kersantite, Dalbeattie, Kircudbright.	O	78 Ganister Sandstone, Lower Coal Measures, Bolton, Lancs.	C
31 Kersantite, Dalbeattie, Kircudbright.	C	79 Grit, Nailsea, Gloucestershire.	O
32 Trachyte, Drachenfels, Siebengebirge.	O	80 Grit, Nailsea, Gloucestershire.	C
33 Trachyte, Drachenfels, Siebengebirge.	C	81 Torridon Sandstone, Assynt, Sutherland.	O
34 Nepheline-leucite-phonolite, Rocca Monfina, Southern Italy (30 miles N. of Naples).	O	82 Torridon Sandstone, Assynt, Sutherland.	C
35 Nepheline-leucite-phonolite, Rocca Monfina, Southern Italy (30 miles N. of Naples).	C	83 Limestone (calcareous Sandstone) with plant remains, Dunce, Berwick-on-Tweed.	O
36 Diorite, Halsburg, Freiburg, Germany.	O	84 Conglomerate, Coulter, Lanarkshire.	O
37 Diorite, Halsburg, Freiburg, Germany.	C	85 Conglomerate. Coulter, Lanarkshire.	C
38 Hypersthene-andesite, Hungary.	O		
39 Hypersthene-andesite, Hungary.	C		
40 Biotite-andesite, Craigowerhouse, Aughtermuchty, Fife.	O		
41 Biotite-andesite, Craigowerhouse, Aughtermuchty, Fife.	C		
42 Hornblende-andesite, Brungelsburg, Siebengebirge.	O		
43 Hornblende-andesite, Brungelsburg, Siebengebirge.	C		
44 Hornblende-gabbro, The Lizard, Cornwall.	O		
45 Hornblende-gabbro, The Lizard, Cornwall.	C		
46 Olivine-gabbro, Huntly, Aberdeen.	O		
47 Olivine-gabbro, Huntly, Aberdeen.	C		
48 Norite, Norway.	O		

**SECTIONS OF FOSSIL BEARING ROCKS.**

86 Nummulithic Limestone from Gizeh, Egypt.
87 Carb. Limestone with Foraminifera, etc.
88 Limestone with Coral in L.S., Bristol.
89 Limestone with Coral in T.S., Bridlington.
90 Oolitic Limestone, Portland, Dorset.

**OPTICAL PHENOMENA OF CRYSTALS UNDER CONVERGENT POLARISED LIGHT.**

110 Uniaxial interference figure.
111 Uniaxial interference figure. Mica plate introduced.
112 Biaxial interference figure. Oblique position.
113 Biaxial interference figure. Straight position.
114 Pseudo uniaxial interference figure. Oblique position.
115 Pseudo uniaxial interference figure. Straight position.

Carrying Boxes, with Rubber Packing and Leather Handles—See Cover.

**Section GE 9—FOSSIL INVERTEBRATA.**

A series of photographs of typical specimens, principally from the collection in the Manchester Museum.

Plain Slides 1/3 each.

**PROTOZOA.**

(See Section A—1)

**PORIFERA.**

- 1 *Scliscoltho planus*, Chalk.
- 2 *Verrucularia pilcata*, Chalk.
- 3 *Scytalia fastigiata*, Chalk.
- 4 *Siphonia kőnigi*, Chalk.
- 5 *Ventriculites mammillaris*, Chalk.
- 6 *Porosphaera plicolus*, Chalk

**HYDROZOA.**

- 7 *Diplograptus pristis*, Llandello.
- 8 *Didymograptus murchisoni*, Llandello
- 9 *Phyllograptus typus*, Arenig.
- 9a Cast of Jelly-fish.

**ANTHOZOA.**

- 70 *Favosites oculata*, Wenlock Limestone.
- 71 *Acerularia luxurians*, Wenlock Limestone.
- 72 *Omphyma subtrabunata*, Wenlock Limestone.
- 11 *Cyathophyllum truncatum*, Wenlock Limestone.
- 14 *Halysites catenularia*, Wenlock Limestone.
- 15 *Halysites catenularia*, Wenlock Limestone.
- 16 *Strophophora sp.*, Wenlock Limestone.
- 17 *Smithia pengellyi*, Devonian.
- 18 *Favosites cervicornis*, Devonian.
- 19 *Lithostrotion phillipsi*, Carb. Limestone
- 20 *Lithostrotion affine*, Carb. Limestone.
- 21 *Lithostrotion sp.*, T.S., Carb. Limestone. M
- 22 *Lithostrotion sp.*, L.S., Carb. Limestone. M
- 23 *Lithostrotion basaltiforme*, T.S., Carb. Limestone. M
- 24 *Lithostrotion junceum*, L.S., Carb. Limestone. M
- 25 *Cyathophyllum murchisoni*, Carb. Limestone.
- 26 *Cyathophyllum regium*, Carb. Limestone.
- 27 *Syringopora sp.*, Carb. Limestone.
- 28 *Syringopora reticulata*, Carb. Limestone.
- 29 *Zaphrentis rugosa*, Carb. Limestone.

**ECHINODERMA.**

- 30 *Marsupioocrinus cœlatus*, Wenlock Limestone.
- 31 *Marsupioocrinus cœlatus*, Wenlock Limestone.
- 32 *Perelchocrinus articulosus*, Wenlock Limestone.
- 33 *Perelchocrinus moniliformis*, Wenlock Limestone.
- 34 *Aspidosoma trisobolium*, Devonian
- 35 *Dorycrinus mississippiensis*, Keokuk Limestone.
- 36 *Actinocrinus triacondactylus*, Carb. Limestone.
- 37 *Gilbertsoocrinus bursa*, Carb. Limestone
- 38 *Amphoraocrinus gilbertsoni*, Carb. Limestone.
- 39 *Enerinus illiformis*, Muschelkalk.
- 40 *Enerinus illiformis*, Muschelkalk.
- 41 *Ophioderma egertoni*, Lias.
- 42 *Ophioderma milleri*, Lias
- 43 *Pentacrinus briareus*, Lias
- 44 *Hemicidaris intermedia*, Coral Rag
- 45 *Hemicidaris intermedia*, Coral Rag.
- 46 *Astropecten claviformis*, Oolite.
- 47 *Aplocrinus parkinsoni*, Bradford Clay
- 48 *Echinoderms*, from Chalk (group).
- 49 *Marsupites ornatus*, Chalk.
- 50 *Echinocorys vulgaris*, Chalk.

- 51 *Conulus albogalerus*, Chalk.
- 52 *Discoidea cylindrica*, Chalk.
- 53 *Cidaris sceptrifera*, Chalk.
- 54 *Cyphosoma kőnigi*, Chalk.
- 54a *Taxocrinus tuberculata*, Upper Silurian.

**ANNELIDA.**

- 55 Worm tracks and castings, C.M.
- 56 Worm burrows, Millstone Grit.
- 57 Worm tracks, Yoredale Sandstone.
- 58 *Cornulites serpularis*, Wenlock Limestone.
- 59 *Serpulites ornatus*, Wenlock Limestone.
- 60 *Serpulites longissimus*, Upper Ludlow.
- 61 *Calcolaria plexus*, Chalk.

**BRACHIOPODA.**

- 62 *Pentamerus oblongus*, Llandoverly.
- 63 *Whitefieldia tumida*, Wenlock Limestone.
- 64 *Atrypa reticularis*, Wenlock Limestone.
- 65 *Orthis calligramma*, Wenlock Limestone.
- 66 *Strophomena ruglypha*, Wenlock Limestone
- 67 *Strophomena pecten*, Wenlock Limestone.
- 68 *Pentamerus knightii*, Aymestry Limestone.
- 69 *Productus giganteus*, Carb. Lime.
- 70 *Orthis resupinata*, Carb. Lime.
- 71 *Spirifer striatus*, Carb. Lime.
- 72 *Spirifer striatus*, spiral axis, Carb. Lime.
- 73 *Productus horridus*, Magnesian Lime
- 74 *Strophalosia lamellosa*, Magnesian Lime.
- 75 *Spirifer alatus*, Magnesian Lime.
- 76 *Terebratula simplex*, Inf. Oolite.
- 77 *Terebratula fimbria*, Inf. Oolite.
- 78 *Rhynchonella spinosa*, Inf. Oolite.
- 79 *Terebratula maxillata*, Gt. Oolite.
- 80 *Waldbeimia digona*, Gt. Oolite.
- 81 *Rhynchonella obsoleta*, Cornbrash.
- 82 *Terebratula semiglobosa*, Chalk.
- 83 *Rhynchonella plicatilis*, Chalk.
- 83a *Spirifer rotundata*, Carb. Lime.

**POLYZOA.**

- 84 *Ptilodictya lanceolata*, Wenlock Limestone.
- 85 *Fenestella subantiqua*, Wenlock Limestone
- 86 *Fenestella plebeia*, Carb. Limestone.
- 87 *Synocladia vergulacea*, Mag. Limestone.
- 88 *Phyllopora ehrenbergi*, Mag. Limestone.
- 89 *Acanthocladia anceps*, Mag. Limestone.

**MOLLUSCA.**

- 90 *Cardiola interrupta*, Lower Ludlow.
- 91 *Avicula danbyi*, Ludlow.
- 92 *Pelecypoda types*, Carb. Limestone.
- 93 *Pelecypoda types*, Carb. Limestone
- 94 *Aviculopecten papyraceus*, C.M.
- 95 *Anthracoosia acuta*, C.M.
- 96 *Anthracoosia robusta*, C.M.
- 97 *Lima gigantea*, Lias.
- 98 *Pecten aequalivalvis*, Lias.
- 99 *Avicula inaequalivalvis*, Lias.
- 100 *Avicula cygnipes*, Lias.
- 101 *Pecten beaveri*, Chalk.
- 102 *Spondylus spinosus*, Chalk.
- 103 *Lima heperi*, Chalk.
- 104 *Cardita planicosta*, Eocene.
- 105 *Egomphalus rugosus*, Wenlock Limestone.
- 106 *Murchisonia hoydi*, Lower Ludlow.
- 107 *Loxonema sinuata*, Lower Ludlow.
- 108 *Egomphalus catillus*, Carb. Limestone.
- 109 *Natica griffithii*, Carb. Limestone.
- 110 *Gasteropoda types*, Carb. Limestone.
- 111 *Pleurotomaria anglica*, Lias.
- 112 *Amberleya ornata*, Inf. Oolite
- 113 *Pleurotomaria elongata*, Inf. Oolite.

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section  
L.S.—Longitudinal Section.



Section GE 9—Fossil Invertebrata—Continued.

- 114 Pseudomelanella vittata, Cornbrash.  
 115 Cerithium portlandicum, Portland.  
 116 Neurotomaria sp., Chalk.  
 117 Hippochoeres amplius, Eocene.  
 118 Gomphoceras pyriforme, Lower Ludlow.  
 119 Orthoceras flosum, Ludlow.  
 120 Orthoceras sp., Devonian.  
 121 Orthoceras giganteum, Carb. Lime.  
 122 Nautilus sp. (with forams), Carb. Lime.  
 123 Prolecanites sp., Carb. Lime.  
 124 Goniatites crenistria, Carb. Lime.  
 125 Goniatites listeri, C.M.  
 126 Goniatites listeri, C.M.  
 127 Orthoceras obtusum, C.M.  
 128 Ceratites nodosus, Muschelkalk.  
 129 Ammonites bucklandi (section), Lias.  
 130 Ammonites commune, Lias.  
 131 Ammonites planicosta, Lias.  
 132 Ammonites margaritatus, Lias.  
 133 Ammonites bifrons, Lias.  
 134 Belemnites (types), Lias.  
 135 Belemnites, with piragmæone, Lias.  
 136 Nautilus striatus, Lias.  
 137 Nautilus striatus (section), Lias.  
 138 Megatheutis gigantea, Inf. Oolite.  
 139 Ammonites dorsetensis, Inf. Oolite.  
 140 Ammonites bayleanum, Inf. Oolite.  
 141 Nautilus excavatus, Inf. Oolite.  
 142 Ammonites jason, Oxford Clay.  
 143 Ammonites perarmatus, Calc. Grit.  
 144 Ancyloceras armatus, Lower Greensand.  
 145 Ammonites sp.  
 146 Ammonites sp. (section).  
 147 Ammonites, showing distortion.

CRUSTACEA (Trilobites).

- 148 Niobe bomirayi, Cambrian.  
 149 Angelina sedgwicki, Cambrian.  
 150 Olenellus thompsoni, Cambrian.  
 151 Asaphus peltastes, Llandeilo.  
 152 Ogygia buchii, Llandeilo.  
 153 Ampyx pennatus, Caradoc.  
 153a Ampyx mammillatus (Trilolite), Caradoc.  
 154 Asaphus expansus, Wenlock Lime.  
 155 Asaphus sp., Wenlock Lime.  
 156 Phacops caudatus, Wenlock Lime.  
 157 Calymene blumenbachi, Wenlock Lime.  
 158 Trilolite, showing distortion, Carb. Lime.  
 159 Griffithides acanthiceps, Carb. Lime.  
 160 Phillipsia gemmulifera, Carb. Lime.

CRUSTACEA.

- 161 Teallicaris loudonensis, Lower Carb.  
 162 Cyclus johnsoni, C.M.  
 163 Belinurus lunatus, C.M.  
 164 Prestwichia rotundata, C.M.  
 165 Eoscorpilus sparthensis, C.M.  
 166 Enoploclytia imagi, Lower Chalk.  
 166a Podoceras Dulmenensis, Bohemia, Chalk.  
 166b Euphoberia robusta.

INSECTA.

- 167 Stenodictya lobata, C.M.  
 168 Etobliattina sp., C.M.  
 169 Dragon-fly, Solenhofen Limestone.  
 171 Flies in Amber.

Section GE 10—FOSSIL VERTEBRATA.

Principally photographs of typical specimens in the Manchester Museum. Those marked "D" are from drawings.

Plain Slides 1/3 each. Coloured, where suitable, 3/6 each.

PISCES.

- 1 Fishes of the Devonian period.  
 2 Holoptychius nobilissimus (east), O.R. Sandstone. D  
 3 Cephalaspis murchisoni, O.R. Sandstone.  
 4 Osteolepis macrolepidota, O.R. Sandstone.  
 5 Rhizodus hibberti (tooth), Lower Carb.  
 6 Rhizodus hibberti (jaw), Lower Carb.  
 7 Eurynotus crenatus, Lower Carb.  
 8 Goniatodus macrolepis, Lower Carb.  
 9 Cycloptychius carbonarius, C.M.  
 10 Strepsodus sauroides, C.M.  
 11 Sphenacanthus hybodontes, C.M.  
 12 Megalichthys intermedius, C.M.  
 13 Platyosomus gibbosus, C.M.  
 14 Geomichthys sp., C.M.  
 15 Palaeoniscus frieslebeni, Mag. Lime.  
 16 Dapedius punctatus, Lias.  
 17 Lepidotus semiseratus, Lias.  
 18 Lepidotus minor, Lower Cret.  
 19 Beryx sp., Chalk.  
 20 Aptedodus striatus (jaw), Chalk.  
 21 Tomognathus mordax (jaw), Chalk.  
 22 Ptychodus decurrens (teeth), Chalk.  
 23 Ptychodus polygyrus (teeth), Chalk.  
 24 Sharks' teeth, group, Chalk.

AMPHIBIA.

- 25 Loxomma allmanni, skull, C.M.  
 26 Cheirotherium berculis footprint, Trias.  
 27 Cheirotheroid footprints, Trias.  
 28 Cheirotheroid footprints, slab, Trias.

- 29 Labyrinthodont footprints, Trias.  
 30 Labyrinthodont (restoration), Trias. D

REPTILIA.

- 31 Fossil turtle, from slate of Glaris.  
 32 Rhynchosauroid footprints, Trias.  
 33 Mesosaurus tenuidens (remains), Trias.  
 34 Plesiosaurus dolichodeirus, Lias. D  
 35 Plesiosaurus macrocephalus, Lias. D  
 36 Plesiosaurus on slab, Lias. D  
 37 Plesiosaurus bomalospondylus fore paddle, Lias.  
 37a Plesiosaurus grandis, tooth (Reptilia), Kimeridge clay.  
 38 Ichthyosaurus (Whitby), Lias.  
 39 Ichthyosaurus (Whitby), Lias.  
 40 Ichthyosaurus communis and intermedius, Lias. D  
 41 Ichthyosaurus, with coprolite, Lias. D  
 42 Ichthyosaurus platyodon, Lias. D  
 43 Teleosaurus chapmani, Lias. D  
 44 Pelagosaurus sp., Upper Lias. D  
 45 Pterodactylus sp., Solenhofen Limestone.  
 46 Pterodactylus sp., Solenhofen Limestone.  
 47 Pterodactylus crassirostris (restoration landscape). D  
 48 Pterodactylus longirostris. D  
 49 Pleuristernon emarginatum (turtle), dorsal shield, Purbeck Limestone.  
 50 Iguanodon bernissartensis, Lower Cretaceous.  
 50a Iguanodon Restoration, with ideal landscape.  
 51 Mosasaurus (head), Upper Cretaceous. D

Storage Cabinets for Slides in all sizes—See Cover.

Section GE 10—Fossil Vertebrata—Continued.

52 Lariosaurus (cast).	
52a Restoration Oolitic monsters, ideal landscape.	
<b>AVES (BIRDS).</b>	
53 Hesperornis regalis (skeleton), Upper Cretaceous.	D
54 Hesperornis regalis (restoration).	D
58 Archeopteryx lithographica, Solenhofen Slate.	
57 Archeopteryx lithographica (restoration), slate.	D
58 Dodo, head and egg.	
59 Dodo (drawing).	
<b>MAMMALIA, &amp;c.</b>	
60 Palaeotherium, skull, Eocene.	
61 Anoplotherium commune, left ant. foot, Eocene.	
62 Phenacodus primevus, skull (cast), Eocene.	
63 Phenacodus, skeleton, Eocene.	D
64 Hyracotherium ventricolum skull, (cast), Eocene.	
65 Hyracotherium ventricolum, remains, Eocene.	D
66 Pachyderma from Gypsum, skeletons, Oligocene.	D
67 Pachyderma, from Gypsum (restorations), Oligocene.	
68 Hipparion gracile, skull (cast), Lower Pleiocene.	D
69 Mastodon longirostris, left ramus, Lower Jaw, Miocene.	
70 Dinotherium giganteum, Upper and Lower Jaws, Miocene.	D
71 Elephas primigenius, Lower Jaw, with molars, Pleistocene.	
72 Elephas primigenius, cast of molar, Pleistocene.	
73 Mastodon ohioensis, left ramus, Lower Jaw, two molars, Pleistocene.	
74 Mastodon, skeleton, Pleistocene.	D
75 Megatherium, skeleton, pre-historic.	D
75 Irish Elk, skeleton, pre-historic.	D
77 Onchopitidium muriei, skull (cast), pre-historic.	
78 Feet of fossil horses, Eocene to Miocene.	
79 Feet of fossil horses, Miocene to recent.	
80 Feet of fossil horses, the entire series.	
82 Mesohippus intermedius, Skull, Eocene.	
83 Meritherium lyonsi, Skull, Eocene.	
84 Palaeomastodon Wintoni, Skull.	

Section GE 11—FOSSIL BOTANY.

Photographs of specimens, many in the Manchester Museum Collection, and Photomicrographs of thin sections (marked M). Those marked "D" are from Drawings.

Plain Slides 1/3 each. Coloured, where suitable, 2/6 each.

We can supply actual sections of Fossil Plants on 3 1/4 x 3 1/4 glasses for use as Lantern Slides, price from 7/6 each.

**IDEAL LANDSCAPES AND RESTORATIONS.**

1 Silurian Vegetation.	D
2 Devonian Vegetation.	D
3 Ideal Landscape of Coal Measure period.	D
4 Ideal Landscape of Coal Measure period.	D
5 Ideal Landscape of Coal Measure period.	D
7 Carboniferous Vegetation.	D
8 Oolitic Vegetation.	D
9 Mid-Eocene Forest overlooking Lagoon, Bournemouth.	D

**EQUISETALES.**

10 Calamites, Restoration.	D
11 Modern Equisetum. "Forest," 5ft. to 6ft. high.	
12 Calamites varians, medullary Cast.	
13 Calamites cistii, medullary Cast, Lincs. Coal Field.	
14 Calamites ramosus, medullary Cast, Lincs. Coal Field.	
15 Calamites undulatus, medullary Cast.	
16 Calamites branched form, Chilburne.	
17 Modern Equisetum, stem for comparison.	
18 Calamites sp., very young stem, T.S., x 10.	M
19 Calamites sp., young stem, T.S., x 10.	M
20 Calamites sp., old stem, with bark, T.S.	M
21 Calamites sp., large stem, T.S., with base of branch.	M
22 Calamites root (Astromylon), showing base of branch, x 1/2.	M
23 Calamites, Section of cluster of leaves, x 10.	M
24 Calamites and Equisetum Cones.	D
25 Calamostachya Binneyana, Cone, L.S., x 4.	M
26 Calamocladus equisetiformis, impression.	

**SPHENOPHYLLALES.**

27 Sphenophyllum plurifoliatum, T.S., stem, x 10.	M
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**LYCOPODIALES.**

28 Lepidodendron & Calamites, Restoration.	D
29 Lepidodendron with cones, Restoration.	D
30 Lepidophloios acadianus, Restoration.	D
31 Lepidophloios Laricinus, leaf cushions.	
32 Lepidodendron showing dichotomous branching.	
33 Lepidodendron ophiurus, leaf cushions.	
34 Lepidodendron ophiurus, branchlet with leaves attached.	
35 Lepidodendron Harcourtii, stem, T.S., showing Inner and Outer Cortex, x 1/2.	M
36 Lepidodendron Harcourtii, stem, T.S.	M
37 Lepidodendron Harcourtii, T.S., Leaf Bases and Stem Cortex, L.S., x 2.	
38 Lepidodendron Harcourtii, Leaf Bases in L.S.	
39 Lepidodendron sp., origin of branch.	M
40 Lepidodendron Selaginoides, stem, T.S.	M
41 Lepidodendron aculeatum, leaf cushions.	
42 Bothrodendron, Megasporangia, x 80.	M
43 Halonia regularis, stem fragment.	
44 Lepidostrobus, cone of Lepidodendron.	
45 Lepidostrobus, T.S., Sterile Cone of Lepidodendron. Stele well preserved.	M
46 Lepidostrobus, part of cone, T.S., Spores in situ.	M
47 Lepidostrobus, part of cone, T.S., Sporangia and Spores, x 2.	M
48 Lepidodendron and Lycopodium cones.	D
49 Lepidocarpon Lomaxi, Seed in L.S., x 10.	M
60 Lepidocarpon Lomaxi, Seed in L.S. (Model).	

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

Section GE 11—Fossil Botany—Continued.

- 51 *Miadnesia membranacea*, T.S., Seed-like organ, and also Megasporangia of Bothrodendron, x 10. M
- 52 *Sigillaria discophora*, with conc scars. M
- 53 *Sigillaria rugosa*, stem fragment. M
- 54 *Sigillaria reniformis*, stem fragment. M
- 55 *Sigillaria boblayi*, stem fragment. M
- 56 *Sigillaria* (*Favularia* type), stem fragment. M
- 57 *Stigmaria ficoides*, stem fragment. M
- 58 *Stigmaria ficoides*, Root (*Sigillaria*), entire Stump. M
- 59 *Stigmaria ficoides*, Williamson's Stump. M
- 60 *Stigmaria ficoides* with appendages, T.S. M
- 61 *Stigmaria ficoides*, with rootlets, T.S. M
- 62 *Stigmaria ficoides*, Tangential Long Section. M
- 63 *Sigillariastrobus*, cone of *Sigillaria*. M
- FILICALES.**
- 64 *Ankyropteris Westphaliensis*, T.S., rachis, x 8. M
- 65 *Metaclepypdropets duplex*, T.S., rachis, x 5. M
- 66 *Elaepteris Lacattai*, T.S., rachis, x 6. M
- 67 *Stauropteris oldhamia*, T.S., stems, petioles, etc., x 10. M
- 68 *Botryopteris ramosa*, stem, T.S., x 10. M
- 69 *Botryopteris cylindrica*, T.S., x 10. M
- 70 *Botryopteris hirsuta*, T.S., x 10. M
- 71 *Pecopteris dentata*, pinnae. M
- 72 *Dactylothea plumosa*, pinnae. M
- 73 *Asterotheca Miltoni*, part of frond. M
- PTERIDOSPERMÆ.**
- 74 *Heterangium Grievii*, stem, T.S. x 10. M
- 75 *Sphenopteris trifoliata*, part of frond. M
- 76 *Sphenopteris pachyrachis*, part of frond. M
- 77 *Lygenopteris oldhamia*, young unthickened stem, T.S., x 10. M
- 78 *Lygenopteris oldhamia* old stem, T.S. M
- 79 *Lygenopteris oldhamia*, Tangential Long section through wood, x 1½. M
- 80 *Lygenopteris oldhamia*, Radia L.S., Section through wood, x 1½. M
- 81 *Lygenopteris oldhamia* (*Kaloxylon*), Root, T.S., x 15. M
- 82 *Lygenopteris oldhamia*, leaves, T.S., x 10. M
- 83 *Lygenopteris oldhamia*, T.S., leaf rachis, x 10. M
- 84 *Lygenopteris oldhamia* (*Telangium Scottii*), Synangia with microspores. M
- 85 *Lagenostoma ovoides* (Seed of *Lygenopteris*), in L.S., through Microspyle, x 10. M
- 86 *Lagenostoma ovoides* (Seed of *Lygenopteris*), in L.S., (Model). M
- 87 *Physostoma elegans*, T.S., base of Pollen Chamber. M
- 88 *Physostoma elegans*, V.S., Seed and Pollen Chamber. M
- 89 *Neuropteris heterophylla*, Part of frond. M
- 90 *Neuropteris tenuifolia*, part of frond. M
- 91 *Alethopteris decurrens*, Part of frond. M
- 92 *Alethopteris lonchitica*, Part of frond. M
- 93 *Medullosa anglica*, stem, T.S., x 1½. M
- 94 *Medullosa anglica* (*Myeloxylon*), Leaf Rachis, T.S., x 6. M
- 95 *Trigonocarpus Parkinsoni*, Seeds in situ M
- 96 *Trigonocarpus Parkinsoni*, L.S., Seed. M
- 97 *Trigonocarpus* and *Araucaria*, Seeds for comparison. M
- 98 *Pachitesta gigantea*, Seed in L.S. (Model). M
- 99 *Stephanospermum* Seed in L.S. (Model). M
- 100 *Mitrospermum compressum*. L.S. Seed. x 10. M
- 101 *Archeopteris hibernicus*, part of frond. M
- 102 *Mariopteris muricata*, part of frond. M
- CORDAITALES.**
- 103 *Cordaites* sp., stem, T.S. M
- 104 *Cordaites Sternbergia*, east of Pith cavity. M
- 105 *Mesoxylon poroxylides* and *M. multirame*, Stems in T.S., x ½. M
- 106 *Cordaites brassifolius*, leaf fragment. M
- 107 *Cordaites pricipalis*, leaves. M
- 108 *Cordaites* sp., leaves in T.S., x 10. M
- 109 *Cordaites* sp., roots, T.S. x. M
- 110 *Amyelon radicans*, root of one of the Cordaites in T.S., with *Cardiocarpus* (Seed of one of the Cordaites, T.S.). M
- 111 *Cardiocarpus* seed in L.S. (Model). M
- 112 *Zamia* (Modern Cycad) Seed, L.S. (Model). M
- CONIFERÆ.**
- 113 *Walchia piniformis* from Lodona, Herault, France, Permian. M
- 114 *Coniferous Wood*, T.S., with Annual Rings, Lia, Whitby. M
- 115 *Coniferous Wood*, Radial, L.S., outer part Jet, Lia, Whitby. M
- 116 *Coniferous Wood* in T.S., Rocky Mountains. M
- 117 *Coniferous Wood* in L.S., Rocky Mountains. M
- 118 *Silicified Wood* in L.S., with insect borings and excreta. M
- 119 *Silicified Wood* in T.S., with insect borings and excreta. M
- SECTIONS OF COAL—PHOTOMICROGRAPHS**
- 120 *Trencherbone Coal*, Atherton, Lancs., parallel to bedding. M
- 121 *Trencherbone Coal*, Atherton, Lancs., vertical to bedding. M
- 122 *Cannel Coal*, Bolton, parallel to bedding. M
- 123 *Cannel Coal*, Bolton, vertical to bedding. M
- 124 *Arley Mine*, Bolton, parallel to bedding. M
- 125 *Arley Mine*, Bolton, vertical to bedding. M
- 126 *Main Coal*, Sterling, parallel to bedding. M
- 127 *Main Coal*, Sterling, vertical to bedding. M
- 128 *Yard Seam*, Newcastle, Northumberland, parallel to bedding. M
- 129 *Yard Seam*, Newcastle, Northumberland, vertical to bedding. M
- 130 *Bullhurst Coal*, Stoke-on-Trent, parallel to bedding. M
- 131 *Bullhurst Coal*, Stoke-on-Trent, vertical to bedding. M
- PRIMITIVE PLANT REMAINS FROM THE RHYNIA BEDS.**
- 141 *Rhynia Gwynne-Vaughani*, T.S. Stem. M
- 142 *Rhynia major*, T.S. Stem. M
- 143 *Asteroxylon*, T.S. Stem. M

Lecture Lanterns in various patterns—See Catalogue F.

**Section GE 12—PHOTOGRAPHS IN INDIA.**

A fine series never before issued as Lantern Slides. From negatives by Mr. T. D. LA TOUCHE, M.A. (Cantab), F.G.S., etc., late Superintendent, Geological Survey of India.

Views of Geological Interest are marked ...	G
Architectural or Structural ... ..	A
Landscapes ... ..	L
Ethnological ... ..	E

Price : Plain 1/6 each. Hand-painted 3/- each.

**VIEWS IN KASHMIR.**

- |                                                                                    |   |
|------------------------------------------------------------------------------------|---|
| 1 Chinara tree (Oriental Plane, <i>Platanus orientalis</i> ) at Kishtwar, Kashmir. | B |
| 2 Mahomedan mosque at Kishtwar, Kashmir.                                           | A |
| 3 The Chenah valley above Kishtwar, Kashmir.                                       | G |
| 4 Village of Gulahgarh, in Padar, Kashmir.                                         | A |
| 5 Dove-cote and serai at Gulahgarh, in Padar, Kashmir.                             | A |
| 6 View on the Bhutna river, Padar, Kashmir.                                        | L |
| 7 Wooden temple at Chishoti, Bhutna valley, Kashmir.                               | A |
| 8 The Sapphires mines of Padar, Kashmir.                                           | G |
| 9 Ascent to the Hagshu La, Zanskar range, Kashmir.                                 | G |
| 10 Ice fall on the Umasi glacier, Zanskar range, Kashmir.                          | G |
| 11 Crest of the Umasi La, 17,369ft., Zanskar range, Kashmir.                       | G |
| 12 The Umasi La, Padar, Kashmir, fr. the Sapphires mines.                          | L |
| 13 Village of Turi, in Zanskar.                                                    | L |
| 14 Village of Photoksar, Zanskar.                                                  | L |
| 15 Earth pillars, near Turi, Zanskar                                               | G |
| 16 Chorten (Buddhist monument) at Padam, Zanskar.                                  | A |
| 17 The Singhe La, 16,600ft., and peak Z <sup>4</sup> , Zanskar.                    | G |
| 18 Peak Z, Zanskar.                                                                | G |
| 19 Jhula (rope bridge) at Gulahgarh in Padar, Kashmir.                             | A |
| 20 Jhula (rope bridge) at Padam, Zanskar.                                          | A |
| 21 Jhula (rope bridge), near Turi, Zanskar.                                        | A |
| 22 Bridge at Gulahgarh in Padar, Kashmir.                                          | A |
| 23 Bridge at Kanibal, Kashmir valley.                                              | A |
| 24 Bridge at Yeichung, Zanskar.                                                    | A |
| 25 Old wooden bridge at Ramhand, on the Chenah.                                    | A |
| 26 Primitive bridge on the Chenah, nr. Aroas, Jammu.                               | A |
| 27 Achibal, Kashmir valley.                                                        | A |
| 28 Jammu, general view.                                                            | L |
| 29 Hindu temples at Jammu.                                                         | A |
- VIEWS IN KULU AND LAHOUL.**
- |                                                                  |   |
|------------------------------------------------------------------|---|
| 30 Hindu temple at Kot, Simla-Kulu road.                         | A |
| 31 The Beas valley in Kulu, from Raisen.                         | L |
| 32 Nagar Castle, Kulu.                                           | A |
| 33 Hindu temple at Nagar, Kulu valley.                           | A |
| 34 Village of Jagatsukhi, Kulu valley.                           | A |
| 35 Terminal moraine of an ancient glacier, Kulu valley.          | G |
| 36 Cliffs near Rala, Kulu valley.                                | G |
| 37 Ascent to the Rohtang pass, 13,000ft., from the south, Kulu.  | L |
| 38 Crest of the Rohtang pass, 13,000ft., Kulu.                   | L |
| 39 Snowy range in Lahoul.                                        | L |
| 40 Tower at Gundia, Chenah valley, Lahoul.                       | A |
| 41 The village of Kyelang, Lahoul.                               | L |
| 42 Moravian mission house at Kyelang, Lahoul.                    | A |
| 43 Group of Lahoulis.                                            | E |
| 44 Fan talus in the Bhaga valley, Lahoul.                        | G |
| 45 View on the upper Mail, Dalhousie.                            | L |
| 46 Forest officer's bungalow at Kalatop, near Dalhousie, Punjab. | P |

**VIEWS IN THE PLAINS OF INDIA.**

- |                                                                                                                         |   |
|-------------------------------------------------------------------------------------------------------------------------|---|
| 47, 48, 49, 50. Four views of a dissected pericline, or dome-shaped elevation (whaleback), near Rindli, in Baluchistan. |   |
| 47 General view from outside the pericline.                                                                             | G |
| 48 View from inside.                                                                                                    | G |
| 49 Another view from inside.                                                                                            | G |
| 50 Central core.                                                                                                        | G |
| 51 The Tiri Chuakhel, Sherani Hills. N.-W. F. Province.                                                                 | G |
| 52 Plateau of Ara, Salt Range, Punjab.                                                                                  | G |
| 53 View near Ara, Salt Range, Punjab.                                                                                   | G |
| 54 Camp at Ara, Salt Range, Punjab.                                                                                     | G |
| 55 Sukkur, Upper Sind, general view.                                                                                    | L |
| 56 The Indus at Sukkur, Upper Sind.                                                                                     | L |
| 57 The Minaret at Sukkur, Upper Sind.                                                                                   | A |
| 58 House of a wealthy native at Sukkur, Upper Sind.                                                                     | A |
| 59 House at Sukkur, Upper Sind.                                                                                         | A |
| 60 Boat-building yard at Miami, near Sukkur, Upper Sind.                                                                | L |
| 61 Native Boats on the Indus, Sukkur, Upper Sind.                                                                       | L |
| 62 Rohri, Upper Sind.                                                                                                   | L |
| 63 Mohpani, Central Provinces.                                                                                          | L |
| 64 Mohpani, Central Provinces.                                                                                          | L |
| 65 The Sita Riva river, Mohpani, C.P.                                                                                   | L |
| 66 The Sita Riva river, Mohpani, C.P.                                                                                   | L |

**VIEWS IN ASSAM.**

- |                                                                 |   |
|-----------------------------------------------------------------|---|
| 67 Group of Garos.                                              | E |
| 68 Group of Garo Dancing Girls and Musicians, Tura, Garo Hills. | E |
| 69 Tura, Garo Hills, Assam.                                     | E |
| 70 Village of Emangri, Garo Hills, Assam.                       | L |
| 71 Nohfante (Bachelors' house), at Emangri, Garo Hills.         | E |
| 72 View on the Sumesari river, Garo Hills.                      | L |
| 73 On the Sumesari river, Garo Hills.                           | L |
| 74 The Sumesari river at Siju, Garo Hills.                      | L |
| 75 Village of Siju, Garo Hills.                                 | L |
| 76 Dug-out canoe on the Sumesari river, Garo Hills.             | E |
| 77 Entrance to the Dohakhot (Bat's Cave), nr. Siju, Garo Hills. | G |
| 78 In the gorge of the Sumesari, Garo Hills.                    | L |
| 79 Masumata, Garo Hills.                                        | L |
| 80 Cane bridge on the Ganol river, Garo Hills.                  | A |
| 81 Cane bridge on the Ganol river, Garo Hills.                  | A |
| 82 Borang (Tree hut), Garo Hills.                               | A |
| 83 Rubber tree ( <i>Ficus elastica</i> ), Garo Hills.           | B |
| 84 Garo Hills Frontier Police.                                  | E |
| 85 Memorial stones at Laitlyngkot, Khasi Hills.                 | E |
| 86 Memorial stones at Maomluh, Khasi Hills.                     | E |
| 87 Village of Maosmai, Khasi Hills.                             | E |
| 88 Khasi coolies at a river crossing, Khasi Hills.              | E |
| 89 A mid-day halt on the Umhlei river, Khasi Hills.             | E |
| 90 Embel river at Rihang Bazaar, Khasi Hills.                   | L |
| 91 Khasi dancing party, Nongkhrem, Khasi Hills.                 | E |
| 92 The Woodthorpe Falls, near Shillong, Khasi Hills.            | L |

All Slides may be had Plain—unless otherwise stated.  
 P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section.  
 L.S.—Longitudinal Section.

Section GE 12—Photographs in India—Continued.

93 The Darrah Falls, nr. Shillong, Khasi Hills.	L	176c Formation of Natural Bridge, Nam Ma	
94 View in the Khasi Hills, nr. Kalapani.	G	river.	G
95 Natural Limestone Arch, Gherra Punji, Khasi Hills.	G	177 Railway cutting in travertine.	G
96 Pipes in Limestone, Cherra Punji, Khasi Hills.	G	178 Railway cutting in travertine.	G
97 The Brahmaputra river at Tezpur, Assam.	L	179 Ferry at Hsipaw.	L
98 The Barailma rapids on the Diyung river, North Cachar Hills, Assam.	L	180 The Salween at Hsoipket.	L
99 Diyungmukh, North Cachar Hills, Assam.	L	181 A hill stream.	L
100 Dihungi, on the Diyung, North Cachar Hills.	L	182 View near Kehsi Mansam.	L
101 Ledo coal mine, Makum coalfield, Assam.	G	183 View near Kehsi Mansam.	L
102 Group of Singphos.	E	184 Loi Twang.	L
103 A Singpho Chief.	E	185 Loi Sakh.	L
104 Group of Nagas.	E	186 The valley of Lukhkal.	G
105 Survey mark on Malum, Patkai Range, Assam.	E	187 "Swallow-hole" in the Lukhkal valley.	G
106 The Dehing river, Singpho Hills, Assam.	L	188 Village of Man Sé.	L
107 Camp in the Singpho Hills, Assam.	L	189 Inclined Tertiary beds at Man Sé.	G
108 Group of Akas.	E	190 View on the Shan Plateau.	L
109 The Lonar Lake, Central Provinces.	G	191 Mansang and Loi Ling.	L
110 Temple at Lonar, Central Provinces.	A	192 Bawdwin, general view.	L
<b>VIEWS IN WESTERN RAJPUTANA, THE INDIAN DESERT.</b>			
111 Jodhpur Fort.	A	193 Bawdwin, the Amphitheatre.	G
112 Jodhpur Fort, interior.	A	194 Bawdwin, Chinese smelting furnace.	G
113 Balcony in garden at Mandor, near Jodhpur.	H	195 Bawdwin, Kaolin smelting furnaces.	G
114 Ajit Singh's tomb, Mandor.	A	196 Bawdwin, Ore dressing floors.	G
115 Gateway of a house in Jodhpur.	A	197 Bawdwin, Cupel furnace.	G
116 Garden House in Jodhpur.	A	198 Bawdwin, Chinese cupel furnaces.	G
117 Ruins of Jain temples in the Barmer desert.	A	199 Bawdwin, Chinese bridge.	L
118 Ruins of Jain temples in the Barmer desert.	A	200 The Mansing Falls, General view.	L
121 The fort of Siwana.	L	201 The Mansing Falls, General view.	L
122 Village of Nagar.	L	202 The Mansing Falls, upper fall.	L
123 Village of Barmer.	L	203 The Mansing Falls, second fall.	L
124 Chasm formed by the weathering out of a dyke intrusive in rhyolites.	G	204 The Mansing Falls, lowest fall.	L
125 Hill of granite at Kaonla.	G	206 Travertine dams near Wetwin.	G
126 Granite hills at Erlapura.	G	207 Travertine dams, showing method of growth.	G
127 Columnar rhyolites at Korna.	G	208 Travertine dams at junction of Nam Tu and Nam Ma.	G
<b>VIEWS IN THE BHOT MAHALS, KUMAON, CENTRAL HIMALAYAS.</b>			
151 The Kali valley.	L	209 Travertine dams in the Nam Ma.	G
152 The Dharma valley above Sabala	L	210 Travertine dams near Loikhaw.	G
153 Cliffs at Namgling.	G	211 Fishing weir on the Nam Ma.	G
154 The Lissar valley.	L	212 Loi Han Hun, a Tertiary volcano.	G
155 The Bamhhadhura range.	L	213 Columnar basalt, Loi Han Hun.	G
156 Head of the Lissar Valley.	L	214 Columnar basalt, Loi Han Hun.	G
157 Contorted Permo-Triassic beds.	G	215 The Nam Tu at Tong Ang.	L
158 Glacier near Mabung.	G	216 Fault scarp at Pongwa.	G
159 Profile of cliffs opposite Mabung.	G	217 Shan Gold-washers.	G
160 Head of the Dharma valley.	L	218 Gold dredging machine.	G
161 Earth pillars in the Lissar valley.	G	<b>VIEWS IN THE PUNJAB SALT RANGE.</b>	
162 The Ralam Pass from the East.	L	219 Southern scarp of Salt Range.	L
163 Camp at foot of the Ralam Pass.	L	220 Coal mines at Tejuwala.	G
164 The Ralam Pass from the West.	L	221 Ravine at Tejuwala.	L
165 The Ralam valley.	L	222 Tejuwala scarp.	L
166 Valley of the Gori Gunga.	L	223 Coal mine at Jhakar Kot.	G
167 The Gori Gunga near Mansiari.	L	224 Pisolithic clays at Jhakar Kot.	G
168 Kulhari from Mansiari.	L	225 East end of Chanlot Hill.	L
169 The Kamgunga valley.	L	226 Carboniferous rocks at Paill.	G
170 Trisol, from near Trejam.	L	227 Trough valley, near Paill.	G
171 The Sarju R. at Bagesar.	L	228 Narsingphoar ravine.	L
172 The snowy range from near Bagesar.	L	229 Waterfall in Narsingphoar ravine.	L
173 The snows from Binsar.	L	230 View in Narsingphoar ravine.	L
174 Bridge on the Almora road.	A	231 View in Narsingphoar ravine.	L
<b>VIEWS IN THE NORTHERN SHAN STATES, BURMA.</b>			
175 The Gokteik Gorge. Building the Viaduct.	L	232 The Chamli plateau.	L
176 The Gokteik Gorge. View from the Natural Bridge.	L	233 The Chamli plateau and Kabaki syncline.	L
		234 The Khotaka Kahar (Lake).	L
		235 The Kabaki Kahar.	L
		236 The Son-Sakesar Kahar.	L
		237 Sakesar Hill.	L
		238 Tilted beds of alluvium.	L
		239 The Kocho Kahar.	L
		240 Vertical beds of Nummulitic Limestone.	G
		241 The Jalar Kahar.	L
		242 Loess beds in the Jalar valley.	G
		243 Loess beds in the Jalar valley.	G
		244 The Katwahi Pass.	L
		245 Salt Springs.	L
		246 Earth pillars near Jhakar Kot.	G
		247 The Vassal inlier of Salt marl.	G
		248 Gorge in Salt marl, Vassal.	G

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249 The Nilawan ravine.	L	280 Bhotang copper mines.	G
250 The Kalar Kahar.	L	281 Entrance to native addi, Bhotang.	O
251 The Kalar Kahar.	L	282 Landslip on the Rangpo river.	O
252 Dulwal.	L	283 Landslip on the Rangpo river.	O
253 The Choya Saidan Shah valley.	L	285 Coal seam on Great Rangit river.	O
254 Waterfall at Choya Saidan Shah.	L	286 Native copper mine, Jugdum.	O
255 Boulder bed near Choya Saidan Shah.	G	287 Native copper mine, Dischu.	G
256 Katas.	L	288 View in Tista valley.	L
257 Khusak Hill and Fort, from the south.	L	290 Camp on Rangbi river.	L
258 Khusak Hill and Fort, from the north.	L	291 Head of Rangbi valley.	L
259 Chel Hill.	L	292 Rhododendrons and Pines.	L
260 The Siki anticline.	G	293 Tibetan huts at Yampung.	L
261 The Bhaganwala ravine.	L	294 Memang Pokri (Tarn).	L
262 Cambrian strata at Bhaganwala.	G	295 Matemang Pokri.	L
263 Cliffs at Bhaganwala.	O	296 The Chamabab La (Pass).	L
264 The Fort, Bhaganwala.	L	297 Gamothang.	L
265 The Khuddera.	L	298 Sonak Pokri.	L
266 View looking up Bhaganwala ravine.	L	299 Valley of the Rathong Chu (stream).	L
267 Profile of scarp of Range, west of Jutana.	G	300 The Priag Chu and Pandim.	L
268 Jutana Gorge.	L	301 Pandim from Alukthang.	L
269 Jutana Gorge.	L	302 Kinchinjunga from Alukthang.	L
270 View in Khewra ravine.	L	303 Alukthang glacier.	L
271 Khewra Salt mines, general view.	L	304 Moraines on the Alukthang glacier	L
272 Entrance to Khewra Salt mines.	L	305 The Gulcha glacier.	G
273 Inclines on tramway at Dandot.	L	306 Stratification in ice cliff.	L
274 Inclines on tramway at Dandot.	L	307 The Katsupari Lake.	G
275 Kafas scarp from Dandot.	L	308 Cane bridge on the Tista.	A
<b>VIEWS IN THE SIKKIM HIMALAYA.</b>			
276 The Tista Bridge.	L	309 Waterfalls on the Lachen road.	L
277 The Great Rangit at Mangtar.	L	310 Gorge of the Tista, above Cheung-tong.	L
278 The Mangtar Bridge.	L	311 Snow bridge in the Zemu valley.	L
279 Bhotang copper mines.	G	312 Snout of the Zemu glacier.	G
		313 Ice Cave, Zemu glacier.	O
		314 View of the Zemu valley.	G

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2 Rainfall Map of England and Wales.	D	27 Atlantic Ocean, Map showing Currents.	D
3 Rainfall and Tidal Map, British Isles.	D	28 Altitude of Sun at Midsummer and Mid-winter.	D
4 World Map, Isothermal Lines.	D	29 Midnight Sun, North Cape, Norway.	P
5 World Map, Isothermal Lines.	D	30 Moon's attraction on Waters of Earth.	D
6 World Map, Isothermal Lines.	D	31 Earth and Moon, cause of Spring and Neap Tides.	D
7 World Map, Isogonic Lines.	D	32 Earth and Moon, Priming and Lagging of Tides.	D
8 World Map, Atmospheric Pressure, July.	D	33 Earth and Moon, Diurnal inequalities of Tides.	D
9 Atmospheric Pressure at different altitudes.	D	34 Course of Tidal Wave, British Isles.	D
10 Comparison Table of Cyclones and Anticyclones.	D	35 Aegir (Tidal Wave) on River Trent.	P
11 Passage of Cyclones and Anticyclones across British Isles. Mechanical Slide coloured.	8/6	36 Section showing cause of rise of water in Artesian Wells.	D
12 Monsoon at Sea, Colombo.	P	<b>SNOW AND ICE.</b>	
13 Magnetic Chart, British Isles.	D	37 Hoar Frost on Trees.	P
14 Diagram to explain Magnetic Declination.	D	38 Hoar Frost on Plants.	P
15 Magnetic Dip Circle.	D	39 Snow crystals.	D
16 Lightning Flash.	P	40 Swiss Snow Scene.	P
17 Theodolite.	D	41 Swiss Snow Scene.	P
18 Barometer, Aneroid, construction.	D	41a Snowfield.	P
19 Barometer, Mercury, Fortins.	D	42 Mt. Blanc, Range from Cabane de la Guelas.	P
20 Barometer, Mercury, Syphon.	D	43 Mer de Glace, showing Tongue.	P
21 Barograph.	D	44 Mer de Glace, from Mauvals Pas (Serracs).	P
22 Barograph Chart (1 week).	D		
23 Aurora Borealis (Draped Aurora).	D		
24 Aurora Borealis (Rayed Aurora).	D		
25 Atlantic Ocean, plan showing depths.	D		

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**Section MM 1—Physical Geography—Continued.**

45 Mer de Glace, Wave-like Surface.	P	58 Victoria Falls, Main Fall from South Shore, Woking, up the chasm.	P
46 Mer de Glace and Summit of Mt. Blanc.	P	59 Victoria Falls, Main Fall from Rain Forest.	P
47 Trient Glacier, showing terminal moraine.	P	60 Victoria Falls, Rainbow Fall from Danger Pond, Livingstone Island.	P
48 Iceberg.	P	61 Rain Forest, Victoria Falls, Zambesi.	P
<b>RIVERS AND WATER.</b>			
(See also various other parts of the Catalogue).			
49 The Strid, River Wharfe, Yorkshire.	P	62 Victoria Falls, Zambesi, Boiling Pot and Gorge.	P
50 The Strid, River Wharfe, Yorkshire.	P	63 Victoria Falls, Zambesi, The Bend.	P
51 R. Wharfe, just above the Strid.	P	64 Zambesi Gorge, from Palm Cleop, looking towards the gap.	P
52 Mill Ghyll Force, Wensley Dale, Yorks.	P	65 Victoria Falls, Zambesi, Railway Bridge, in construction.	P
53 Whitfield Force, Wensley Dale, Yorks.	P		
54 Waterfall, Valley of Desolation, Bolton Abbey, Yorks.	P	66 Niagara Falls below Suspension Bridge.	P
55 Victoria Falls, Zambesi Plan.	D	67 Niagara Horse Shoe Falls, Winter.	P
56 Victoria Falls.	P	68 Niagara American Falls, Winter.	P
57 Victoria Falls, from above.	P	69 Niagara American Falls, general view.	P

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4 Section across the Pennines showing Coal-basins.	22 Lines connecting the Mersey and Ribble valleys.
5 A Geographer's Geological Map of Lancs.	23 Population map of the North of England.
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7 A Geographer's Geological Map of Northumberland and Durham.	25 General industrial map of the North of England.
8 A boring for Coal showing the strata passed through.	26 Textile industries.
9 "Hidden Coal-fields" of East and Western Plains.	27 Cotton Trade of Lancashire; its distribution.
10 Table of products obtained from coal. Coke furnaces and their bye-products.	28 Woollen Trade of West Riding; its distribution.
11 Iron ore of North of England.	29 Chemical Trade of the Mersey.
12 Iron and Steel manufacture of North of England.	30 Paper Trade of Lancashire; connection with water supply.
13 Furness, and its supply of raw materials.	31 Leather Trade of Lancashire and of West Riding.
14 Lancashire its Highlands and Lowlands.	32 Glass-making of the North of England.
15 Yorkshire; its Highlands and Lowlands.	33 Soap-making of the North of England.
16 Northumberland and Durham; their Highlands and Lowlands.	34 Agriculture of the North of England.
17 A rainfall map of the North of England.	35 Shipping of the North of England; chief ports and connections.
18 Great Railways of the North; their relation to structure, etc.	36 Tonnage of the great ports.

**Section MM 3—CLOUD PHOTOGRAPHS.**

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1 Stratus Clouds—Rising Sun.	<p><b>THE HELM CLOUD OF THE PENNINES.</b></p> <p>31 Helm Wind, Section to show how the Cloud is formed.</p> <p>32 Helm Cloud. Bar in process of breaking up. The wind will then rush right across the Eden Valley.</p> <p>33 Helm Cloud settled down on the Pennines nearly to bottom—showing Bar breaking up.</p> <p>34 Helm Cloud settled down on Pennines. The Bar about three miles from hills, and what is known locally as a "Black Helm."</p> <p>35 Helm Cloud hidden behind Bar, wind not reaching Eden, as shown by frost crystals.</p>
2 Stormy Sunrise at sea.	
3 Strato-nimbus—Rain Clouds.	
4 Strato-nimbus Clouds, clearing away.	
5 Nimbus changing to Strato-cumulus Clouds.	
6 Large Cumulus Clouds.	
7 Festeoned Cumulus Clouds.	
8 Fantastic Storm Cloud No. 1.	
9 Fantastic Storm Cloud No. 2.	
10 Gathering Rain Clouds—Evening.	
11 Cirro Cumulus Sky—Sea View.	
12 Cirrus, or Mackerel Sky—Morning.	
13 Cirrus Clouds covering Evening Sky.	
14 A coming Storm.	
15 Storm Clouds passing away.	
16 Cumulus-nimbus Clouds—Calm Sea.	
17 Sunlight breaking through Heavy Clouds.	
18 Cumulus Clouds and troubled waters.	

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## Section MM 4—VOLCANOES AND GEYSERS.

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|-----------------------------------------------------|---|--------------------------------------------------|
| 1 World Map—Distribution of Active Volcanoes.       | D | 17 Souffrière, eruption of.                      |
| 2 Section of a Volcano.                             | D | 18 Vesuvius in 1906.                             |
| 3 Section of a Volcano.                             | D | 19 Vesuvius in 1907, after eruption.             |
| 4 Section of Extinct Volcano—Clee Hill, Shropshire. | D | 20 Ottagiano (Vesuvius), house crushed by ashes. |
| 5 Hot Spring, Honolulu.                             |   | 21 Ottagiano (Vesuvius), houses unroofed.        |
| 6 Great Fountain Geyser, Yellowstone Park.          |   | 22 Ottagiano (Vesuvius), lava in streets.        |
| 7 Old Faithful Geyser, Yellowstone Park.            |   | 23 Stromboli in eruption.                        |
| 8 Great Mud Geyser, Whakarewarewa, New Zealand.     |   | 24 Etna in eruption.                             |
| 9 Mt. Tarawera, Great Crater, New Zealand.          |   | 25 Krakatoa before eruption.                     |
| 10 Mt. Tarawera, Exterior of Crater, New Zealand.   |   | 26 Krakatoa during eruption.                     |
| 11 Waitaki in eruption, New Zealand.                |   | 27 Fusi-yama, Japan.                             |
| 12 St. Vincent, Chateaubelair.                      |   | 28 Volcano, Kilauea, Hawaii.                     |
| 13 St. Vincent, Calliaqua.                          |   | 29 Volcano, Kilauea, crater.                     |
| 14 St. Vincent, Road from Calliaqua to Georgetown.  |   | 30 Volcano, Kilauea, lava chasm.                 |
| 15 Souffrière, Crater in 1824.                      |   | 31 Kilauea, lava flow, beginning.                |
| 16 Souffrière, Crater in 1902.                      |   | 32 Kilauea, lava flow, a few minutes later.      |
|                                                     |   | 33 Extinct Volcano, Mauna Kea.                   |
|                                                     |   | 34 Tenerife, the Peak.                           |
|                                                     |   | 35 Popocatepetl, Mexico.                         |

## Section MM 5—EARTHQUAKES.

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- THE SAN FRANCISCO EARTHQUAKE, APRIL 18th, 1906.**
- Map of World, showing Earthquake areas.
  - San Francisco, view of the City before the Earthquake.
  - The City Hall, from Market Street, after the Earthquake, a mass of ruins; the dome, however, being uninjured.
  - The City Hall, from Larkin Street.
  - San Francisco, from Nob Hill; shows the Harbour, ruins in foreground, and fire still in progress.
  - View from Nob Hill; Fairmount Hotel in distance, and ruins of many magnificent residences.
  - The finest residential quarter, a pile of ruins.
  - Corner of Sansome and California Street; ruin of business district.
  - Market Street, from the Ferris, showing how streets sank and tramralls were twisted.
  - Market Street and ruins of Palace Hotel.
  - Ruins of the "Emporium" Building.
  - Ruins of the First Baptists' Church, Oakland.
- THE JAMAICA EARTHQUAKE, JANUARY 14th, 1907.**
- Kingston, view before the Earthquake.
  - Kingston, ruins of Harbour Street, from the Treasury.
  - Kingston, ruins of Myrtle Bank Hotel.
  - Kingston, ruins of Harbour Street, from Myrtle Bank Hotel.
  - Kingston, ruins of Hanover Street, from Harbour Street.
  - Kingston, ruins of Roman Catholic Cathedral.
  - Kingston, ruins of Sailors' Rest.
  - Kingston, ruins of Wesleyan Church.
  - Kingston, ruins of Church Street.
  - Kingston, ruins of Coke Memorial Church.
  - Kingston, ruins of Coke Memorial Church, interior.
  - Kingston, ruins of Parish Church Tower.
  - Kingston, ruins of G.P.O. and Town Hall.
  - Kingston, ruins of racecourse, with refugees' tents.
- THE MESSINA EARTHQUAKE.**
- Messina, from the sea, before the Earthquake.
  - Messina, ruins on sea front.
  - Messina, ruins of Cathedral, interior.
  - Messina, survivors amongst ruins.
  - Messina, survivors camping in the ruins.
  - Messina, "wrecked houses."
  - Messina, street in ruins.
  - Messina, view across Straits.
  - Messina, houses in ruins.
  - Messina, large house in ruins.
  - Messina, street scene.
  - Messina, searching the ruins.
- INDIA—GREAT EARTHQUAKE OF 12th JUNE, 1897.**
- The Cathedral, Calcutta.
  - The Town Hall, Calcutta.
  - Offices of the "Indian Daily News," Calcutta.
  - Sand crater at Rohmari.
  - Fissure at Rohmari.
  - The Observatory, Dhubri.
  - The Jubilee Well, Dhubri.
  - Goalpara Bazaar.
  - Fissure at Goalpara.
  - The Treasury, Goalpara.
  - Hindu temple.
  - Gauhati, general view.
  - The Kutcherry, Gauhati.
  - The Kutcherry, Gauhati.
  - Bridge near Gauhati.
  - Bridge near Gauhati.
  - The Ghat, Gauhati.
  - Tezpur Church.
  - Landslip near Shillong.
- A new series of Slides dealing with the recent disaster in Japan. Plain Slides 3/6 each. Hire fee for the Series 7/6.**
- Tokio. Showing the ruins in the retail district, and view of the Tokio Canal.
  - Tokio. View from Ueno Station showing the centre of the city utterly devastated. Also relief men at work.

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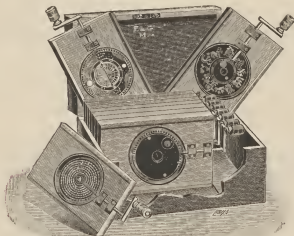


Section MM 5—Earthquakes—Continued.

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>62 Tokio. The Police Station and Imperial Theatre on fire.</p> <p>63 Tokio. Railway Station and buildings wrecked. Showing how huge masses of roofing and buildings were smashed.</p> <p>64 Yokohama. A ruined street in the native part.</p> <p>65 Yokohama. Women refugees with their few belongings fleeing from the doomed city.</p> <p>66 Yokohama. A wrecked bridge and a never-ending stream of inhabitants leaving the city.</p> <p>67 Native men and women with soldiers, carrying children, leaving the city.</p> <p>68 A wrecked cotton mill at Koyan, where over 500 girl employees were killed.</p> | <p>69 A fishing village near Tokio completely wrecked.</p> <p>70 Earthquake cracks of huge dimensions in a country road.</p> <p>71 Relief work. The Japanese Military giving rations to the starving population.</p> <p>72 Yokohama Harbour, which was shattered by the tidal wave and earthquake. A wrecked pier.</p> |
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**EARTH MOVEMENT RECORDS.**

- 81 Seismograph for Recording Earth Tremor.  
 82 Magnetic Curves of Great Storm, Sept., '09 (Stonyhurst).  
 83 Seismograph records of Earth Tremors, 1909 and 1910 (Stonyhurst).  
 84 Seismograph records of Earth Tremors.



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1 The Story of the Heavens.	D
2 Telescope, Meeanee Observatory, Napier, N.Z.	P
3 Stonyhurst College, Astronomical Observatory.	P
4 Stonyhurst College, 15in. equatorial.	P
5 Stonyhurst College, Meteorological Observatory.	P
6 The Solar System.	D
7 Distance of the Planets from the Sun.	D
8 Relative Sizes of Sun and Earth.	D
9 Relative Sizes of Sun and Planets.	D
10 Comparative Size of Earth and Sun.	D
11 Earth's Passage round the Sun.	D
12 Diagram illustrating Kepler's Second Law.	D
13 Right Angle, divided into 10 parts.	D
14 Various Sections of a Cone.	D
15 Phases of the Moon.	D
16 Diagram to illustrate Parts of a Shadow.	D
17 Eclipses of Sun and Moon.	D

**THE SUN AND SOLAR ECLIPSES.**

23 Changes in Sun Spot (Stonyhurst), September 15th, 15th, 29th, and October 2nd, 1882.	P
24 Changes in the Great Sun Spot (Stonyhurst), April 16th, 15th, 20th, 21st, 1882.	P
25 Sun Spot & Faculae, December 6th, 1884.	P
26 Sun Spot and Faculae, November 29th, 1884.	P
27 Sun Spot and Faculae, November 28th, 1884.	P
28 Sun Spot and Faculae, September 7th, 10th, 12th, 15th, 1884.	P
29 Sun Spot and Faculae, September 16th, 17th, 1884.	P
30 Sun Spot and Faculae, October 5th, 1884.	P
31 Sun Spot and Faculae, November 1st, 1884.	P
32 Large Sun Spot, 20th June, 1889, Stonyhurst.	P
33 The Sun, 31st August, 1908, Meeanee Observatory, Napier, N.Z.	P
34 Group of Sun Spots, Meeanee Observatory, Napier, N.Z.	P
35 Part of Sun: Spots and Faculae, Meeanee Observatory, Napier, N.Z.	P
36 Part of Sun, 25th August, 1908, Meeanee Observatory, Napier, N.Z.	P
37 Photosphere or Visible Surface of Sun, Meeanee Observatory, Napier, N.Z.	P
38 Spectroheliogram in K (calcium) light. Tortosa Observatory.	P
39 Spectroheliogram in K (calcium) light. Tortosa Observatory.	P
40 Spectroheliogram in K (calcium) light. Tortosa Observatory.	P
41 Total and Annular Eclipse of Sun.	D
42 Total Eclipse of Sun, 1890.	D
43 Solar Corona, August 30th, 1905.	D
44 Solar Eclipse, Tonga Islands, April 28th, 1911, Drawing of Corona, as observed by Capt. G. Holford, S.S. Tofua.	D
45 Solar Eclipse, Tonga Islands, April 28th, 1911. Photo, Mr. P. Baracchi; Plate "A", exposure, 3 seconds.	P
46 Solar Eclipse, Tonga Islands, April 28th, 1911. Photo, Mr. P. Baracchi; Plate "E", exposure, 3 seconds.	P

47 Solar Eclipse, Manchester, April 17th, 1912, from original photographs by H. Garnett.	P
48 Solar Eclipse, 10-55 a.m., April 17th, 1912.	P
49 Solar Eclipse, 11-30 a.m., April 17th, 1912.	P
50 Solar Eclipse, 11-30 a.m., April 17th, 1912.	P
51 Solar Eclipse, 11-50 a.m., April 17th, 1912.	P
52 Solar Eclipse, 12-0 noon, April 17th, 1912.	P
53 Solar Eclipse, 12-9 p.m., April 17th, 1912.	P
54 Solar Eclipse, 12-30 p.m., April 17th, 1912.	P
55 Solar Eclipse, 12-45 p.m., April 17th, 1912.	P
56 Solar Eclipse, 1-0 p.m., April 17th, 1912.	P
57 Solar Eclipse, 1-15 p.m., April 17th, 1912.	P
58 Solar Eclipse, 6 photos early to middle phases.	P
59 Solar Eclipse, 4 photos, later phases.	P

**THE MOON.**

65 The Moon, first quarter 7 days 15 hours (S. Raurich, Barcelona).	P
66 The Moon, 9 days 13 hours (S. Raurich, Barcelona).	P
67 Full Moon, Meeanee Observatory, Napier, N.Z.	P
68 Portion of the Moon (S. Raurich, Barcelona).	P
69 Lunar Craters (Copernicus).	D

**THE PLANETS.**

75 Mercury in transit over Sun, 14th November 1907 (S. Raurich, Barcelona).	P
76 Transit of Mercury, Barcelona, 14th November, 1907.	P
77 Mars, 1898-99.	D
78 Jupiter, showing Red Spot, 1899, May 30th, Drawing (Antoniadi).	D
79 Jupiter, showing Red Spot, 1899, June 4th, Drawing (Flammarion).	D
80 Jupiter, 1908, January 11th, Drawing (Rev. T. E. R. Phillips).	D
81 Jupiter, 1908, February 27th, Drawing (Rev. T. E. R. Phillips).	D
82 Saturn, 1876, July 7th.	D
83 Saturn.	D

**NEBULÆ.**

94 Nebulae in Orion.	P
95 Great Nebula in Orion.	P
96 Orion, Great Nebula, another photograph.	P
97 Nebula in Sagittaria.	P
98 Trifid Nebula Sagittaria.	P
99 Ring Nebula in Lyra.	P
100 Detached Nebula in Cygnus, Photograph, Heidelberg (Max Wolf).	P
101 Nebula, Messier 17.	D
102 Dumbell Nebula in Vulpecula.	P
103 Spiral Nebula, H.V. 43, Ursae Majoris.	P
104 Andromeda, Great Nebula.	r
105 Planetary Nebula H. IV., 18, Andromeda.	P
106 Network Nebula in Cygnus.	P

**STARS AND STAR CLUSTERS.**

112 Pleiades (Meeanee, N.Z.).	
113 Orion, Belt and Sword (Meeanee Observatory, Napier, N.Z.)	P
114 Southern Cross (Meeanee Observatory, Napier, N.Z.).	r

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section. L.S.—Longitudinal Section.

Section MM 7—Astronomy—Continued.

115 Portion of Milky Way in Argo (Meeanee Observatory, Napier, N.Z.).	P	153 Halley's Comet, 1910, May 7th, Tortosa Observatory.	P
116 Star cluster, M.5, Librae.	P	154 Halley's Comet, 1910, May 8th, Tortosa Observatory.	P
117 Star cluster, M.3, Canum Venaticorum.	P	155 Halley's Comet, 1910, May 15th, Grahams-town.	P
118 Great Globular Cluster in Hercules.	D	156 Donati's Comet.	D
<b>CONSTELLATIONS. -</b>			
129 Star Chart, January and February.	D	157 Donati's Comet, 29th September, 1858.	D
130 Star Chart, February and March.	D	158 Donati's Comet, 9th October, 1858.	D
131 Star Chart, March and April.	D	159 Comet, 1862, forms and positions.	D
132 Star Chart, April and May.	D	160 Comet d, 1907 (Daniel), August 14th, Photograph, Heidelberg (Max Wolf).	P
133 Star Chart, May and June.	D	161 Comet d, 1907 (Daniel), August 14th, large scale Photograph (Max Wolf).	P
134 Star Chart, June and July.	D	162 Comet, 1907 (Daniel), August 15th, 1907, Meeanee Observatory, Napier, N.Z.	P
135 Star Chart, July and August.	D	163 Comet c, 1908 (Morehouse), 27th Oct., 1908, Stonyhurst.	P
136 Star Chart, August and September.	D	164 Comet c, 1908 (Morehouse), 14th Nov., 1908, Stonyhurst.	P
137 Star Chart, September and October.	D	165 Comet c, 1908 (Morehouse), 19th Nov., 1908, Stonyhurst.	P
138 Star Chart, October and November.	D	166 Daylight Comet "A," 1910, Stonyhurst, drawing.	D
139 Star Chart, November and December.	D	167 Daylight Comet "A," 1910, Stonyhurst, drawing.	D
<b>COMETS.</b>			
145 Cometary Orbits, Elliptic, Parabolic, and Hyperbolic.	D	168 Daylight Comet, "A," 1910, 29th January, Juvisy.	P
146 Orbits of Periodical Comets.	D	169 Daylight Comet "A," 1910, 31st January, Charlottenbund.	P
147 E. Halley, portrait.	D	170 Comet "C," 1902, October 10th.	P
148 Halley's Comet, 1096 (Bayeus Tapestry).	D		
149 Halley's Comet, from old Drawing.	D		
150 Halley's Comet, February 5th, 7th, 10th, 12th, 1836.	D		
151 Halley's Comet, 1836.	D		
152 Halley's Comet. 1910, February 27th, Stonyhurst.	P		

Section MM 8—ASTRONOMY.

Photographs taken at Lick Observatory.

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1 View of the Lick Observatory.	J. M. Schaeherle, at Mina Bronces, Chile (Lick Observatory Expedition).
2 36-inch Equatorial Lick Observatory	
3 Eye-end of the 36-inch Equatorial Telescope.	16 Total Solar Eclipse of April 16th, 1893; taken with the 40-feet Photoheliograph by J. M. Schaeherle, at Mina Bronces, Chile. Exposure, 2½ secs.
4 Micrometer of the 36-inch Telescope.	17 Total Solar Eclipse of April 16th, 1893; taken with the 40-feet Photoheliograph by J. M. Schaeherle, at Mina Bronces, Chile. Exposure, 8 secs.
5 Spectroscope on the 36-inch Telescope.	18 Total Solar Eclipse of April 16th, 1893; taken with the 40-feet Photoheliograph by J. M. Schaeherle, at Mina Bronces, Chile. Exposure, 16 secs.
6 The Sun, showing Sun Spots and Faculae, August 28th, 1893, reduced from Negative taken with the Photoheliograph.	19 Photograph of the same Eclipse taken with the Dallmeyer Lens of the Lick Observatory, by J. M. Schaeherle.
7 The Sun, showing Sun Spots and Faculae, August 30th, 1893, reduced from Negative taken with the Photoheliograph.	20 Portion of the Sun's Limb during the same Eclipse, showing Solar prominences and lower portion of the Corona. Contact Print from the large Negative taken with the 40-feet Photoheliograph, by J. M. Schaeherle.
8 The Sun, showing Sun Spots and Faculae, September 3rd, 1893, reduced from Negative taken with the Photoheliograph.	21 Portion of the Sun's Limb during the same Eclipse, showing Solar prominences and lower portion of the Corona. Contact Print from the large Negative taken with the 40-feet Photoheliograph, by J. M. Schaeherle.
9 The Sun, showing Sun Spots and Faculae, September 4th, 1893, reduced from Negative taken with the Photoheliograph.	22 Portion of the Sun's Limb during the same Eclipse, showing Solar prominences and lower portion of the Corona. Contact Print from the large Negative taken with the 40-feet Photoheliograph, by J. M. Schaeherle.
(Nos. 6 to 9 show the same group of spots in its passage across the disc.)	23 Portion of the Sun's Limb during the same Eclipse, showing Solar prominences and lower portion of the Corona. Contact Print from large Neg. taken with the 40-ft. Photoheliograph, by J. M. Schaeherle.
10 Portion of the Sun's Disc, showing Groups of Spots; Contact Print from Negative taken with the Photoheliograph, May 15th, 1894.	
11 Portion of the Sun's Disc, showing Groups of Spots; Contact Print from Negative taken with the Photoheliograph, June 18th, 1894.	
12 Portion of the Sun's Disc, showing Groups of Spots; Contact Print from Negative taken with the Photoheliograph, June 19th, 1894.	
13 Portion of the Sun's Disc, showing Groups of Spots; Contact Print from Negative taken with the Photoheliograph, June 19th, 1894, enlargement of the principal group of spots shown on No. 12.	
14 Portion of the Sun's Disc, showing Groups of Spots; Contact Print from Negative taken with the Photoheliograph, June 20th, 1894. (Nos. 11 to 14 show the same groups.)	
15 Total Solar Eclipse of April 16th, 1893. Eight pictures of Solar Corona taken with the Photoheliograph Lens of 40-feet focus, by	

Opaque Lantern Screens, all sizes—See Catalogue F.

**Section MM 8—Astronomy—Continued.**

- |                                                                        |                                                                                                                                                 |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 24 The Moon, taken 1890, July, 20d. 7h. 52m.,<br>Moon's Age, 4d. 8h.   | 31 The Moon, taken 1890, Aug., 4d. 12h. 39m.,<br>Moon's Age, 19d. 8h.                                                                           |
| 25 The Moon, taken 1890, Nov., 16d. 5h. 57m.,<br>Moon's Age, 4d. 12h.  | 32 The Moon, taken 1890, Nov., 3d. 13h. 58m.,<br>Moon's Age, 21d. 5h.                                                                           |
| 26 The Moon, taken 1893, Nov., 15d. 7h. 6m.,<br>Moon's Arc, 7d. 14h.   | 33 Jupiter, taken with enlarging Lens in 36-inch<br>Telescope.                                                                                  |
| 27 The Moon, taken 1893, July, 21d. 9h. 1m.,<br>Moon's Age, 8d. 16h.   | 34 Jupiter, taken with enlarging Lens in 36-inch<br>Telescope. (Sept., 26th, 1892.)                                                             |
| 28 The Moon, taken 1891, Oct., 11d. 7h. 82m.,<br>Moon's Age, 9d. 21h.  | 35 Nebula Major, or Greater Magellanic Cloud;<br>reduced from Negative taken with the<br>Dallmeyer Lens by J. M. Sebaerbie, April<br>9th, 1893. |
| 29 The Moon, taken 1892, Mar., 8d. 13h. 16m.,<br>Moon's Age, 10d. 5h.  | 36 Clusters in Perseus; from Negative taken<br>with the 36-inch Telescope.                                                                      |
| 30 The Moon, taken 1890, Oct., 26d. 10h. 19m.,<br>Moon's Age, 13d. 1h. |                                                                                                                                                 |

# PHYSICS.

A new Series of Slides is in preparation. Meanwhile, we are including only a few in this Catalogue.

**Section MM 9—LIGHT.**

Plain Slides 1/3 each. Coloured as priced.

- |                                                                                                                                                                                              |                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 1 Solar Spectrum with Fraunhofer Lines<br>(Col.) 3/6                                                                                                                                         | 21 Prism breaking up light into Component<br>Parts. (Col.) 3/6                                                    |
| 2 Continuous Spectrum. (Col.) 3/6                                                                                                                                                            | 22 Spectroscope.                                                                                                  |
| 3 Continuous Spectrum, coloured and<br>mounted in special carrier for use<br>with the following Bright-Line Spectra<br>—which have clear lines to allow the<br>colours to show through:— 7/6 | “Direct Vision” Prisms, partly Fluid and<br>partly Glass, to replace Lantern objectives<br>—price on application. |
| 4 Calcium.                                                                                                                                                                                   |                                                                                                                   |
| 5 Potassium.                                                                                                                                                                                 |                                                                                                                   |
| 6 Sodium.                                                                                                                                                                                    |                                                                                                                   |
| 7 Iron.                                                                                                                                                                                      |                                                                                                                   |
| 8 Lithium.                                                                                                                                                                                   | } Other Spectra will be<br>made to order.                                                                         |
| 9 Gold.                                                                                                                                                                                      |                                                                                                                   |
| 10 Strontium.                                                                                                                                                                                |                                                                                                                   |
| 11 Mercury.                                                                                                                                                                                  |                                                                                                                   |

**Section MM 10—X-RAYS AND RADIOGRAMS.**

- |                                      |                                                                         |
|--------------------------------------|-------------------------------------------------------------------------|
| 1 Röntgen-Ray tubes. P               | 15 Pair of hands. M                                                     |
| 2 Induction coil. P                  | 16 Pair of hands. M                                                     |
| 3 Compact X-Ray apparatus, in use. P | 17 Normal and deformed hands. M                                         |
| <b>RADIOGRAMS.</b>                   |                                                                         |
| 4 Halfpenny in boy's throat. M       | 18 Dislocated thumb. M                                                  |
| 5 Dislocated shoulder. M             | 19 Bullet in finger. M                                                  |
| 6 Ribs and corset steel. M           | 20 Broken needle in hand. M                                             |
| 7 Ribs and spine. M                  | 21 Fractured heel. M                                                    |
| 8 Elbow joint. M                     | 22 Heel showing bone structure. M                                       |
| 9 Set bones, with pin in bandage. M  | 23 Bullet in leg. M                                                     |
| 10 Set elbow, with screw and pin. M  | 24 Broken leg bone. M                                                   |
| 11 Elbow joint. M                    | Photos taken by Radium Bromide emanations<br>through objects as under:— |
| 12 Set elbow, screws in splint. M    | 25 Cross of pure tin. M                                                 |
| 13 Set arms, screws in splint. M     | 26 Cross of sheet iron. M                                               |
| 14 Bullet in hand. M                 | 27 Cross of sheet iron with rosewood. M                                 |
|                                      | 28 Coin. M                                                              |

**Section MM 11—METALLURGY.**

Photomicrographs of etched surfaces of Steels and other Alloys, accurately made for the purpose. Plain Slides only, 1/6 each.

- |                                                     |                                                                         |
|-----------------------------------------------------|-------------------------------------------------------------------------|
| 1 Swedish bar iron—Iron 99.82%,<br>carbon, x 300. M | 8 Iron + 0.89% carbon, annealed at 900°<br>C., x 300. M                 |
| 2 Iron + 0.09% carbon, x 300. M                     | 9 Iron + 0.89% carbon, annealed at 900°<br>C., x 2,000. M               |
| 3 Iron + 0.16% carbon, x 300. M                     | 10 Iron + 1.3% carbon, as rolled, x 300. M                              |
| 4 Iron + 0.25% carbon, x 300. M                     | 11 Iron + 1.3% carbon, annealed, x 300. M                               |
| 5 Iron + 0.48% carbon, x 300. M                     | 12 Iron + 1.3% carbon, quenched in cold<br>water from 850° C., x 300. M |
| 6 Iron + 0.64% carbon, x 300. M                     |                                                                         |
| 7 Iron + 0.89% carbon, normal pearlite,<br>x 300. M |                                                                         |

All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section  
L.S.—Longitudinal Section.

**Section MM 11—Metallurgy—Continued.**

- |                                                                                                         |   |                                                                                  |   |
|---------------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------------------------|---|
| 13 Iron + 1.8% carbon, × 300.                                                                           | M | 23 Alloy, Tin 60%, silver 40%, × 250.                                            | M |
| 14 Iron + 1.5% carbon, quenched in water below freezing, from 1,250° C., × 1,800.                       | M | 24 Britannia metal, tin 90%, antimony 10% (cubes are Sn <sub>3</sub> Sb), × 300. | M |
| 15 Iron (martensitic structure), 0.25% iron heated to 1,100° C. one hour, and quenched in water, × 300. | M | 25 Pure gold, showing crystal junctions, × 200.                                  | M |
| 16 Sheet steel, cold rolled, 0.35% carbon, × 300.                                                       | M | 26 Glyco antifriction metal, × 300.                                              | M |
| 17 Unannealed steel casting, showing "strain," × 300.                                                   | M | 27 Phosphor copper, P. 9%, × 300.                                                | M |
| 18 Unannealed steel casting, showing "strain," × 300.                                                   | M | 28 Phosphor bronze, Cu. 91%, Sn. 8.9%, P. 0.1%, × 300.                           | M |
| 19 Annealed steel casting (same composition as Nos. 17 and 18), × 300.                                  | M | 29 Common brass, Cu. 64%, Zn. 38%, P. 6%, × 300.                                 | M |
| 20 Self-hard tool steel (C. 1.35%, Si. 0.40%, Mn. 1.40%, Cr. 3.40%, W. 7.60%), × 300.                   | M | 30 Silicon bronze, Cu. 97%, Si. 3%, × 300.                                       | M |
| 21 Experimental alloy, lead 80%, platinum 20%, × 300.                                                   | M |                                                                                  |   |
| 22 Experimental alloy, tin 80%, platinum 20%, × 300.                                                    | M |                                                                                  |   |

We can undertake the preparation of Special Alloys, and the etching and photographing of the same, or any portion of the work—e.g., photographs from customers' own samples. We also supply Grinding and Polishing Machines and special Microscopic and Photomicrographic Apparatus for Metallurgy.

**Section MM 12—EGYPT AND EGYPTOLOGY.**

**EGYPT.**

- 1 Pompey's Pillar.
- 2 Pompey's Pillar and Sphinx.
- 3 Entrance to Great Pyramid.
- 4 Rock Tombs and Belzoni's Pyramid, Gizeh.
- 5 Sphinx and Great Pyramid, Gizeh.
- 6 View at Luxor, Thebes.
- 7 Entrance to Great Temple, Luxor.
- 8 Portion of Great Temple, Luxor.
- 9 The Memnonium, Thebes, from Plain.
- 10 Memnonium, Thebes, outside Pillars and Great fallen Colossus.
- 11 Court of Shishak, Thebes.
- 12 Temple of Goornch, Thebes.
- 13 Court of Shishak, Thebes.
- 14 Valley of Tombs of Kings, Thebes.
- 15 Statues of Memnon, Plain of Thebes.
- 16 Cleopatra's Temple at Erment, nr. Thebes.
- 17 Portico of Temple, Dendera.
- 18 Sculptures from Outer Wall, Dendera.
- 19 Dendera.
- 20 View from Philæ, looking north.
- 21 The Colonnade, Philæ.
- 22 South end Island of Philæ.
- 23 Doum Palm and Ruined Mosque, Philæ.
- 24 View on Island of Philæ.
- 25 Pharaoh's Bed at Philæ.
- 26 Antiquities from Island of Biggeh, nr. Philæ.
- 27 Temple of Koum Ombo, Upper Egypt.
- 28 View of Girgeh, Upper Egypt.
- 29 Edfou, Upper Egypt, Great Pylon.

**NUBIA.**

- 20 Colossus and Sphinx at Wady Sabona.
- 31 Facade of Great Temple at Abou Simbel

- 32 Temple of Maharraka.
- 33 Portico of Temple of Geff Hossayn
- 34 Early morning at Wady Kardassy
- 35 Temple of Wady Kardassy.

**KARNAK.**

- 36 Hall of Columns.
- 37 Sculptured Gateway.
- 38 Granite Obelisk, Lotus Column
- 39 View from Granite Pylon.
- 40 Granite Pylon.
- 41 Temple Palace, Medinet Haboo.
- 42 Pylon Gateway, Medinet Haboo.

**EGYPTOLOGY.**

- From objects collected by Professor J. Flinders Petrie, F.R.S., and reproduced by permission of the Manchester Museum
- 43 Knemu Nekht, The Priest.
  - 44 Knemu Nekht, Coffin of.
  - 45 Nekht Aukh, In Official Dress.
  - 46 Nekht Aukh, In Private Dress
  - 47 Body Coffin.
  - 48 Painted Pottery Coffin, from Garole, XVIII. Dyn.
  - 49 Two Trays of Offerings and two Soul Houses of Type E.D.
  - 50 Soul House, Type L, with Chair in Upper Room.
  - 51 Soul House, with Woman Grinding Corn.
  - 52 Canopic Chest.
  - 53 Boat, Going Up Stream.
  - 54 Boat, Going Down Stream.
  - 55 Magnified Section of Papyrus, B.C. 250.

**Section MM 13—COTTON AND THE COTTON PLANT.**

A series of Slides, principally photographs and photomicrographs, showing Cotton Fields and preparation before shipment; native methods of weaving, etc.; also the structure of the Cotton Plant and some of its diseases. A few Drawings, marked "D," are also included.

Plain Slides 1/3 each. Coloured, where suitable, 3/- each.

- |                                          |   |                                                       |
|------------------------------------------|---|-------------------------------------------------------|
| 1 Cotton planter and fertiliser.         | D | 8 Cotton boll or pod (ripe), burst open.              |
| 2 Cultivator, with stalk cutter.         | D | 9 Cotton seeds, with cotton attached.                 |
| 3 Cotton field, sown in furrows (India). |   | 10 Cotton field, with pickers at work (U.S.A.).       |
| 4 Young cotton plants.                   |   | 11 Cotton field, with pickers at work (U.S.A.).       |
| 5 Cotton plant in full flower.           |   | 12 Pickers waiting for cotton to be weighed (U.S.A.). |
| 6 Cotton plant in fruit.                 |   |                                                       |
| 7 Cotton plant in fruit (Orleans).       |   |                                                       |

Carrying Boxes, with Rubber Packing and Leather Handles—See Cover.

**Section MM 13—Cotton and the Cotton Plant—Continued.**

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| <p>13 Weighing cotton (U.S.A.)<br/>                 14 Loading cotton in the field (U.S.A.)<br/>                 15 Hauling cotton from the field (U.S.A.)<br/>                 16 Cotton Baling Press.<br/>                 17 River tramp loading cotton at ginnery (U.S.A.)<br/>                 18 River tramp taking cotton to seaport (U.S.A.)<br/>                 19 Native girl ginning cotton with Churka (India).<br/>                 20 Native girl ginning cotton with Churka (India); shows also Native Huts.<br/>                 21 Ginning cotton at Government Experimental Farm (India).<br/>                 22 Baling press and weighing box (India).<br/>                 23 Oxen taking cotton to market from country gin.<br/>                 24 Gaharry taking ginned cotton to market (India).<br/>                 25 Indian spinners at work.<br/>                 26 Parsee ladies weaving sacred thread (India).<br/>                 27 Primitive method of weaving (India).<br/>                 28 Cotton mill in erection (India).</p> <p><b>STRUCTURE OF THE COTTON PLANT AND COTTON FIBRES.</b><br/>                 A series of Photomicrographs.<br/>                 34 Root, transverse section.</p> | <p>D</p> <p>35 Stem, transverse section.<br/>                 36 Flower bud, transverse section.<br/>                 37 Ovary, transverse section.<br/>                 38 Seed and embryo, transverse section.<br/>                 39 Part of seed, T.S., showing outer coats and endosperm.<br/>                 40 Cotton fibres to show twisting.<br/>                 41 Cotton fibres, in transverse section.<br/>                 42 Egyptian cotton, entire fibres.<br/>                 43 Egyptian cotton, T.S.<br/>                 44 American (Florida) cotton, entire fibres.<br/>                 45 American (Florida) cotton, T.S., fibres.<br/>                 46 Mercerised cotton, entire.<br/>                 47 Cotton and wool fibres, entire.<br/>                 48 Cotton and wool fibres, T.S.<br/>                 49 Viscose, artificial silk, entire fibres.</p> <p><b>DISEASES OF THE COTTON PLANT.</b></p> <p>61 Root rot. D<br/>                 62 Leaf mildew. D<br/>                 63 Stalk borer. D<br/>                 64 Boll disease, Anthracnose. D<br/>                 65 Boll moth, Metamorphosis. D<br/>                 66 Boll moth, parasite. D<br/>                 67 Boll weevil. D<br/>                 68 Seed fungus. P</p> |
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**Section MM 14—COTTON IN VARIOUS STAGES OF SPINNING.**

A new series of photographs, including examples of typical Yarns of the usual counts; also some Defective Yarns.

Plain Slides, 1/3 each.

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 Typical Cotton Staples, 10 varieties.<br/>                 2 Typical Cotton Staples, 10 other varieties. P<br/>                 3 Sliver from Drawing Frame, parallel fibres.<br/>                 4 Action of "Licker-in."<br/>                 5 Web from Revolving Carding Engine for 32's T.<br/>                 6 Sliver for 32's T.<br/>                 7 Web from Revolving Carding Engine for 60's T.<br/>                 8 Sliver for 60's T.<br/>                 9 Web from Flat Carding Engine for 100's T.<br/>                 10 Sliver for 100's T.</p> <p><b>TYPICAL YARNS.</b><br/> <b>Twist Yarns.</b></p> <p>16 Twist Yarn, 20's.<br/>                 17 Twist Yarns, 32's.<br/>                 18 Twist Yarn, 40's.<br/>                 19 Twist Yarn, 60's, Brown Egyptian.<br/>                 20 Twist Yarn, 70's.<br/>                 21 Twist Yarn, 80's.</p> | <p>22 Twist Yarn, 90's.<br/>                 23 Twist Yarn, 100's<br/>                 24 Twist Yarn, 150's<br/>                 25 Twist Yarn, 200's.<br/>                 26 Twist Yarn, 300's.</p> <p><b>Wet Yarns.</b></p> <p>32 Weft Yarn, 4's<br/>                 33 Weft Yarn, 10's.<br/>                 34 Weft Yarn, 20's.<br/>                 35 Weft Yarn, 30's.<br/>                 36 Weft Yarn, 40's.<br/>                 37 Weft Yarn, 50's.</p> <p><b>Defective Yarns.</b></p> <p>38 Hank Rovings, 125's Counts.<br/>                 39 Defective Yarn, typical "crackers."<br/>                 40 Defective Yarn, abnormal "crackers."<br/>                 41 Defective Yarn, 32's, irregular<br/>                 42 Defective Yarn, "corkscrewed."<br/>                 43 Defective Yarn, "snarls."</p> |
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**Section MM 15—COTTON SPINNING,**  
 including the Evolution of Cotton Machinery.

Plain Slides only, 1/3 each.

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 Indian Bow for separating Cotton from Seed.<br/>                 2 Foot Roller Gin.<br/>                 3 Churka Gin.<br/>                 4 Brakell's Patent Knife Roller Gin.<br/>                 5 Double Knife Roller Gin.<br/>                 6 Single Macarthy Gin.<br/>                 7 Double Macarthy Gin.<br/>                 8 Double Macarthy Gin, Section.<br/>                 9 Saw Gin, Cross Section.<br/>                 10 Steam Ginnery Press.<br/>                 11 Section of Modern Ginnery.<br/>                 12 Section of Bale Breaker.</p> | <p>13 Pedal Bale Breaker, Section.<br/>                 14 Porcupine Bale Breaker, Section<br/>                 15 Asa Lee's Hopper Bale Breaker.<br/>                 16 Brooks and Doxey's Hopper Bale Breaker.<br/>                 17 Simplex Automatic Hopper Feeder.<br/>                 18 Dohson and Barlow's Bale Breaker.<br/>                 19 Bale Breaker with four lines of Rollers.<br/>                 20 Porcupine Feed Tube and Dust Trunks.<br/>                 21 Arrangement of Bale Breaker and Mixing Lattice, Section.<br/>                 22 Arrangement of Bale Breaker and Mixing Lattice, Plan.</p> |
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All Slides may be had **Plain**—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section  
 L.S.—Longitudinal Section.

Section MM 15—Cotton Spinning—Continued.

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| <p>23 Arrangement of Mixing Room, Stockport Ring Spinning Co.<br/>                 24 Oldham Willow, side view.<br/>                 25 Oldham Willow, end view.<br/>                 26 Crighton's Cotton Opener.<br/>                 27 Backley's Single Opener.<br/>                 28 Hetherington's Opener, general view.<br/>                 29 Howard and Bullough's Opener, general view.<br/>                 30 Double Scutcher, with lap attached, general view.<br/>                 31 Lord's Scutcher and Feed Regulator.<br/>                 32 Lord's Opener and Scutcher with pneumatic Tubes.<br/>                 33 Lord's Conical Horizontal Beater Opener.<br/>                 34 Combined Opener and Scutcher with Vertical Beater (Elevation).<br/>                 35 Combined Opener and Scutcher with Vertical Beater, plan.<br/>                 36 Crighton Single Beater, Finisher Lap Machine.<br/>                 37 Brooks and Doxey's Single Beater Scutcher.<br/>                 38 Plan of Gearing of Single Scutcher.<br/>                 39 Elevation of Gearing of Scutcher.<br/>                 40 Scutcher, adjustable Dust Bins.<br/>                 41 Piano Feed Regulator for Scutcher.<br/>                 42 Section, Feed part of Scutcher. Cotton struck from pedal nose.<br/>                 43 Regulating motion of Opener and Scutcher.<br/>                 44 Paul's Carding Engine (No. 1).<br/>                 45 Paul's Carding Engine (No. 2).<br/>                 46 Lewis Paul's and Arkwright's Spinning and carding machines, 1749-1769.<br/>                 47 Fisher's Carding Engine and Drawing Frame, 1835.<br/>                 48 Arkwright's Complete Carding Engine.<br/>                 49 Bourn's Carding Engine.<br/>                 50 Guest's Old Card.<br/>                 51 Bennett's and Tatham's Feed Rollers.<br/>                 52 Bayley and Quarzby's Carding Engine.<br/>                 53 Faulkner's Carding Engine.<br/>                 54 Pooley's Patent Card.<br/>                 55 Roller and Clearer Card (Section).<br/>                 56 Breaker Carding Engine.<br/>                 57 Connected Card, Plan and Elevation.<br/>                 58 Wilkinson's Carding Engine.<br/>                 59 Smith's Self Stripping Carding Engine.<br/>                 60 Buchanan's Self Stripping Carding Engine.<br/>                 61 Leigh's Self Stripping Carding Engine.<br/>                 62 Leigh's Self Stripping Revolving Flat Card.<br/>                 63 Finisher Card altered to Leigh's Self Stripper.<br/>                 64 Revolving Flat Card, Section.<br/>                 65 Revolving Flat Card, Plan.<br/>                 66 Brooks and Doxey's Revolving Flat Card.<br/>                 67 Wellman's Breaker Card, general view.<br/>                 68 Wellman's Self Stripping Card.<br/>                 69 Hetherington's Card, with 16 Iron Flats.<br/>                 70 Union Card, Parr, Curtiss, and Co.<br/>                 71 Card Cloth.<br/>                 72 Single Roller Carding Engine (Section).<br/>                 73 Double Roller Carding Engine (Section).<br/>                 74 Carding Engine with Mason Bend.<br/>                 75 Railway Drawing Frame.<br/>                 76 Brooks and Doxey's Drawing Frame, general view.<br/>                 77 Brooks and Doxey's Drawing Frame, Section.<br/>                 78 Gearing for Drawing Frame.<br/>                 79 Drawing Frame, Stop Motion.</p> | <p>80 Drawing Frame, Full Can Stop Motion.<br/>                 81 Drawing Frame, method of Weight relief.<br/>                 82 Drawing Frame, Clearers for top rollers and Combers.<br/>                 83 Interior of Mill, Carding and Drawing.<br/>                 84 Nasmith's Patent Comber.<br/>                 85 Nasmith's Patent Comber, another view.<br/>                 86 Nasmith's Patent Comber, another view.<br/>                 87 Hellmann's Combing Machine (Section).<br/>                 88 Imb's Combing Machine (Section).<br/>                 89 Duplex Comber.<br/>                 90 Comber and Nipper Cam (Section).<br/>                 91 Comber, Notch and wheel feed motion.<br/>                 92 Fly Frame, Section.<br/>                 93 Raynor's Frame, 1813, End Elevation.<br/>                 94 Raynor's Frame, 1813, Front Elevation.<br/>                 95 Water Frame, front view.<br/>                 96 Water Frame, Section.<br/>                 97 Fly Frame, Gearing Plan.<br/>                 98 Fly Frame, Method of Driving Spindle and Bobbins.<br/>                 99 Fly Frame, Building or Traverse Motion.<br/>                 100 Fly Frame, Reversing Motion.<br/>                 101 Brooks and Doxey's Slubbing Frame.<br/>                 102 Tatham and Cheetham's Can Slubbing Frame, Elevation.<br/>                 103 Tatham and Cheetham's Can Slubbing Frame, Plan.<br/>                 104 Brooks and Doxey's Roving Frame, general view.<br/>                 105 Brooks and Doxey's Intermediate Frame, nearer view.<br/>                 106 Distaff and Spindle.<br/>                 107 Arkwright's Roving Frame.<br/>                 108 Old Lantern Frame.<br/>                 109 Spinning Wheel.<br/>                 110 Indian Spinners at work.<br/>                 111 Hargreave's Spinning Jenny.<br/>                 112 Arkwright's First Spinning Machine.<br/>                 113 Bobbin Winding Wheel.<br/>                 114 High's Jenny.<br/>                 115 Paul's Spinning Machine, 1753<br/>                 116 Finishing Lap Machine.<br/>                 117 Crompton's Mule.<br/>                 118 Robert's Self Acting Mule, Elevation &amp; Plan.<br/>                 119 Robert's Mule, three views<br/>                 120 Guest's Mule.<br/>                 121 Smith's Self Acting Mule, Elevation &amp; Plan.<br/>                 122 Curtiss Parr &amp; Madley's Self Acting Mule.<br/>                 123 McGregor's Self Acting Mule.<br/>                 124 Rhodes' Triangular Mule, general view.<br/>                 125 Rhodes' Triangular Mule, Front Elevation.<br/>                 126 Rhodes' Triangular Mule, Side Elevation.<br/>                 127 Hetherington's Mule, general view.<br/>                 128 Hetherington's Mule, back view.<br/>                 129 Brown and Powell's Throstle.<br/>                 130 Shaw and Cottam's Patent Throstle.<br/>                 131 Howard and Bullough's Twist Spinning Ring Frame.<br/>                 132 Brooks and Doxey's Ring Spinning Frame.<br/>                 133 Evan Leigh's Putting-up Motion.<br/>                 134 Ring with Excentric Liver, with Pin &amp; Gauge.<br/>                 135 Bernhard's Bobbin.<br/>                 136 Hall's 'th'-Wood (Crompton's Birthplace).<br/>                 137 Samuel Crompton.<br/>                 138 Sir Richard Arkwright.<br/>                 139 J. and P. Coats' Model Mill, Paisley.</p> |
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Slides Toned to an Artistic Brown Shade cost 6d. each, or 4/6 per dozen extra.

For Terms for  
 Making Slides to Order  
 see page 5.

**Section MM 16—COTTON WEAVING MACHINERY.**

For the arrangement of these slides and for several of the drawings we are indebted to H. Nisbet, Esq., M. Text. Inst., author of "Preliminary Operations of Weaving."

Plain Slides only, 1/3 each.

*These Slides cannot be hired.*

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| <p>1 Holt's Cop or Bobbin Winder, end elevations and part plan.<br/>                 2 Hattersley's Three-cone Pirn Winder<br/>                 3 Twist Winding Frame: Sections.<br/>                 4 Drum Winding.<br/>                 5 Pirn Winder, with scroll traverse.<br/>                 6 Hacking's Disc Winder: Front view.<br/>                 7 Hacking's Disc Winder: End view, traverse.<br/>                 8 Hacking's Disc Winder: 2 sectional views.<br/>                 9 Hacking's Twist Winding from Cops: Mangle-wheel.<br/>                 10 Hall's Winding from Throstle Bobbins: Mangle-wheel.<br/>                 11 Stubb's Warping Mill<br/>                 12 Hall's Winding-in Machine.<br/>                 13 Bethel's Sectional Warper: End view.<br/>                 14 Thos. Holt, Ltd., Cross Balling or spooling Machine.<br/>                 15 Hitchon's Self-stopping Measuring Motion.<br/>                 16 Asa Lee's Beam Warping Machine: End elevation and Plan.<br/>                 17 Rossiter Stop Motion: Beam warper, end view with details.<br/>                 18 Beam Warper: Falling rods, end view with details.<br/>                 19 Beam Warper: Brimelow's stop-motion, front view.<br/>                 20 Singleton Beam Warper, stop motion, end view.<br/>                 21 Dickinson &amp; Sons' Slasher or Tape-sizing Machine<br/>                 22 Ball Warp Tension, Beaming Machine.<br/>                 23 Hall's Ball Warp Press, Beaming Machine.<br/>                 24 Slasher Sizing Machine, Winding End Plan.</p> | <p>25 Slasher Sizing Machine, Creel end and part of cylinder elevations.<br/>                 26 Felber's Slasher Sizing Machine: Winding end and part of cylinder elevations.<br/>                 27 Slasher Sizing Machine: Creel and Plan.<br/>                 28 Slasher Sizing Machine: Detail of cylinder sectional view.<br/>                 29 Dickinson and Sons' Scotch Dressing or Sizing Machine.<br/>                 30 Size Mixing Plants.<br/>                 31 Clay Boiling Vat, Mixing Vat, Coil Sizer-boiler and feed.<br/>                 32 Mather and Platt's Ball Warp Sizing Machine.<br/>                 33 Ball Sizing: Section<br/>                 34 Ball Sizing: Drying Cylinders.<br/>                 35 Hall's Double Hank-sizing Machine.<br/>                 36 Hall's Hank-sizing Machine.<br/>                 37 Hank-sizing and Brushing Machine.<br/>                 38 Tattersall and Holdsworth, Horizontal Air Drying Slasher Sizing Machine.<br/>                 39 Hattersley's Yorkshire Warp Dressing Frame.<br/>                 40 Holroyd's Warp Winding Machine.<br/>                 41 Ainley and Hollingworth's Horizontal Warping Mill.<br/>                 42 Warp Easing Motion for Looms.<br/>                 43 Gauze Reed: Enlarged detail.<br/>                 44 Cross or Leno Weaving<br/>                 45 Leno Machine, mounted.<br/>                 46 Jacquard Cross-border, end view of Frame.<br/>                 47 McMurdo's Jacquard, Card-repeating Machine.<br/>                 48 Devoe's Jacquard, Leno Machine.<br/>                 49 Jacquard Cross-border Section, details of cylinder Motion and Connections.<br/>                 50 Long Chain Pirning Machine.</p> |
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**SERIES OF SLIDES NOT NOW DETAILED IN CATALOGUE:—**

*FULL LIST OF THESE SLIDES ON APPLICATION.*

**Section MM 17—FIBRE YIELDING PLANTS.**

A series of 20 Slides from Drawings. Plain only, 1/- each.

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A series of 40 Slides, mostly Photomicrographs. Plain only, 1/- each.

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A series of 36 Slides—Photographs of Cocoons of various Silk Moths, Photomicrographs of Fibres and Machinery. Plain Slides only, 1/3 each.

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**P**—Photograph. **D**—Drawing or Diagram. **M**—Photomicrograph. **T.S.**—Transverse Section  
**L.S.**—Longitudinal Section.



**Section MM 20—TOWN PLANNING.**

Reproduced by permission from "Site Planning in Practice," by F. Longstreth Thompson, B.Sc. (16/-, 1923).

Plain Slides only, 1/6 each.

- 1 Aberdare, Cwmneol Housing Scheme, plan.
- 2 Aberdare, Cwmneol Housing Scheme, section.
- 3 Amersham, Houses grouped on hilltop, general view.
- 4 Amersham, Houses grouped on hilltop, near view.
- 5 Building Block, rectangular.
- 6 Building Block, triangular.
- 7 Building Block, trapezoidal.
- 8 Building Block, segmental.
- 9 Civic Centre, Abercarn, Treowen Scheme.
- 10 Civic Centre, Liverpool, Walton-Clubmoor.
- 11 Civic Centre, Llay Village.
- 12 Civic Centre, Newburn-on-Tyne, Throckley.
- 13 Civic Centre, Tremadoc, plan.
- 14 Civic Centre, Tremadoc, general view.
- 15 Civic Centre, Tremadoc, near view.
- 16 Civic Survey, York, Distribution of different kinds of buildings.
- 17 Civic Survey, York, Distribution of different types of residential districts.
- 18 Civic Survey, York, Distribution of different open spaces and allotments.
- 19 Civic Survey, York, Communications.
- 20 Civic Survey, York, Time-zone diagram.
- 21 Civic Survey, York, Position of housing sites.
- 22 Cul-De-Sac, Hurry Port, photograph.
- 23 Cul-De-Sac, Chesterfield, Halfway Eckington.
- 24 Cul-De-Sac, Folkestone, plan.
- 25 Cul-De-Sac, Folkestone, entrance.
- 26 Cul-De-Sac, Folkestone, way through houses.
- 27 Cul-De-Sac, Hatfield, plan.
- 28 Cul-De-Sac, Hatfield, photograph.
- 29 Cul-De-Sac, Oulton, plan.
- 30 Cul-De-Sac, Symmetry of, spoilt by levels.
- 31 Density Diagram, Twelve houses to the acre.
- 32 Density Diagram, Twenty houses to the acre.
- 33 Dormanstown, Aerial view.
- 34 Drainage Filter trenches for rural cottages.
- 35 Drainage, Sectional and separate, diagram.
- 36 Drainage, Sectional and separate, diagram.
- 37 Subdivision of Garden, diagram.
- 38 Broad High Street, Amersham.
- 39 Broad High Street, Tenterden.
- 40 House Grouping, at road junction, diagram.
- 41 House Grouping, at road junction, diagram.
- 42 House Grouping, at turning place in road, photograph.
- 43 House Grouping, reflected in forecourts, diagram.
- 44 Kerb and Channel, combined form.
- 45 Lay-out Plan, Abercarn, Lan Fach.
- 46 Lay-out Plan, Abercarn, Treowen.
- 47 Lay-out Plan, Barry Garden Suburb.
- 48 Lay-out Plan, Bellingham.
- 49 Lay-out Plan, Brighton, Moulescombe Estate.
- 50 Lay-out Plan, Burry Port Garden Suburb.
- 51 Lay-out Plan, Chesterfield, Highfield Hall Scheme.
- 52 Lay-out Plan, Dartford.
- 53 Lay-out Plan, Dormanstown.
- 54 Lay-out Plan, Dover.
- 55 Lay-out Plan, Glasgow, Moss Park.
- 56 Lay-out Plan, Glasgow, Shettleston and Tolleross.
- 57 Lay-out Plan, Jordans Village.
- 58 Lay-out Plan, Killestre.
- 59 Lay-out Plan, Leeds, Hawksworth Wood Scheme.
- 60 Lay-out Plan, Lemington-on-Tyne.
- 61 Lay-out Plan, Liverpool, Larkhill.
- 62 Lay-out Plan, Liverpool, Springwood-Allerton.
- 63 Lay-out Plan, Walton-Clubmoor.
- 64 Lay-out Plan, Llay village.
- 65 Lay-out Plan, Newburn-on-Tyne, Throckley Scheme.
- 66 Lay-out Plan, Newcastle-on-Tyne, Walker Estate.
- 67 Lay-out Plan, Nottingham, Sherwood Estate.
- 68 Lay-out Plan, Portsmouth, Portsdown Hill Scheme.
- 69 Lay-out Plan, Roehampton.
- 70 Lay-out Plan, Sheffield, Manor Estate.
- 71 Lay-out Plan, Sheffield, Stubbins Estate.
- 72 Lay-out Plan, Swanpool.
- 73 Lay-out Plan, Temple-Newsam.
- 74 Lay-out Plan, Wakedield, Thornes Park.
- 75 Lay-out Plan, Walton-upon-Thames.
- 76 Leeds, Distribution of housing sites.
- 77 Leeds, Position of Middleton Scheme relative to city.
- 78 Letchworth, Diagrammatic plan.
- 79 Liverpool, Distribution of housing sites.
- 80 Market Place, Alfriston.
- 81 Market Place, Amersham.
- 82 Market Place, Bungay.
- 83 Newark-on-Trent, Position of scheme in relation to town.
- 84 Norbury, House Grouping, plan.
- 85 Norbury, House Grouping, photograph.
- 86 Open Spaces, Occupation of road frontage, diagram 1.
- 87 Open Spaces, Occupation of road frontage, diagram 2.
- 88 Open Spaces, Occupation of road frontage, diagram 3.
- 89 Recreation Ground, plan.
- 90 Road Bay, Brighton, Moulescombe.
- 91 Road Bay, Old Oak Common.
- 92 Road Bay, Sheffield, Walkley Hall.
- 93 Road Bay, White Hart Lane.
- 94 Road Bay, White Hart Lane.
- 95 Road Frontage, Causes of loss, diagram.
- 96 Road Frontage, Loss at corners, diagram.
- 97 Arrangement of Houses at Road Junctions, Built-up corner.
- 98 Arrangement of Houses at Road Junctions, Feeling of breadth at.
- 99 Arrangement of Houses at Road Junctions, Semi-built-up corner.
- 100 Arrangement of Houses at Road Junctions, Typical treatment of right-angled corner.
- 101 Arrangement of Houses at Road Junctions, Typical treatment of right-angled corner.
- 102 Arrangement of Houses at Road Junctions, Typical treatment of right-angled corner.
- 103 Cross sections of Arterial roads.
- 104 Cross-sections of Boulevards.
- 105 Cross-sections of Residential roads.
- 106 Cross-sections of roads on hilly sites.
- 107 Cross-sections of Secondary Roads.
- 108 Roads at Right Angles to Contours, Folkestone.
- 109 Roads at Right Angles to Contours, Hatfield.
- 110 Roads at Right Angles to Contours, Norbury.

Carrying Boxes, with Rubber Packing and Leather Handles—See Cover.

**Section MM 20—Town Planning—Continued.**

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| <p>111 Roads at Right Angles to Contours, Rye.<br/>                 112 Roads Diagonal to Contours, treatment of.<br/>                 113 Roads Parallel to Contours.<br/>                 114 Roehampton, House Grouping, plan.<br/>                 115 Roehampton, House Grouping, photograph.<br/>                 116 Roehampton, House Grouping, photograph.<br/>                 117 Rye, General View.<br/>                 118 Secondary Access to Houses, 1. Back roads.<br/>                 119 Secondary Access to Houses, 2. Duplicated back roads.<br/>                 120 Secondary Access to Houses, 3. Back foot-paths.<br/>                 121 Secondary Access to Houses, 4. Tunnels through houses.<br/>                 122 Secondary Access to Houses, 5. Paved recesses for coal.<br/>                 123 Secondary Access to Houses, 6. Grouped coal and ash stores.</p> | <p>124 Secondary Access to Houses, 7. Service roads.<br/>                 125 Secondary Access to Houses 8. Arrangement suggested by S. P. Taylor.<br/>                 126 Set-Back of Houses, Bury Port.<br/>                 127 Set-Back of Houses, Leeds, Wyther House.<br/>                 128 Set-Back of Houses, Roehampton.<br/>                 129 Tees-Side—South, Industrial areas and housing sites.<br/>                 130 Vienna, Diagrammatic plan.<br/>                 131 Village Green, Goudhurst, Kent<br/>                 132 Village Green, Newark-on-Trent.<br/>                 133 Village Green, Penn, Bucks.<br/>                 134 Village Green, Winchelsea.<br/>                 135 Welwyn, Diagrammatic plan.<br/>                 136 Welwyn, Handside Lane.</p> |
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**Section MM 21—BRIDGES, ANCIENT AND MODERN.**

A series of 50 illustrations of Bridges, showing the progress of bridge-building from ancient times to the present day. Of pictorial and scientific interest.

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See also Geological Views, Section GE6.

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| <p>1 Adel Church, Norman Porch.<br/>                 2 Adel Church, Door and Sanctuary Knockers.<br/>                 3 Appleton-le-Street. Saxon Church.<br/>                 4 Beauchief Abbey, West Front.<br/>                 5 Bolton Abbey, West Front.<br/>                 6 Bolton Abbey, Doorway from Choir.<br/>                 7 Bolton Abbey, Doorway from East.<br/>                 8 Bolton Abbey, West Front and Doorway.<br/>                 9 Bolton Abbey, from South.<br/>                 10 Bolton Abbey, from South West.<br/>                 11 Bolton Abbey, from South East.<br/>                 12 Bolton Abbey, Stepping Stones, from East.<br/>                 13 Bolton Abbey, Bolton Hall.<br/>                 14 Byland Abbey, Coxwold, from South.<br/>                 15 Byland Abbey, Coxwold, from East<br/>                 16 Byland Abbey, West Doorway.<br/>                 17 Byland Abbey, from the Gateway.<br/>                 18 Barnsley, Cross and Fountain at Cawthorne.<br/>                 19 Conisboro Castle, 2 views.<br/>                 20 Conisboro Castle, Staircase.<br/>                 21 Easby Abbey, from North.<br/>                 22 Edstone, Saxon Sundial.<br/>                 23 Fountains Abbey, general view.<br/>                 24 Fountains Abbey, general view, reflection.<br/>                 25 Fountains Abbey, from South, reflection.<br/>                 26 Fountains Abbey, from South, nearer view.<br/>                 27 Fountains Abbey, West Front.<br/>                 28 Fountains Abbey, from North.<br/>                 29 Fountains Abbey, Interior Nave, looking East<br/>                 30 Fountains Abbey, West Doorway.<br/>                 31 Fountains Abbey, Choir, looking East.<br/>                 32 Fountains Abbey, Exterior of Chapter House.<br/>                 33 Fountains Abbey, Cloisters, interior.<br/>                 34 Fountains Abbey, West Front, cellularium.<br/>                 35 Helmsley, Old Market Cross.<br/>                 36 Helmsley, Base of socket of old cross used as landmark.</p> | <p>37 Helmsley, Castle Gateway, 2 views.<br/>                 38 Jervaulx Abbey, general view.<br/>                 39 Jervaulx Abbey, normal doorway.<br/>                 40 Kirkham Abbey, distant view.<br/>                 41 Kirkham Abbey, interior.<br/>                 42 Kirkham Abbey, Gateway from East.<br/>                 43 Kirkham Abbey, Gateway from West.<br/>                 44 Kirkham Abbey, Gateway, near view.<br/>                 45 Kirkham Abbey, Norman doorway.<br/>                 46 Kirkham Abbey, Channel from North.<br/>                 47 Kirkdale Church, sundial.<br/>                 48 Kirkdale, old cross in wall of church.<br/>                 49 Kirkstall Abbey, Nave interior.<br/>                 50 Kirkstall Abbey, Cloisters.<br/>                 51 Kirkstall Abbey, West Front.<br/>                 52 Kirkstall Abbey, West Front, near view.<br/>                 53 Lastingham Church, Crypt.<br/>                 54 Malton Priory Church, Norman doorway.<br/>                 55 Middleton Church, Pickering, ancient portion of Saxon tower.<br/>                 56 Mount Grace Priory.<br/>                 57 Mount Grace Priory, from N.E.<br/>                 58 Mount Grace Priory, from S.E.<br/>                 59 Mount Grace Priory, from South.<br/>                 60 Pickering Castle, Dungeon.<br/>                 61 Pickering Castle, Gateway.<br/>                 62 Pickering Castle, The Keep.<br/>                 63 Pickering Castle, Milne Tower.<br/>                 64 Pickering Castle, Rosamond's Tower.<br/>                 65 Pickering Castle, Devil's Tower.<br/>                 66 Pickering Church, Porch.<br/>                 67 Rievaulx Abbey, general view.<br/>                 68 Rievaulx Abbey, general view, N.E.<br/>                 69 Rievaulx Abbey, exterior from S.<br/>                 70 Rievaulx Abbey, exterior from S.E.<br/>                 71 Rievaulx Abbey, Transept.<br/>                 72 Rievaulx Abbey, Transept, near view.</p> |
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All Slides may be had Plain—unless otherwise stated.

P—Photograph. D—Drawing or Diagram. M—Photomicrograph. T.S.—Transverse Section  
 L.S.—Longitudinal Section.

Section SS 3—Yorkshire—Continued.

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|--------------------------------------------|---------------------------------------------------------|
| 73 Rievaulx Abbey, Choir.                  | 95 Tickhill Church, House built 1570.                   |
| 74 Rievaulx Abbey, Choir, looking E.       | 96 Whitby Abbey general view.                           |
| 75 Rievaulx Abbey, Choir, looking W.       | 97 Whitby Abbey, another view.                          |
| 76 Rievaulx Abbey, Refectory.              | 98 Whitby Abbey, from Nave, looking S.                  |
| 77 Rievaulx Abbey, front of Refectory.     | 99 Whitby Abbey, Nave.                                  |
| 78 Rievaulx Abbey, doorway of Refectory.   | 100 Whitby Abbey, the Abbey Church seen through window. |
| 79 Rievaulx Abbey, Temple terrace (right). | 101 Whitby Abbey, Ceadmon's Cross                       |
| 80 Roche Abbey, from N.                    | 102 York, Walmgate Bar, with Barbican.                  |
| 81 Roche Abbey, from S.                    | 103 York, Roman Coffins, Museum Gardens.                |
| 82 Roche Abbey, from W.                    | 104 York, Norman Doorway, S. Margaret's.                |
| 83 Salton Church, Interior.                | 105 York, Holy Trinity, E. Window (1470).               |
| 84 Salton Church, Norman doorway.          | 106 York, Bootnam Bar.                                  |
| 85 Scarborough Castle.                     | 107 York, Micklegate Bar.                               |
| 86 Scarborough Castle, doorway.            | 108 York, Monkbar.                                      |
| 87 Selby Abbey, West Front, before fire.   | 109 York, Norman doorway, S. Denis Church.              |
| 88 Selby Abbey, Doorway, before fire.      | 110 York Minster and City, from Walls.                  |
| 89 Sinnington Church, now demolished.      | 111 York Minster, doorway, W. Front.                    |
| 90 Skipton Castle, Gateway.                | 112 York Minster, Exterior.                             |
| 91 Snainton Church, Norman Porch.          | 113 York, Holy Trinity Church.                          |
| 92 Tickhill Castle, from S.                | 114 York, S. Mary's Abbey, S.E.                         |
| 93 Tickhill Castle, from N.                | 115 York, S. Mary's Abbey, another view.                |
| 94 Tickhill Church, Porch.                 |                                                         |

Section SS 10—ENGLISH LAKE DISTRICT.

Plain Slides 1/3 each. Coloured 2/6 each.

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|-------------------------------------------------------------|----------------------------------------------------|
| 1 Furness Abbey, general view.                              | 42 Little Langdale, Slater's Bridge.               |
| 2 Furness Abbey, Chapter House.                             | 43 Ilugmoor Fell from Little Langdale.             |
| 3 Furness Abbey, Sedilia                                    | 44 R. Brathay from Ford, Little Langdale.          |
| 4 Windermere Lake from Bowness.                             | 45 Skelwith Bridge.                                |
| 5 Bowness Bay, Windermere Lake.                             | 46 Skelwith Force.                                 |
| 6 Waterhead, Head of Windermere Lake.                       | 47 Glen below Skelwith Force.                      |
| 7 Sunset on Windermere Lake.                                | 48 Colwith Force.                                  |
| 8 Moonlight on Windermere Lake.                             | 49 Head of Coniston Lake.                          |
| 9 Cattle at Waterhead, Windermere.                          | 50 Gondola on Coniston Lake.                       |
| 10 Loughrigg and Clappergate, from L. Windermere.           | 51 Coniston and Old Man from Pier.                 |
| 11 Ambleside, River Rothy and Bridge.                       | 52 Coniston Village and Old Man                    |
| 12 Ambleside, Market Place.                                 | 53 Coniston Church.                                |
| 13 Ambleside, Old Mill.                                     | 54 Ruskin's Monument, Coniston Churchyard.         |
| 14 Ambleside, Church.                                       | 55 Yewdale Valley from Coniston.                   |
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- 36 Red Deer, Stag.

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- 38 Grey Squirrel.
- 39 Otter, on rock, feeding.
- 40 Otters, pair of.
- 41 Otter, leaving water.
- 42 Common Seal, on rock.

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(See page 37.)

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- 42 Dictydium cancellatum.
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- 50 Slime Fungus, "Flowers of Tan."
- 51 Cordyceps on *Peronea* pupa.
- 52 Fungi on dead Oak.
- 53 Fungi on dead Birch.

### INSECTS, &c.

- 51 *H. defoliaria*, male, amongst Oak Leaves.
- 52 *C. fluctuata* on Birch.
- 53 *Trigonaspis crustalis*, Galls on Oak.

For Terms for Hiring  
Slides see page 4.

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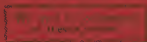
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