

**ELEMENTARY MICROSCOPICAL
TECHNOLOGY: A MANUAL FOR
STUDENTS OF MICROSCOPY. IN THREE
PARTS. PART I. THE TECHNICAL HISTORY
OF A SLIDE. FROM THE CRUDE
MATERIALS TO THE FINISHED MOUNT**

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Elementary Microscopical Technology: A Manual for Students of Microscopy. In Three Parts.
Part I. The Technical History of a Slide. From the Crude Materials to the Finished Mount by
Frank L. James

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IN THREE PARTS.

PART I.

THE TECHNICAL HISTORY OF A SLIDE

FROM THE CRUDE MATERIALS TO THE FINISHED MOUNT.

BY

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PREFACE.

IN all existing text-books of microscopical technology with which I am acquainted, not only in the English, but in the French, German and Italian tongues, the technology proper—or the manipulations and processes incident to the preparation of material for microscopical examination, is so mixed up with the micrography—histological, pathological or biological, that it is an almost hopeless task for the student, especially the beginner, working without a master, to separate them. In the multitude of details and the interruptions to continuity caused by the attempt at teaching simultaneously such widely divergent subjects, the elementary student fails to grasp a clear idea of either the one or the other.

Another difficulty, incident to and inseparable from instruction attempted to be conveyed in this manner, is that the author must, at many points anticipate details or presuppose some acquaintance with the subject on the part of the student.

Realizing these difficulties, first as a student remote from skilled teachers, slowly working out by experiment each problem as it arose, and afterwards as a teacher, searching for a text-book to put into the hands of my students, I finally undertook the preparation of a manual modelled after an ideal in which nothing should be taken for granted, no previous acquaintance, on the part of the student, with the subject-matter presupposed, and in which

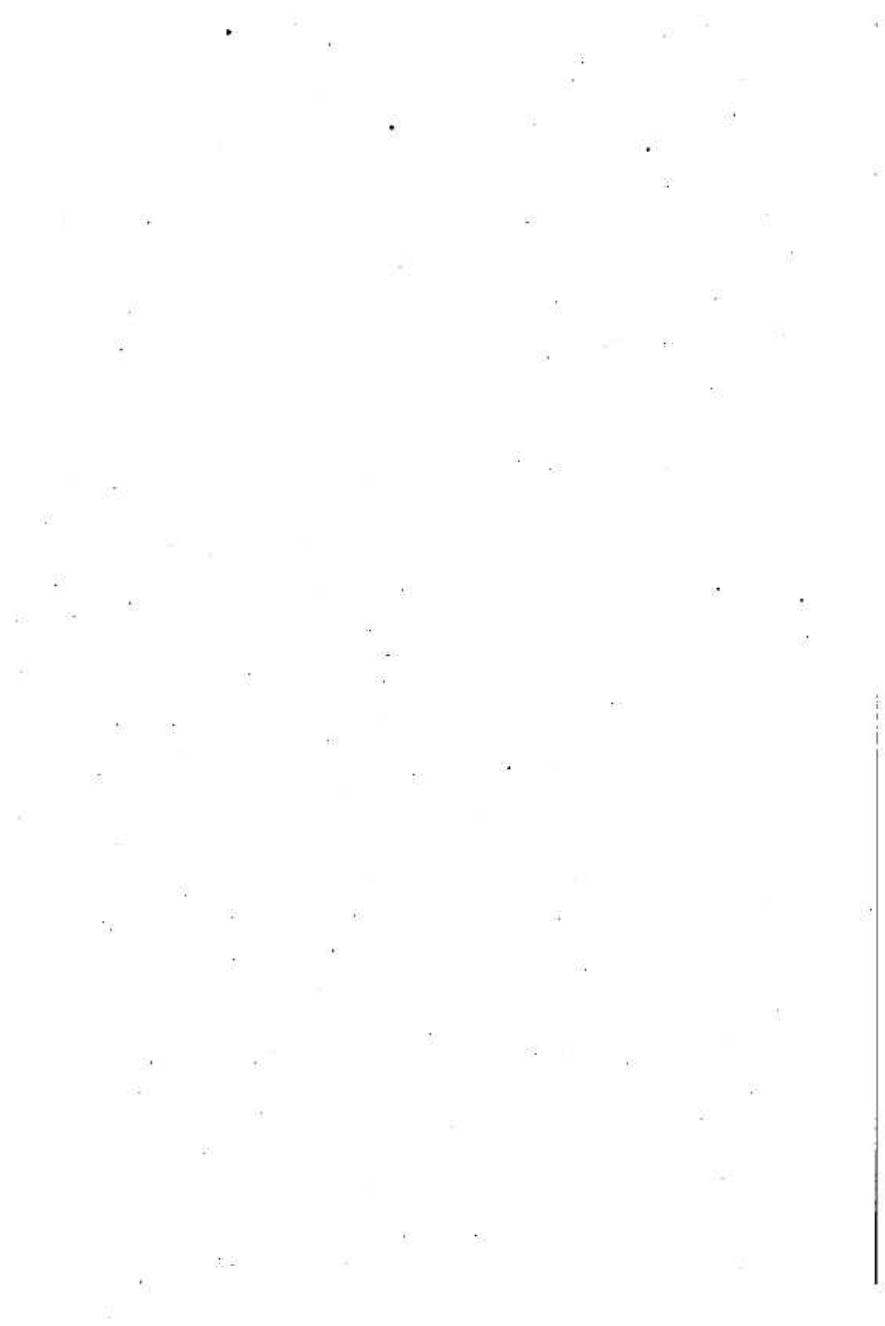
each step of the work, each process and manipulation should be explained in orderly sequence.

This little manual is the result of this idea ; how well I have succeeded in its execution is for the reader to say. I will only add that I have endeavored to make it strictly practical, having embodied in it the actual experiences of many years of almost incessant labor in this direction.

The present volume is devoted entirely to Elementary Technology, and details the Technical History of a Slide from the crude materials up to the finished mount. It constitutes Part I of a work on General Microscopical Technology constructed upon the same scheme and plan, the other parts of which will appear in due time.

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The following table shows the results of the experiment. The first column is the number of trials, the second column is the number of correct responses, and the third column is the percentage of correct responses. The data shows that the percentage of correct responses increases as the number of trials increases, indicating that the subjects are learning the task.

Trial	Correct	Percentage
1	0	0%
2	1	50%
3	1	50%
4	2	100%
5	2	100%
6	3	150%
7	3	150%
8	4	200%
9	4	200%
10	5	250%
11	5	250%
12	6	300%
13	6	300%
14	7	350%
15	7	350%
16	8	400%
17	8	400%
18	9	450%
19	9	450%
20	10	500%
21	10	500%
22	11	550%
23	11	550%
24	12	600%
25	12	600%
26	13	650%
27	13	650%
28	14	700%
29	14	700%
30	15	750%
31	15	750%
32	16	800%
33	16	800%
34	17	850%
35	17	850%
36	18	900%
37	18	900%
38	19	950%
39	19	950%
40	20	1000%
41	20	1000%
42	21	1050%
43	21	1050%
44	22	1100%
45	22	1100%
46	23	1150%
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48	24	1200%
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75	37	1850%
76	38	1900%
77	38	1900%
78	39	1950%
79	39	1950%
80	40	2000%
81	40	2000%
82	41	2050%
83	41	2050%
84	42	2100%
85	42	2100%
86	43	2150%
87	43	2150%
88	44	2200%
89	44	2200%
90	45	2250%
91	45	2250%
92	46	2300%
93	46	2300%
94	47	2350%
95	47	2350%
96	48	2400%
97	48	2400%
98	49	2450%
99	49	2450%
100	50	2500%

ELEMENTARY MICROSCOPICAL TECHNOLOGY.

I.

Microscopical technology is a description of those processes and appliances by means of which objects are prepared for examination under the microscope and permanently preserved for future reference and study. In microscopy, as in every other pursuit which involves the use of tools or instruments, the number and nature of the apparatus and appliances deemed necessary for the performance of good work will vary very greatly according to the taste, ingenuity, and above all, the pecuniary ability of the individual. While some men will be content and do good work with a few simple instruments, costing but a few dollars, others will require the most elaborate outfit, costing as many hundreds. In the present series of articles I shall describe only those instruments which experience has taught me to be absolutely essential, leaving the student to learn from more elaborate textbooks and the catalogues of the instrument makers, those more complicated appliances which, while they are frequently of great assistance, are not absolutely essential in doing good work and hence must be considered as *articles de luxe*.

§ I. The processes through which an object passes from its crude or natural condition up to the finished slide, ready for the cabinet, vary according to the nature of the material. They may be grouped under six general headings, viz;

- a. Preserving in the mass.
- b. Hardening those substances which are too soft, and softening those which are too hard to be cut with the section knife.
- c. Embedding.
- d. Section cutting.
- e. Staining.
- f. Mounting on slips.

Some objects have to pass through all of these processes,