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A Bibliography of Electron Microscopy. III

COMPILED BY

CLAIRE MARTON
Division of Electron Optics, Stanford University, Stanford University, California

AND

SAMUEL SASS*
In Charge of Physics and Observatory Libraries, University of Michigan, Ann Arbor, Michigan

THE interest evidenced in the first two parts of our bibliography published in this journal[1] seemed to warrant the present effort to bring it up to date so far as is possible under existing conditions. As in the earlier parts, the material is arranged in eight groups; within each group the arrangement is chronological and within each year alphabetical by author and title. No papers came to our attention which would fall into Group VI (Electron Speeds Above 100 kv).

In the April, 1944, issue of *Kolloid Zeitschrift* (**107**, 2–16), E. Ruska published a paper summarizing the development and applications of the electron microscope in Germany up to the end of 1943. This paper includes a summary in table form of the types of electron microscopes, the application of each type, and the number of papers about each type published in Germany up to the end of 1943. The compilers thought it would be of interest to publish a translation of this table and, for purposes of comparison, to construct a similar table showing the number of papers published in countries exclusive of Germany during the same period. Table I is the translation of Ruska's table and Table II gives the same information concerning papers published outside of Germany.

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I. BOOKS

1941

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Schmieder, F. *Examples of the application of the electron microscope to chemical-technical problems.* Das Übermikroskop als Forschungsmittel, 67. Berlin, 1941.

1943

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1944

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1945

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* Now at General Electric Laboratory, Pittsfield, Massachusetts.

[1] J. App. Phys. **14**, 522–531 (1943); **15**, 575–579 (1944).

II. EMISSION MICROSCOPY

1942

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III. TRANSMISSION TYPE MICROSCOPE

1944

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IV. OPTICS OF THE TRANSMISSION TYPE ELECTRON MICROSCOPE

1940

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1942

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1943

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V. IMAGE DEFECTS

1940

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1944

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VII. DIFFERENT RELATED INSTRUMENTS

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1942

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1943

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VIII. APPLICATIONS OF THE TRANSMISSION TYPE MICROSCOPE

1939

Ruska, H. Electron microscopical research technique. *Naturwiss.* **27**, 287–292 (1939).

1940

Borries, B. von and Ruska, E. The influence of electron interference on the image of crystals in the electron microscope. *Naturwiss.* **28**, 366 (1940).

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TABLE I.

Means of image formation	Transmission	Vertical illumination	Emission
Enlarging lenses (focusing microscopes)	Most important instrument for many applications m.l. e.l. EM 1931 EM 1933 SM 1933 SM 1939 2 mμ 8 mμ 341 papers	Instrument for metallographic investigations m.l. e.l. EM 1933 ——— SM 1940 ——— 25 mμ 6 papers	Instrument for metallographic and cathode investigations m.l. e.l. EM 1932 EM 1931 SM 1942 SM 1942 140 mμ 40 mμ 5 papers
Point projection (shadow microscope, field emission microscope)	Resolution limited by distortion m.l. e.l. EM —— EM —— SM —— SM 1939 25 mμ 5 papers		Special instrument for the investigation of finest points m.l. e.l. EM —— EM —— SM —— SM 1937 4 mμ 7 papers
Scanning (scanning microscope)	Resolution limited by scanning lines m.l. e.l. EM —— EM —— SM 1938 SM —— 40 mμ 2 papers	Imaging system possible, no microscopical devices known up to now	

Abbreviations: m.l. =magnetic lens, e.l. =electrostatic lens, EM =electron microscope, SM =super microscope.

TABLE II.

Means of image formation	Transmission	Vertical illumination	Emission
Enlarging lenses (focusing microscopes)	Most important instruments for many applications m.l. e.l. 2 mμ 10 mμ 180 papers	Instrument for metallographic investigations m.l. e.l. ——— ——— ———	Instrument for metallographic and cathode investigations m.l. e.l. 1 μ? ——— 13 papers
Point projection (shadow microscope, field emission microscope)	Resolution limited by distortion m.l. e.l. ——— 50 mμ? 1 paper		Special instrument for the investigation of finest points and of fine wires m.l. e.l. 1 μ for wires 4 mμ for points 3 papers
Scanning (scanning microscopes)	Resolution limited by scanning lines m.l. e.l. ——— ——— ———	m.l. e.l. 50 mμ 1 paper	———

Abbreviations: m.l. =magnetic lens, e.l. =electrostatic lens, EM =electron microscope, SM =super microscope.