

## ***Stereo Microscope***

***Part 4: Wrap-up (Appendices Only)  
3rd Edition***

***R. Jordan Kreindler (USA)***



**Figure 73. Femur and tibia with 'spikes' of a common moth seen through Zeiss Greenough stereo microscope**

## *Appendices*

Zeiss has been a leader in many areas of stereo microscopy, from the first Greenough stereo microscope in 1897, the first corneal microscope (which also included the first sliding changeable objective sets) c. 1899, the first CMO c. 1938, the first high ratio zoom stereo microscope c. 1975, etc.

[Author's Note: In the late 1800s almost 15% of all Germans were dying of tuberculosis. So, shortly after 1890, when German Scientist Robert Koch announced his discovery of tuberculin as a cure for tuberculosis, Zeiss' annual sales of microscopes rose dramatically to about 2,200 per year. However, it was shown relatively quickly that tuberculin was not a cure for tuberculosis (the invalid claims regarding the abilities of tuberculin is sometimes referred to as the "tuberculin scandal"). In the aftermath, Zeiss' annual sales for all microscopes declined to, probably, less than 1,700/year in 1897, the year Zeiss introduced the first Greenough stereo microscope (Auerback, 1904). In spite of the "tuberculin scandal", Koch received a Nobel Prize in 1905, three years after Dr. Ross received his Nobel Prize in Medicine (Kreindler and Goren, 2011). Koch wrote to Carl Zeiss saying, "A large part of my success I owe to your excellent microscopes" - reported in (Zeiss, 1996).]

Appendices A and B show, respectively, some of Zeiss' model designations, including East and West German production and a, hopefully, comprehensive list of Zeiss stereo microscope models. Both lists are works in progress, and the author welcomes any suggestions for improvements or additions.

Appendix B "List of Zeiss Stereo Microscopes" is missing some definitive entries. There are still unknowns due, for example, to some ambiguity in the dates for manufacture of some Zeiss microscopes owing to minor disparities between internal Zeiss documents. For example, where FY was used it can be difficult, or impossible, to identify a calendar year. I've included a column for development location but not one for location of manufacture. Some later Zeiss microscopes were manufactured outside Germany, and some of these locations are not publically available.

The development of both Appendices would have been considerably more difficult, if not impossible, without help from many, including Zeiss USA and Germany (Orlowski and Zölfel, 2012), Mr. Larry Gubas, USA (Gubas, 2012), Mr. Fritz Schultze, Canada (Schulze, 2011, 2012), and auction sites selling Zeiss instruments.

However, the author's greatest thanks go to Herr Berndt Joachim Lau, Carl Zeiss Microscopy GmbH, Germany (Lau, 2012). Herr Lau was kind enough to provide the information for Appendix A. For Appendix B, he checked the author's early entries for completeness and accuracy, and made numerous adjustments as necessary. However, the presentation and content of both these tables is the sole responsibility of the author.

*[Author's note: Major manufacturers or distributors of stereo microscopes, who would like appendices of similar information for their stereo microscopes included in a later edition of this paper, may contact the author at the email provided below.]*

# Stereo Microscopy

## *Appendix A. Zeiss Stereo Microscopes, Model Designation Identifiers*

| <b>Carl Zeiss Oberkochen and Newer Zeiss Models</b>  |  |  |  |
|--|--|--|--|
| <b>First Position</b>  | <b>Second Position</b>   | <b>After Letters</b>   | <b>Last Position</b>   |
| S (stereo), i.e. CMO   | V (vario), i.e., Zoom<br>R (revolving feature), i.e. Galilean magnifier drum   | Zoom factor<br>Revolving factor  | <i>Note: Photo capability NOT indicated for CMOs</i>   |
| D (double), i.e., Greenough  | V (vario), i.e., Zoom<br>R (revolving feature), can mean<br>(1) Objective pairs turret, e.g. DR1040, or<br>(2) Objective pairs can be changed, e.g., DRC | Zoom factor<br>Revolving factor, or<br>Magnification details<br><br>May not be present | C (Camera port on Greenough), can mean<br>(1) Integrated trinocular, e.g., Stemi 2000-C, or<br>(2) An optional camera port, e.g., DRC<br><br><i>S (Image in one channel split)<br/>Used only with the Stemi 2000-CS where the splitting<br/>of the right channel is permanent - A special case only.</i> |
| <b>Carl Zeiss Jena or Rathenow</b>   |  |  |  |
| <b><i>Only used with Zeiss GSZ and GSM Microscopes. - Applies to these models only. *</i></b>    |  |  |  |
| G (Greenough)  | S (Stereo) i.e., Greenough   |  | Z (Zoom)<br>M (microscope)   |
| <i>*This is a special case only for GSZ and GSM microscopes.</i>                                 |  |  |  |
| It is included here to eliminate possible confusion should GSM and/or GSZ models be encountered. |  |  |  |

## Appendix B. Zeiss Stereo Microscope Models

### Zeiss Stereo Microscopes

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| <u>Start</u> | <u>Stop</u> | <u>Designation</u>  | <u>Development Location</u> | <u>Style</u> | <u>Notes</u>   |
|--------------|-------------|---|-----------------------------|--------------|--|
|              |             |   |                             |              | obj. = objective, w =with, std. = standard,<br>orig. = original, aux. = auxiliary, config. = configuration |
| 1897         | Unk         | First Greenough<br>Double microscope of Zeiss Design<br>Corneal Microscope (Hornhaut-<br>Mikroskop) | Jena                        | Greenough    | 25x, 40x eyepieces, One obj. pair  |
| 1898         | Unk         |   | Jena                        | Greenough    | First use of exchangeable obj. pairs on slider   |
| <1902        | Unk         | Advanced Greenough  | Jena                        | Greenough    | 8-72x w exchangeable optics, 5 objective pairs on slider,<br>4 eyepiece pairs, 3 stands                    |
| <1902        | >1939       | Stereoscopic camera<br>an alternative for double tube   | Jena                        | Greenough    |  |
| < 1919       | Unk         | Binocular Microscope w Porro Prisms   | Goettingen                  | Greenough    | 8-105x w exchangeable optics, 2 stands, 4 objs. on slider  |
| < 1923       | 1942        | Double tube X with various stands   | Jena                        | Greenough    | Single obj. pair 2-12x on slider or Triple turret obj. pairs<br>on slider; > 10 Stands                     |
| 1926         | 1942        | Double tube XV w obj. turret assembly   | Jena                        | Greenough    | With std. quad. turret, objs. 2x, 4x, 8x, 12x;<br>std. config. 8x eyepieces (730 microscopes made)         |
| < 1937       | > 1946      | Double tube XII   | Jena                        | Greenough    | 4-32x w exchangeable objs., 10 stands  |

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|  |           |   |            |           |  |
|--|-----------|---|------------|-----------|--|
| 1938-1941  | See below | Citoplast (See below)   | Jena       | CMO       | Zeiss Annual Report 1940/41 FY (Feb 04, 1942, Archive No. 17100 - Citoplast, 816 RM);<br>Ready first years WW II, launch delayed by government |
| 1946   | 1955 est. | Praeparier -Mikroskop Citoplast (commercial launch)           | Jena       | CMO       | 2.5-63x w exchangeable optics (Annual Report Aug 10, 1946, Archive No. 17116)  |
| < 1949   | > 1953    | PM XVI (Praeparier-Mikroskop)                                 | Jena       | Greenough | 0.4x, 1x, 2.5x obj. pairs on slider  |
| <b><i>1948 East German Company name changed to VEB Carl Zeiss Jena</i></b> |           |   |            |           |  |
| <b><i>1954 West German Company name changed to Carl Zeiss</i></b>          |           |   |            |           |  |
| 1949   | 1959      | "Opton", 1st stereo w glossy black finish                     | Oberkochen | CMO       | Five steps 6x, 10x, 16x, 25x, 40x; 10x eyepieces, optional 2x front lens, "Opton" and later just "Zeiss" branded                               |
| 1955   | Unk       | SM XX (Not SM 20)   | Jena       | CMO       | orig. black finish, later changed to off-white/light-gray  |
| 1959   | 1964      | Stereomicroscope II and II POL                                | Oberkochen | CMO       | Five steps 6x, 10x, 16x, 25x, 40x; 10x eyepieces, grey finish  |
| 1961   | 1976      | Stereomicroscope I  | Oberkochen | Greenough | 0.63-10x, w 7 obj. sets  |
| 1962   | 1973      | Stereo Magnifier 01<br>Stereolupe 01/later Stereomikroskop 01 | Oberkochen | Greenough | Single 0.63x obj. pair   |
| 1962   | 1975      | Stereo Magnifier 02<br>Stereolupe 01/later Stereomikroskop 01 | Oberkochen | Greenough | Single 2x obj. pair  |
| 1964   | 1976      | Stereomicroscope III  | Oberkochen | Greenough | 1-4x Objective magnification, 4x, 10x, 25x eyepieces   |
| 1968   | 1973-     | IV  | Oberkochen | CMO       | 0.8-4x, pancratic obj. zoom, 10x, 25x eyepieces  |

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|         |       |  |            |           |  |
|---------|-------|--|------------|-----------|--|
| 1973    | 1979  | I/b  | Oberkochen | Greenough | 2-4-8x stepwise knob changer, 4x, 10x, 16x, 25x eyepieces  |
| 1973    | 1985  | IV/b   | Oberkochen | CMO       | 0.8-5x zoom; 4x, 10x, 16x, 25x eyepieces<br>0.5x, 2x aux. lenses                                       |
| 1975    | 1982  | Technival  | Rathenow   | CMO       | Successor to the SM XX; 10x, 25x eyepieces<br>0.5x, 2x aux. lenses                                     |
| 1975    | 1982  | Citoval  | Rathenow   | CMO       | 1st 10:1 stereo zoom; 0.5x, 2x aux. lenses<br>std. 10-100x range, w aux. lenses 5-200x                 |
| 1976    | 1991  | DV4 (Grey Version)   | Oberkochen | Greenough | 1-4x Zoom 8x-32x std.<br>3.6-64.0x w exchangeable optics, 4x, 10x, 16x,<br>25x eyepieces, 2x aux. lens |
| 1977    | 1996  | D (1990 color change from grey to white)                             | Oberkochen | Greenough | Single magnification; 4x, 10x, 16x, 25x eyepieces<br>0.5x, 2x aux. lenses                              |
| 1977    | 1988  | DR   | Oberkochen | Greenough | 0.9 - 8x Single magnification; turret on slider capable<br>4x, 10x, 16x, 25x eyepieces                 |
| 1978    | 1997  | DRC (DR w camera/photo port)<br>1990 color change from grey to white | Oberkochen | Greenough | 0.9 - 8x Single magnification; turret on slider capable<br>4x, 10x, 16x, 25x eyepieces                 |
| 1979    | 1991  | SR   | Oberkochen | CMO       | Five Step 1-6.3x; 10x, 16x, 25x eyepieces  |
| 1982    | 1991  | SV8  | Oberkochen | CMO       | 1-8x, Zoom   |
| c 1982  | 1990  | Technival 2  | Rathenow   | CMO       | Magnifications 0.63x-5.0x; 10x, 16x, 25x eyepieces<br>Four versions of Technival 2: 2, 2f, 2-M, 2f-M   |
| c 1982  | 1990  | Citoval 2  | Rathenow   | CMO       | Magnifications 0.63x-5.0x; 10x, 16x, 25x eyepieces<br>Four versions of Citoval 2: 2, 2f, 2-M, 2f-M     |
| c. 1984 | >1990 | GSM  | Rathenow   | Greenough | 0.8x-6.3x exchangeable obj. pairs, not zoom  |

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|         |         |  |            |           |   |
|---------|---------|--|------------|-----------|---|
| c. 1984 | >1992   | GSZ                                    | Rathenow   | Greenough | 6.3x, 10x, (for eyeglasses) 12.5x, 16x, 20x eyepieces<br>5x-25x zoom; 6.3x, 10x, 12.5x, 16x, 20x eyepieces,<br>especially for GSZ 0.5x, 2x aux. lenses  |
| 1991    | 2004    | SV11                                   | Oberkochen | CMO       | Zoom w or w/o click stops<br>0.8x, 1x, 1.2x, 1.6x, 2x, 2.5x, 3.2x, 4x, 5x, 6.6x Click stops   |
| 1991    | 2005    | SV6                                    | Oberkochen | CMO       | Zoom w or w/o click stops<br>0.6x, 0.8x, 1x, 1.2x, 2x, 2.5x, 3.2x, 4x, 5x Click stops   |
| 1993    | Present | Stemi 2000 + Stemi 2000-C              | Jena       | Greenough | 1.95x-32.5x w aux. lenses<br>0.3x, 0.4x, 0.63x, 1.2x, 1.6x, 2.0x; 10x, 16x, 25x eyepieces   |
| 1994    | 2004    | SV11 APO                               | Oberkochen | CMO       | 0.6-6.6x Zoom, 6.0-264x w exchangeable optics   |
| 1995    | 1997    | Stemi 1000                             | Jena       | Greenough | 0.7-3.5x Zoom, 2.1-175x w exchangeable optics   |
| 1997    | Present | Stemi 2000-CS                          | Jena       | CMO       | 1.0-7.7x Zoom, 3.3-385x w exchangeable optics   |
| 2000    | 2011    | DV4 in stand C (Blue-white version)    | Jena       | Greenough | <u>Double-lens-Vario</u><br>8x-32x Zoom; Fixed 10x eyepieces, exchangeable optics   |
| 2000    | Present | DV4 SPOT (Blue-white version)          | Jena       | Greenough | <u>Double-lens-Vario</u> , 8x-32x Zoom, exchangeable optics<br>Fixed 10x eyepieces, Fiber-optic cold light SPOT<br>supplementary lenses include a 0.3-0.5x zoom lens w<br>WD of 234-91mm, often used w boom stand |
| 2001    | 2003    | DR1040 in stand C (Blue-white version) | Jena       | Greenough | <u>Double-lens-Revolving</u><br>Fixed magnifications 10x, 40x   |
| 2001    | 2003    | DR1663 in stand C (Blue-white version) | Jena       | Greenough | <u>Double-lens-Revolving</u> , Fixed magnifications 16x, 32x  |
| 2004    | Present | SteREO Discovery.V12                   | Jena       | CMO       | 0.8-10x motorized zoom; 10x, 16x, 25x eyepieces<br>exchangeable optics  |



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|      |         |                                      |            |           |   |
|------|---------|--------------------------------------|------------|-----------|---|
| 2004 | Present | SteREO Lumar.V12                     | Jena       | CMO       | 0.8-10x motorized zoom, 6.4-240x, independent excitation zoom<br>fluorescence, exchangeable objs.<br>10x, 16x, 25x eyepieces                              |
| 2006 | Present | SteREO Discovery.V8                  | Jena       | CMO       | 1.0-8x manual zoom, 10x, 16x, 25x eyepieces<br>exchangeable objs.   |
| 2007 | Present | SteREO Discovery.V20                 | Goettingen | CMO       | 0.75-15x motorized zoom; 10x, 16x, 25x eyepieces<br>exchangeable objs.; R&D team moved from Jena in 2005  |
| 2011 | Present | DV4 compact stand C LED (Blue-white) | Goettingen | Greenough | <u>Double-lens-Vario</u> , mag. 8-32x, integrated objs,<br>supplementary lenses include a 0.3-0.5x zoom lens w<br>WD of 234-91mm, often used w boom stand |

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*(This list includes references/notes for the full paper. However, additional references may be added in later Parts)*

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