

Aesthetics of Hand-Drawn and Computer-Generated Illustrations

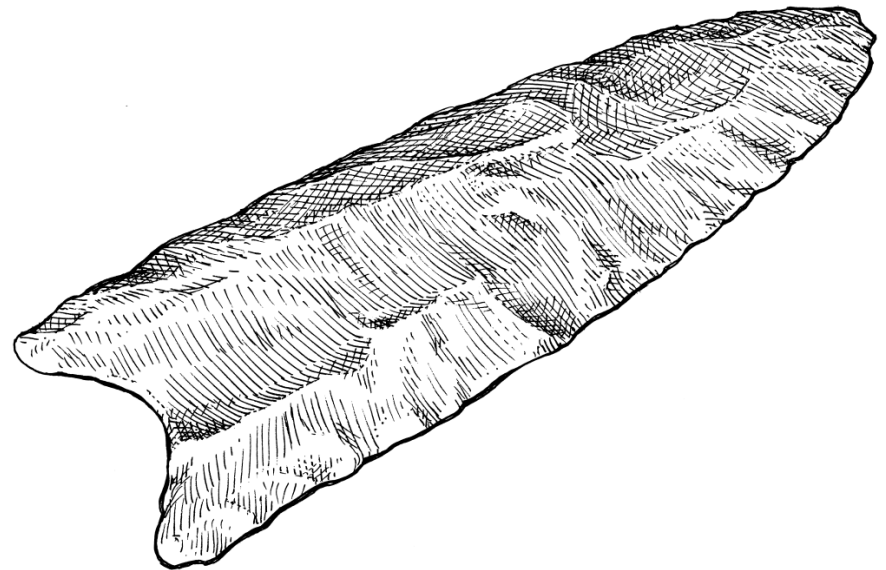
Tobias Isenberg

Petra Neumann

Sheelagh Carpendale

Mario Costa Sousa

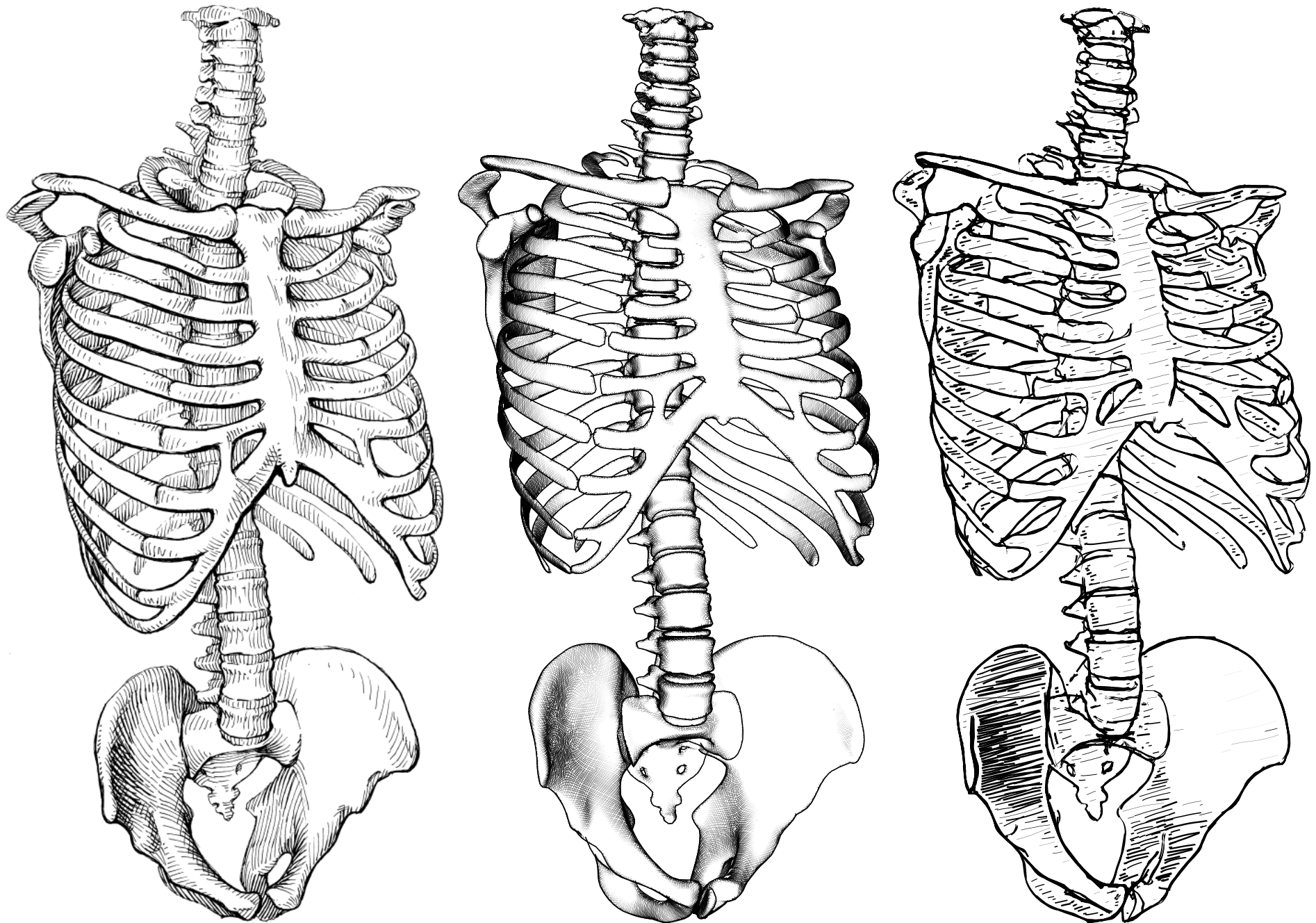
Joaquim A. Jorge



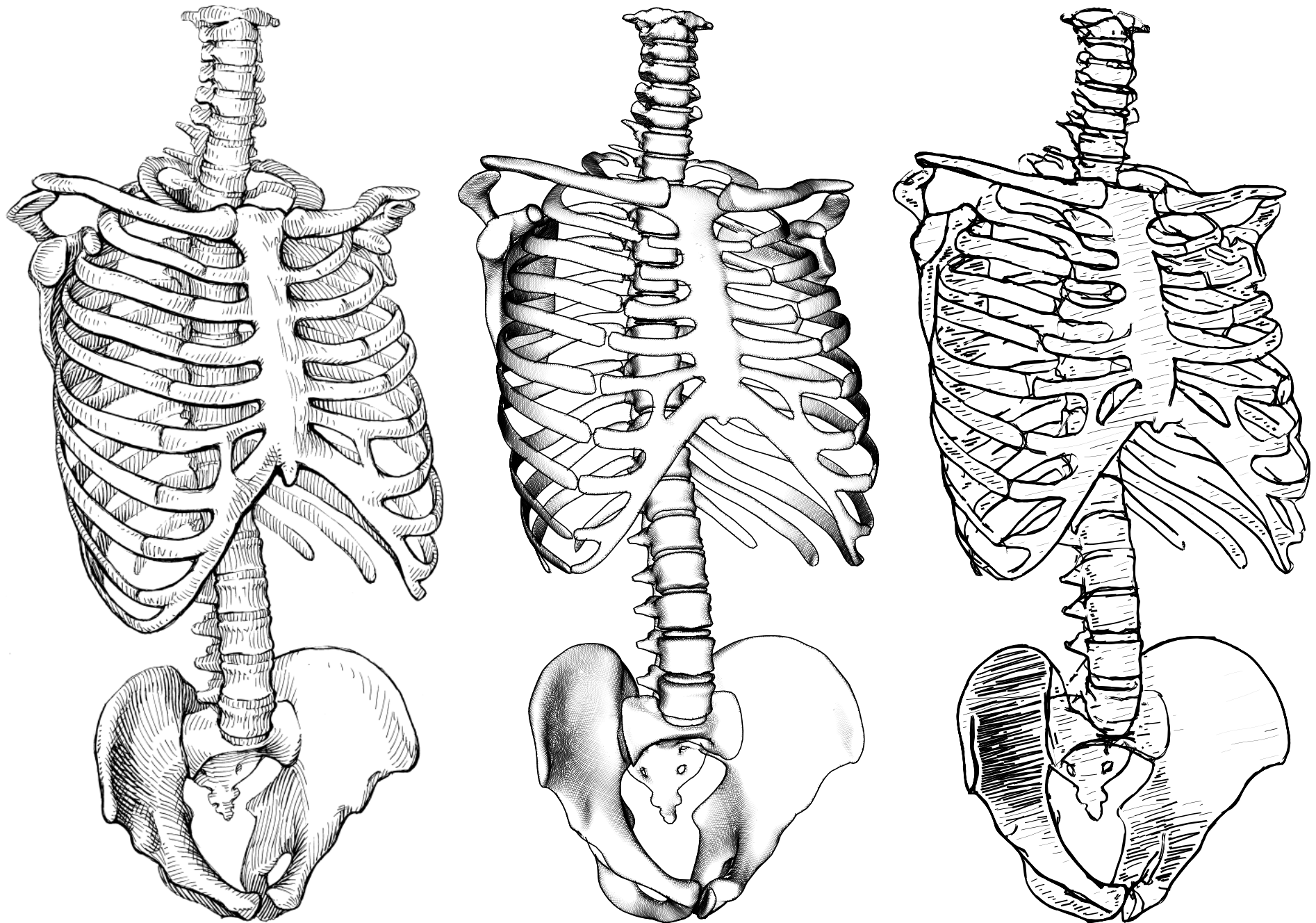
Department of Computer Science
Faculty of Science
University of Calgary



Which of these images do you like?

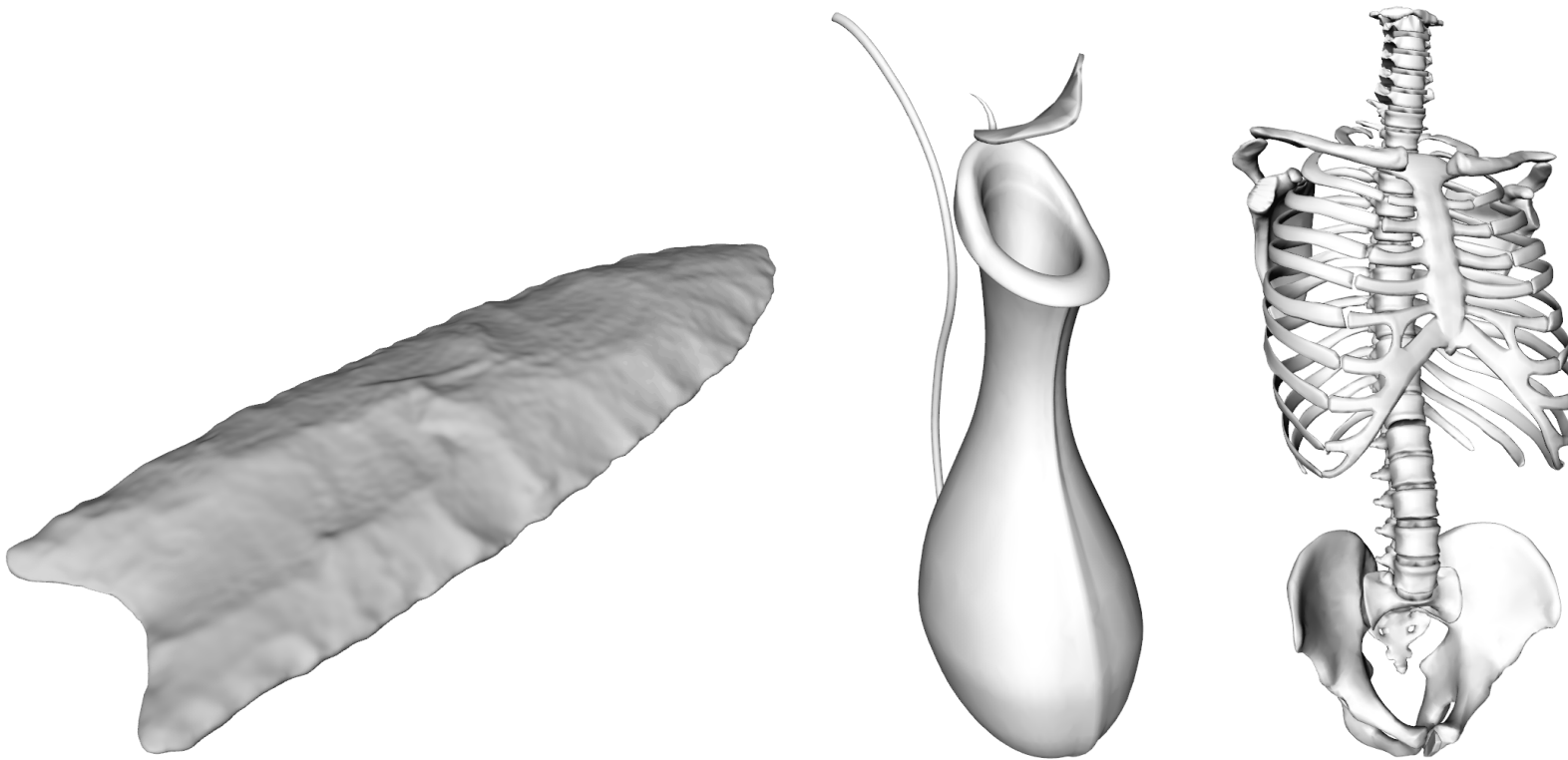


Hand-drawn or computer-generated?



Study Setup: Images

- 30 images of 3 “models” generated:
archaeological, botanical, and medical model



- 5 professional illustrators and 5 NPR algorithms

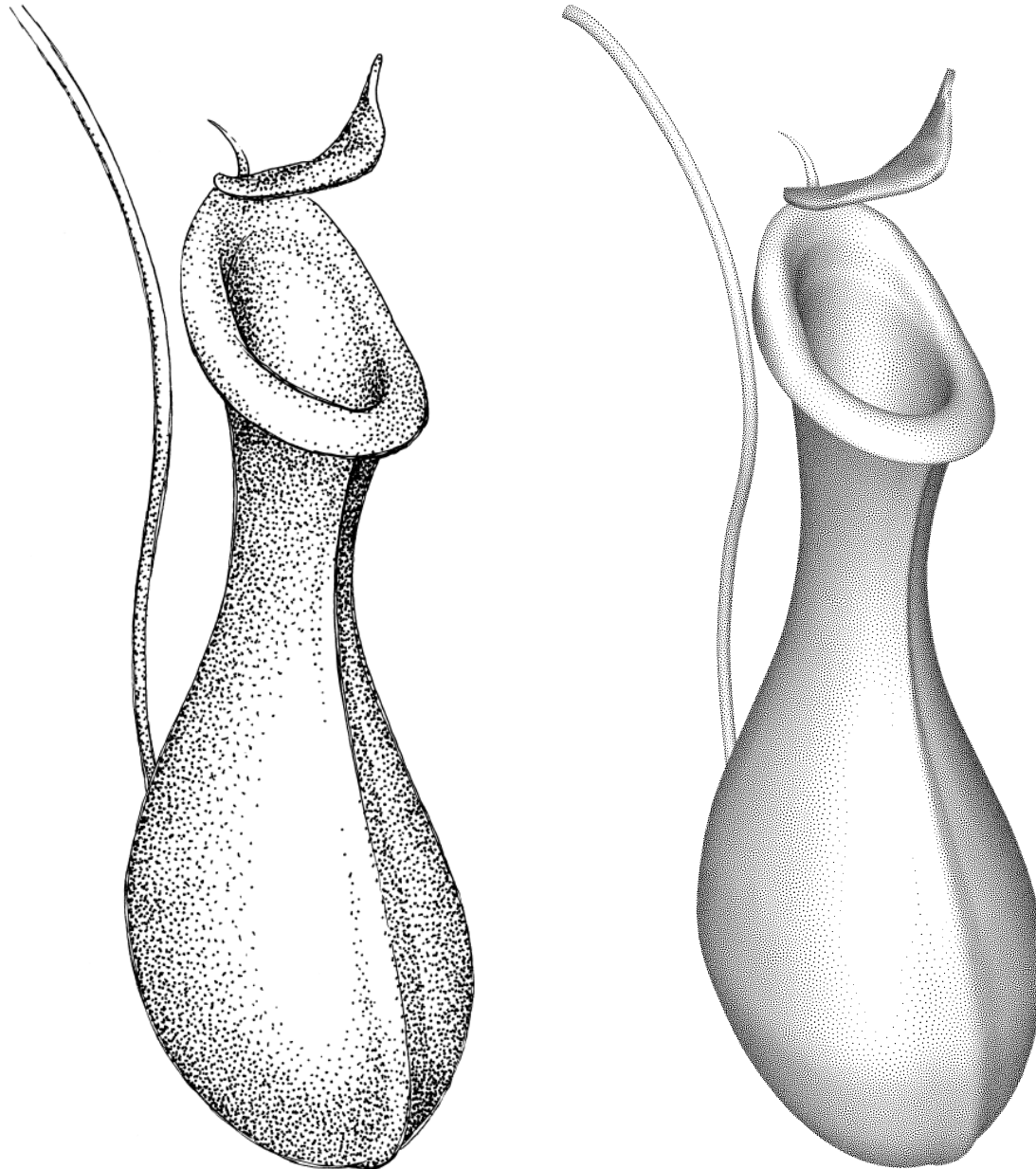
Study Setup: Procedure

- about 1 hour or less for each session
- three stages
 1. unconstrained pile-sorting:
grouping objects,
free choice of criteria
 2. semi-structured interview:
discussion of the piles
and predefined questions
 3. post-session questionnaire:
demographics and
previous experiences
- data acquisition through video and note taking

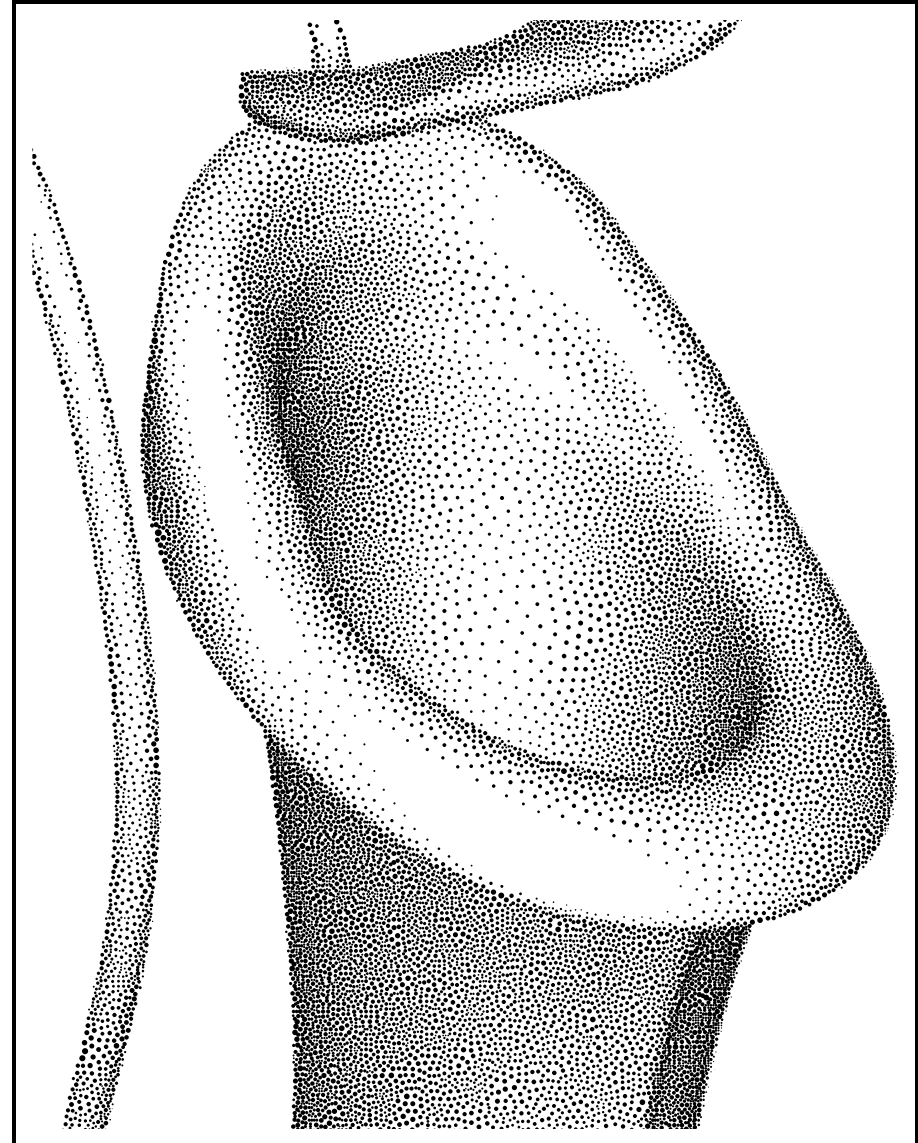
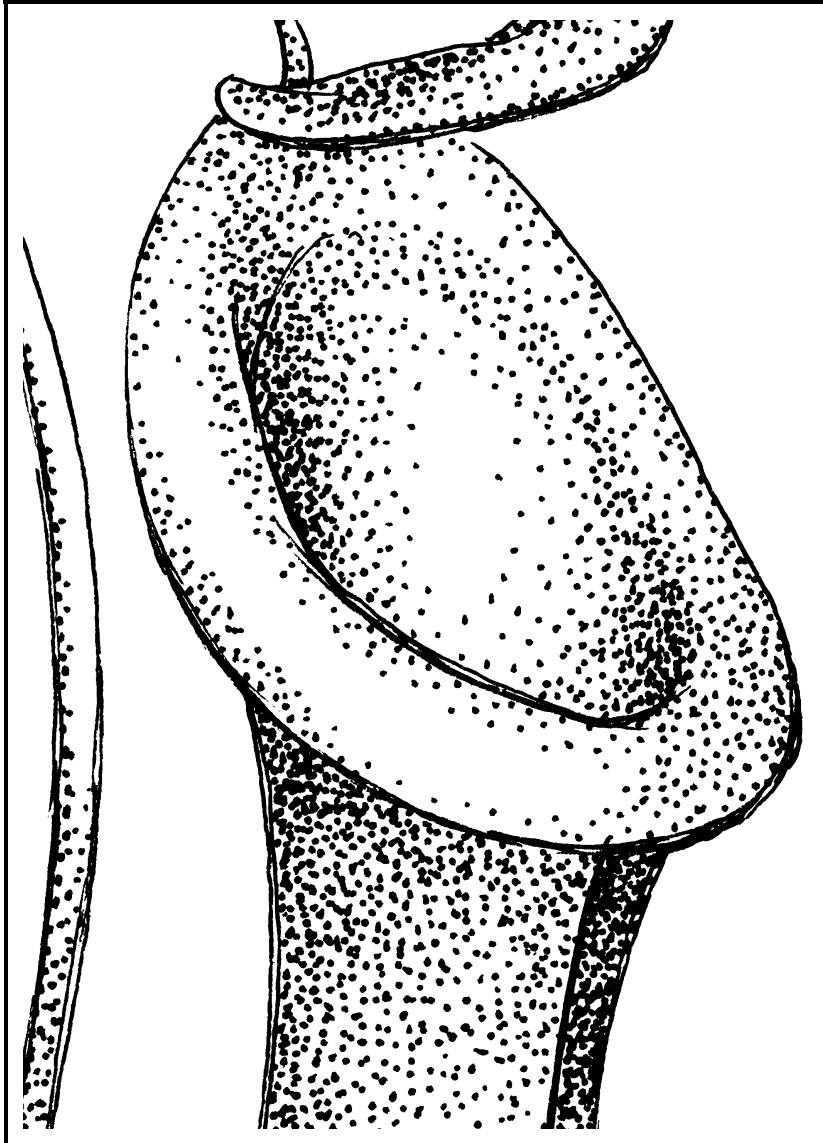


1. Hand-Drawn vs. Computer-Generated

Mark Density and Complexity

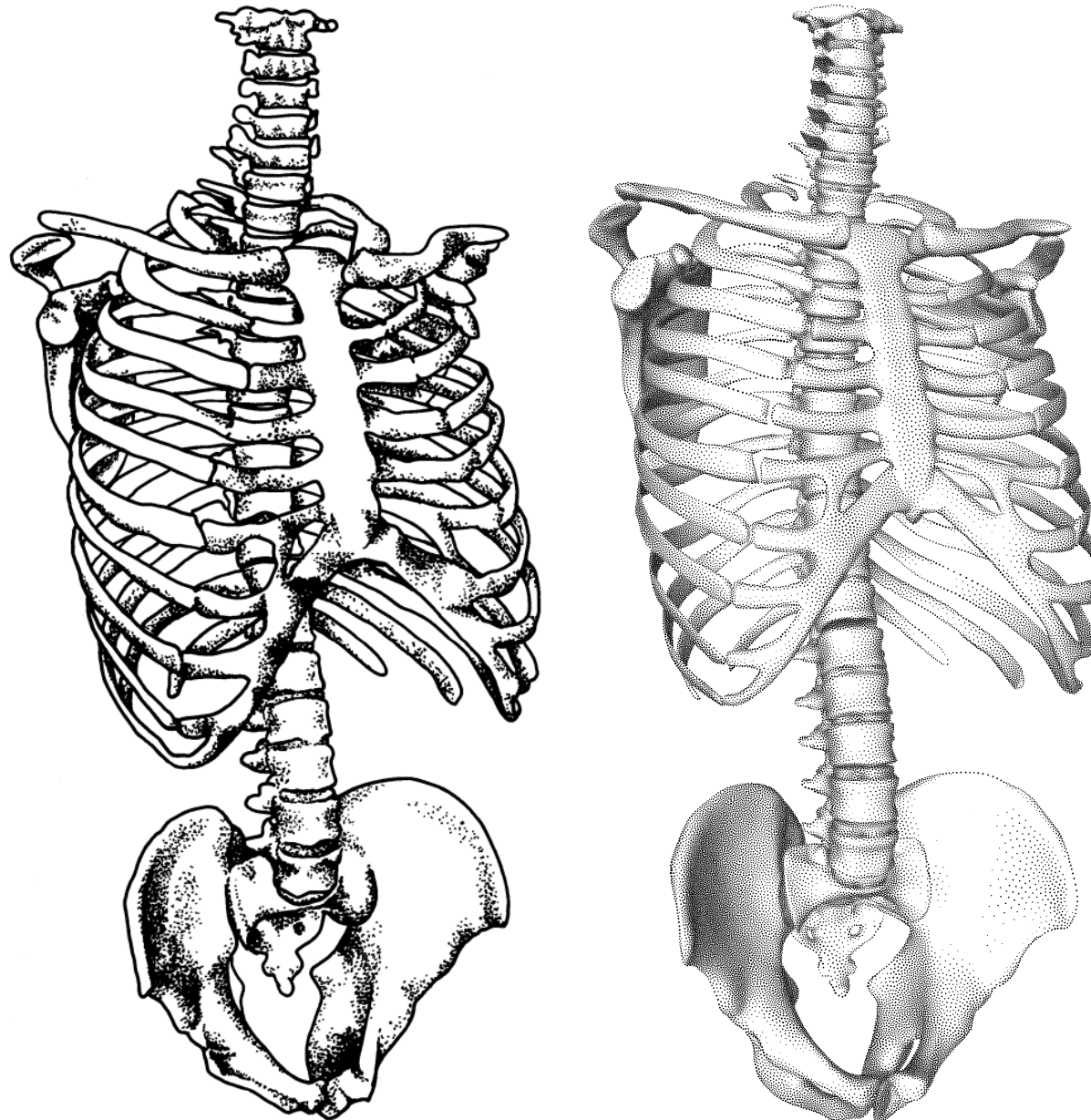


Mark Density and Complexity



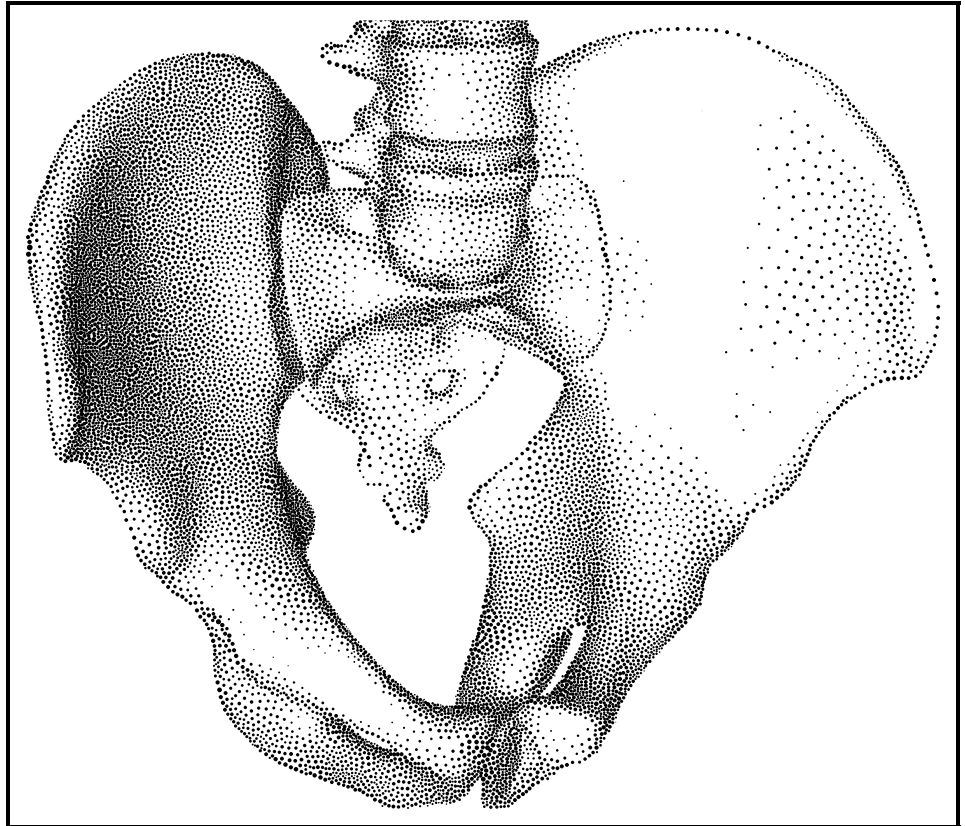
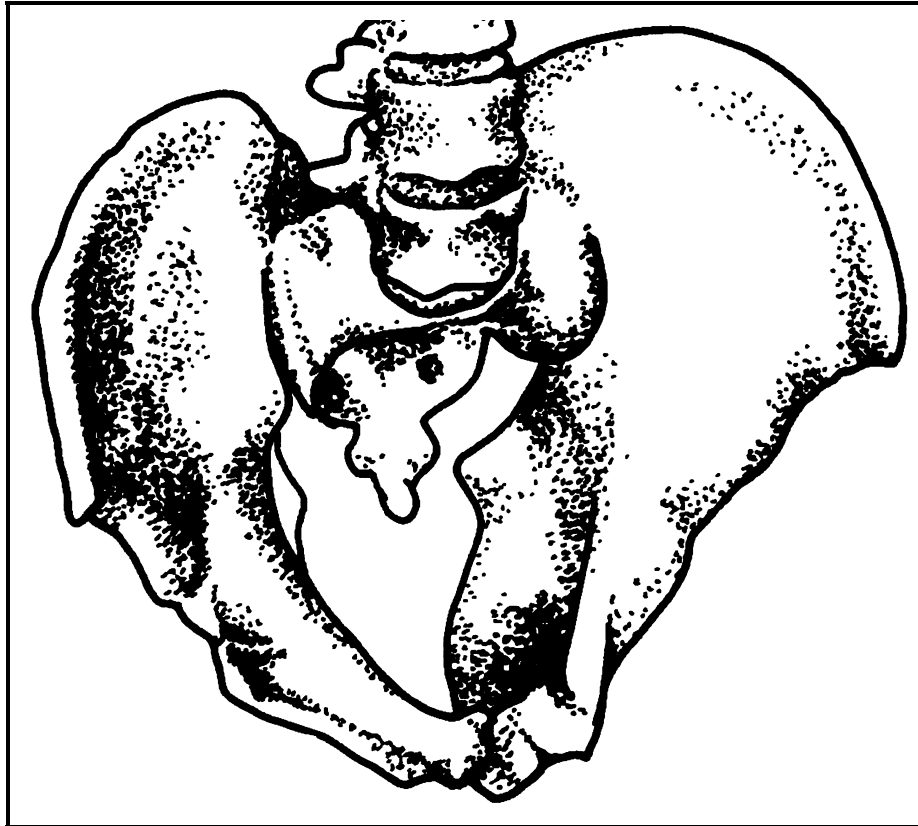
1. Hand-Drawn vs. Computer-Generated

Shading



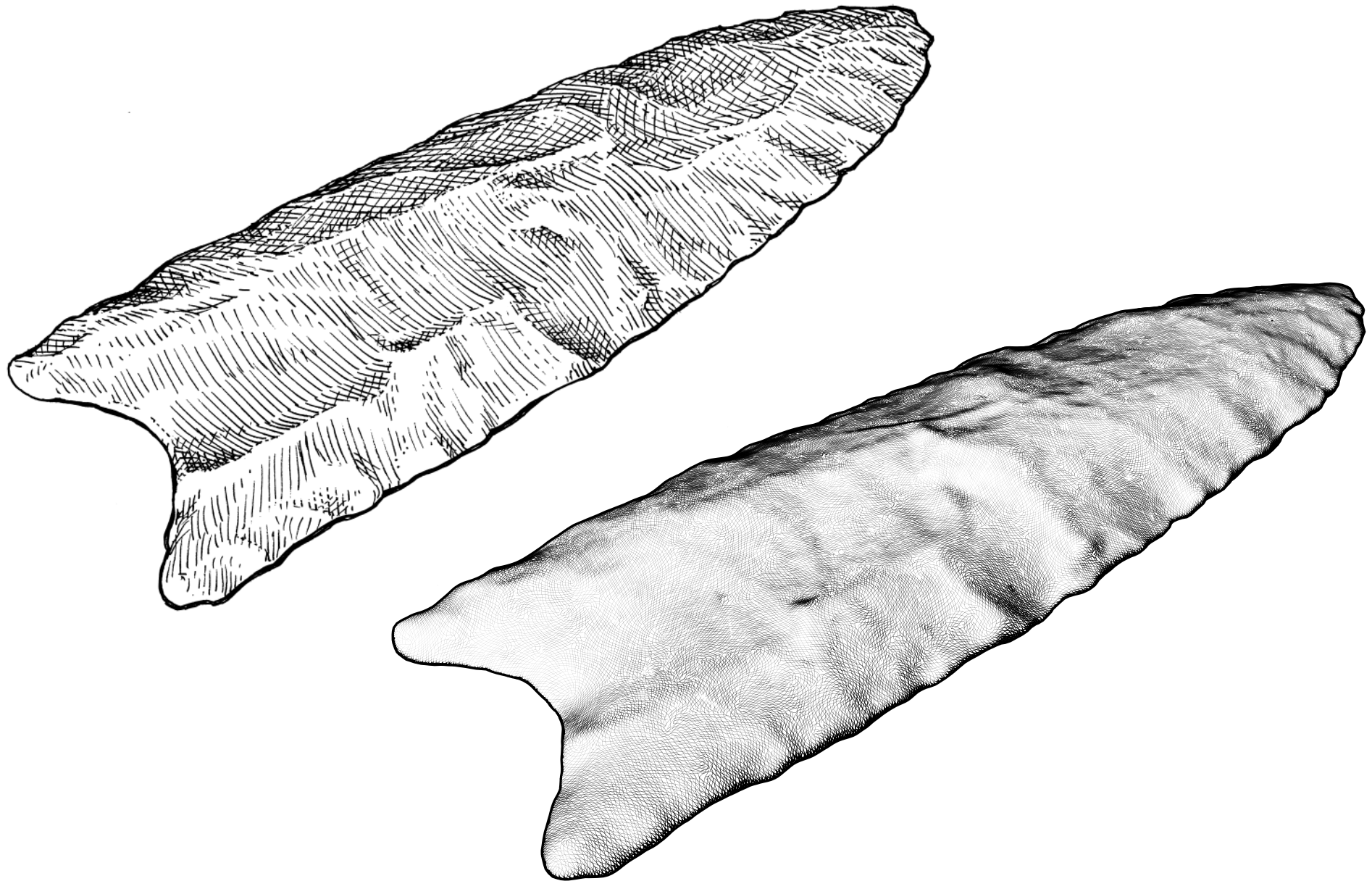
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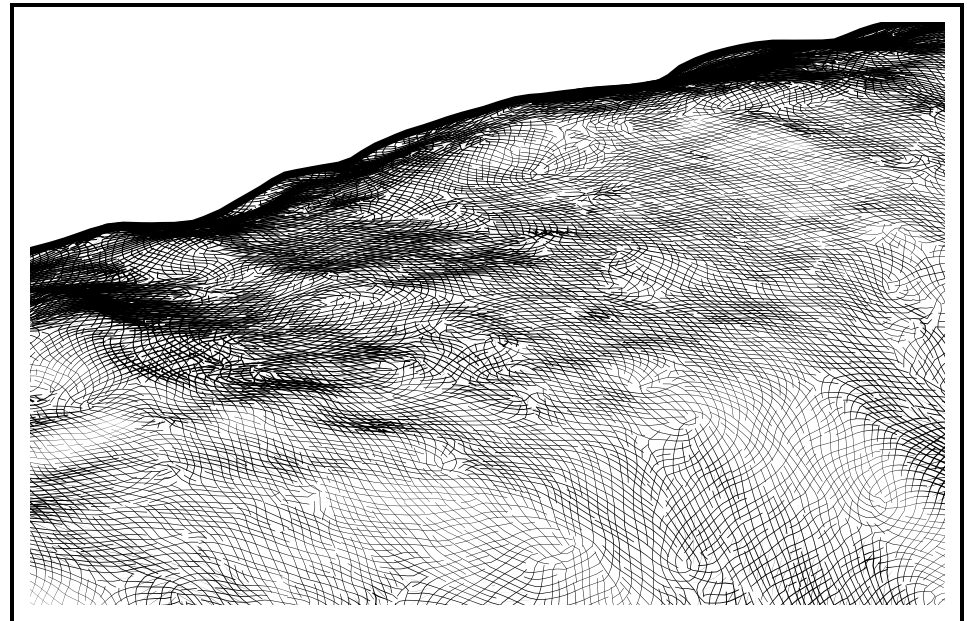
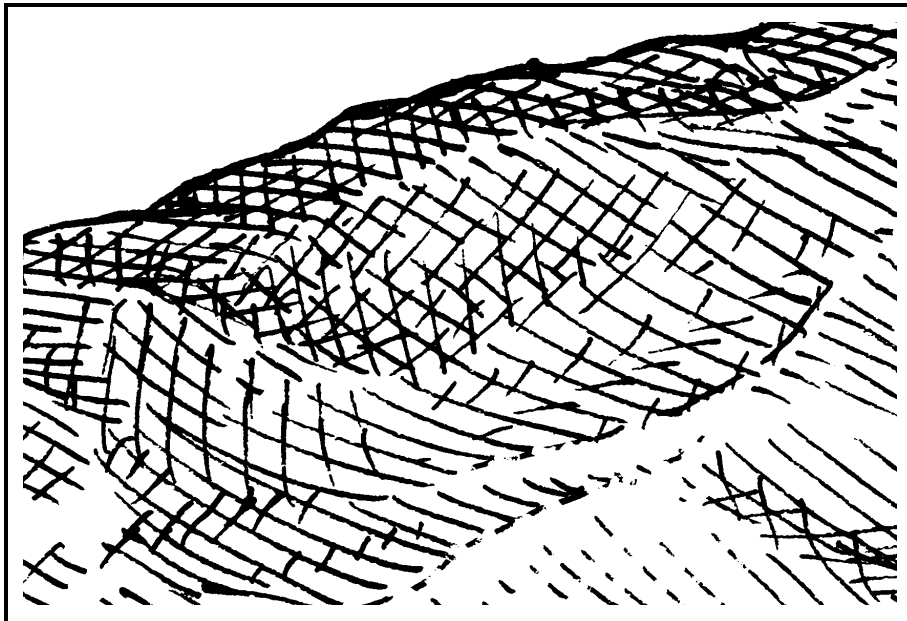
1. Hand-Drawn vs. Computer-Generated

Material Depiction



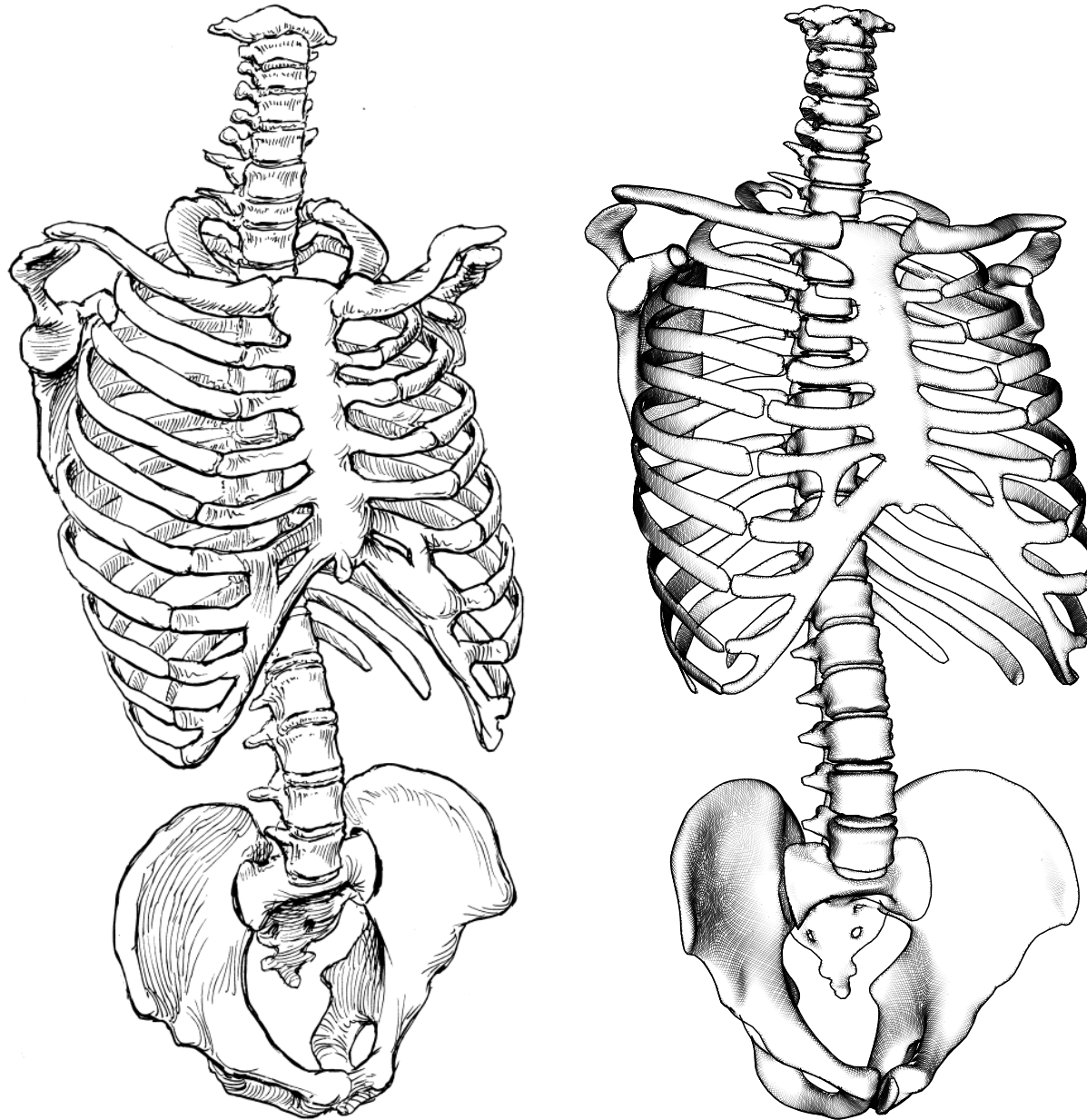
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Material Depiction



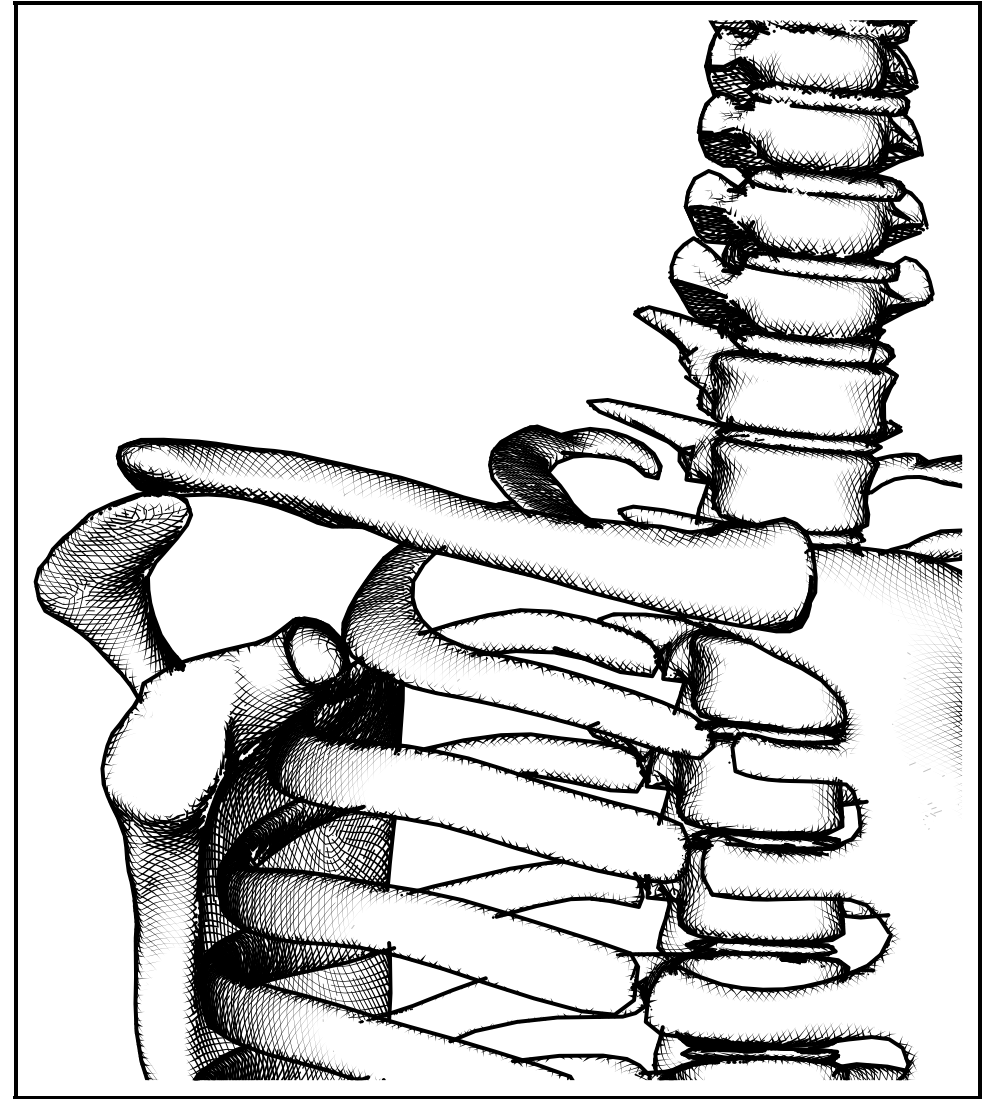
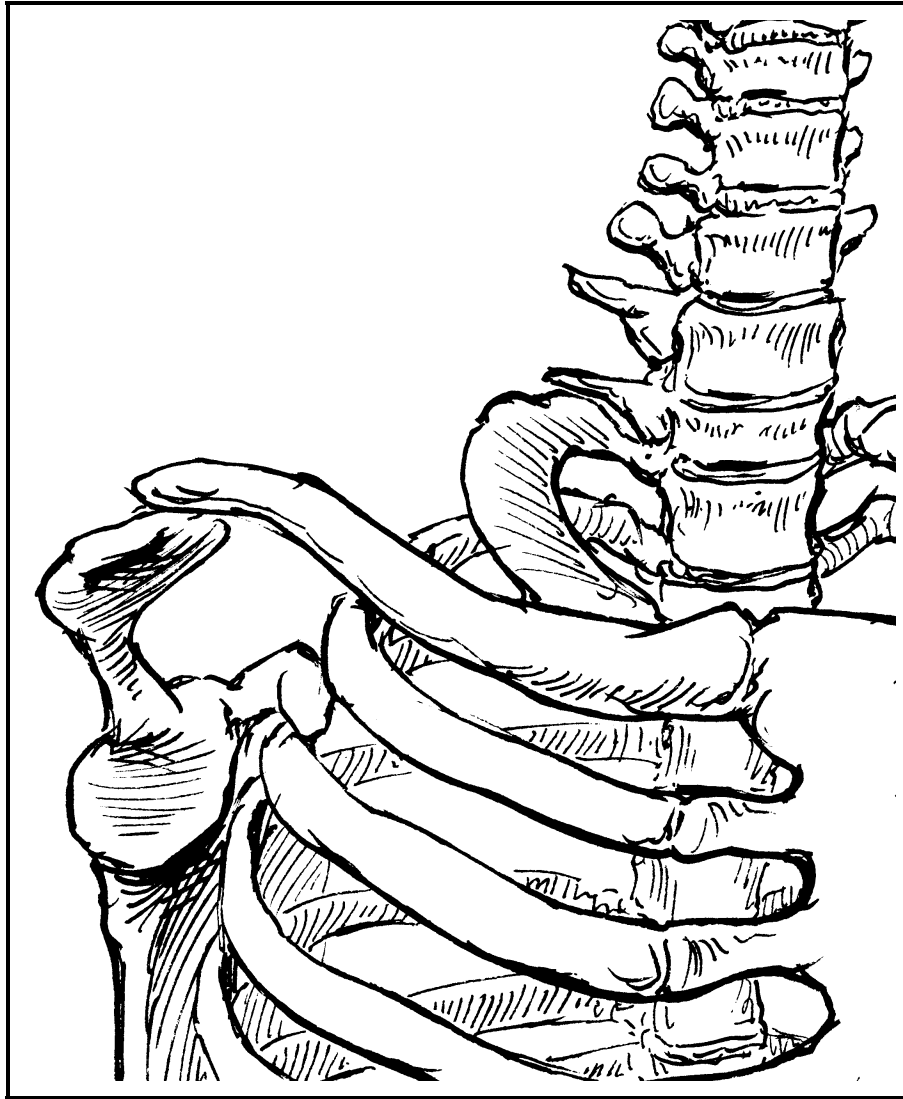
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Shape Depiction



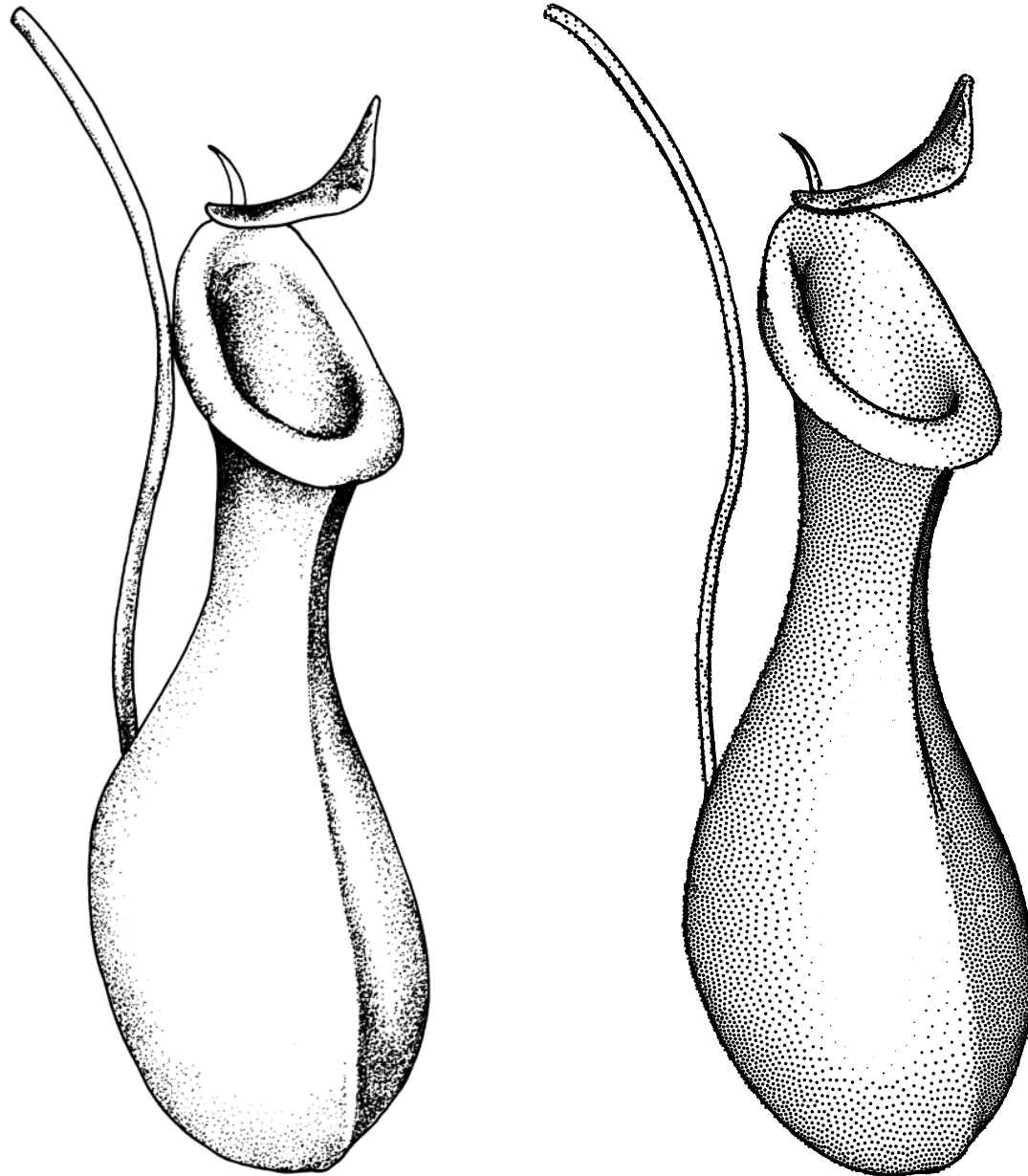
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Shape Depiction



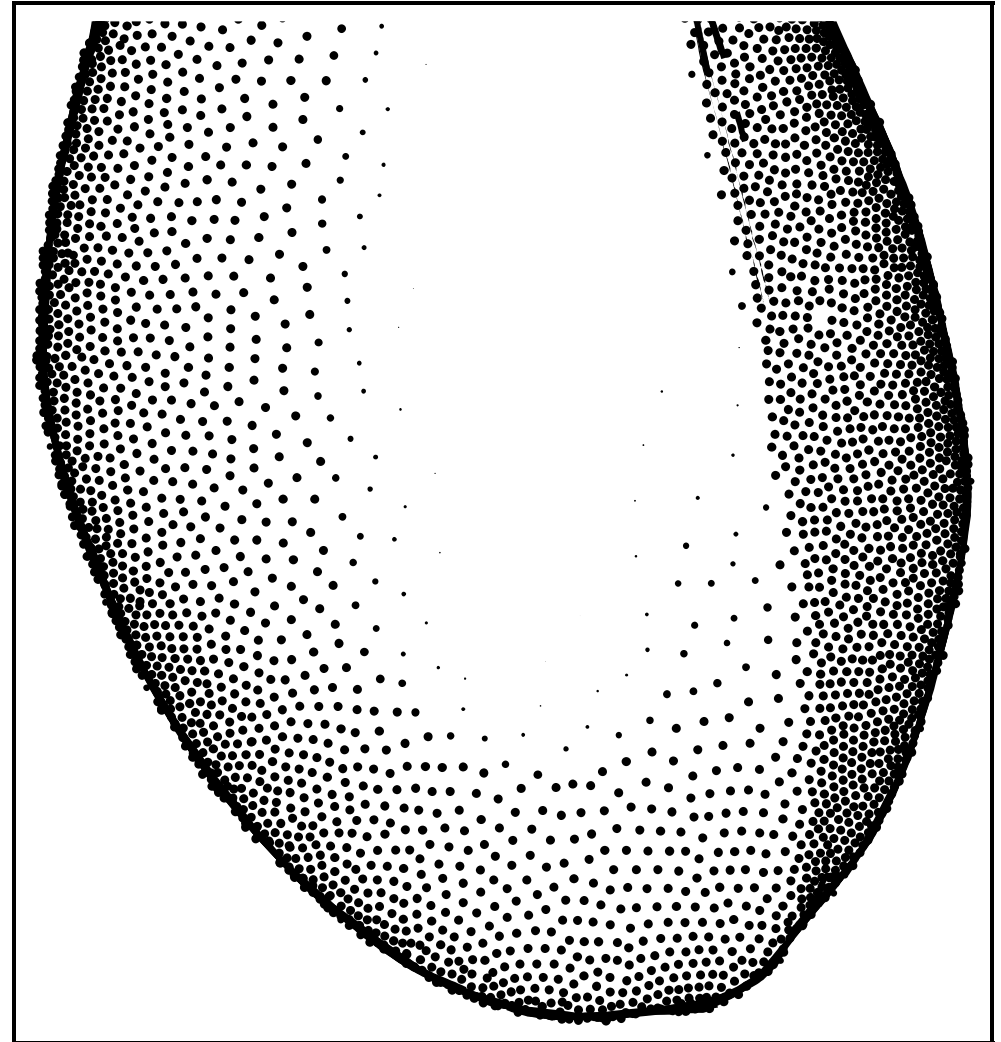
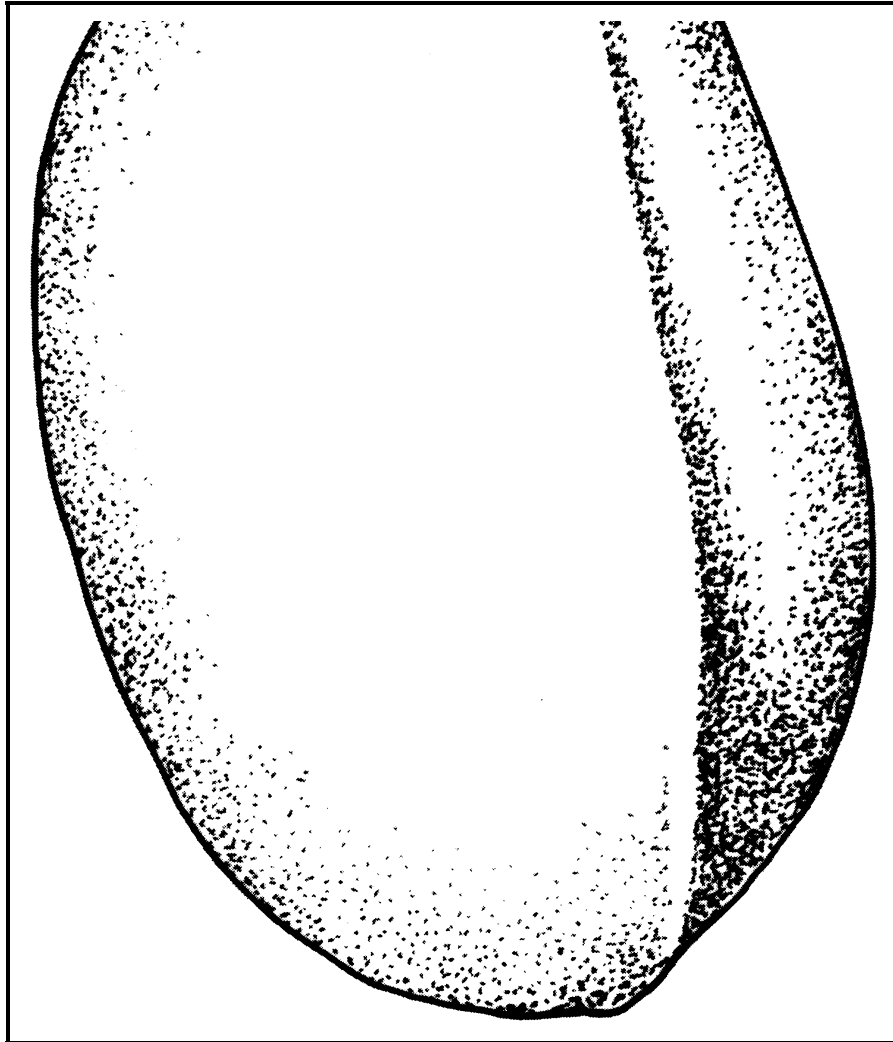
1. Hand-Drawn vs. Computer-Generated

Mark Artifacts



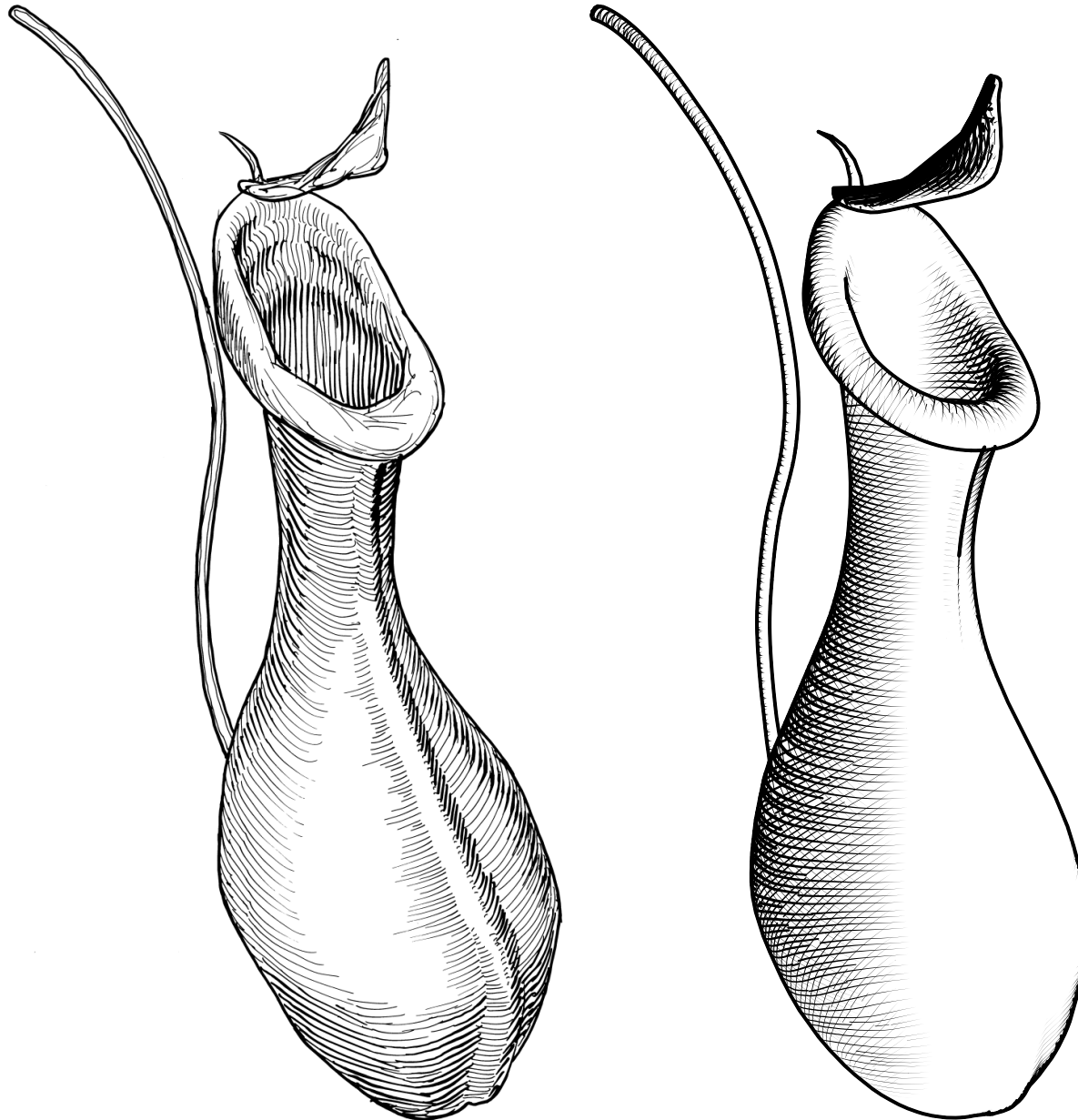
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Mark Artifacts

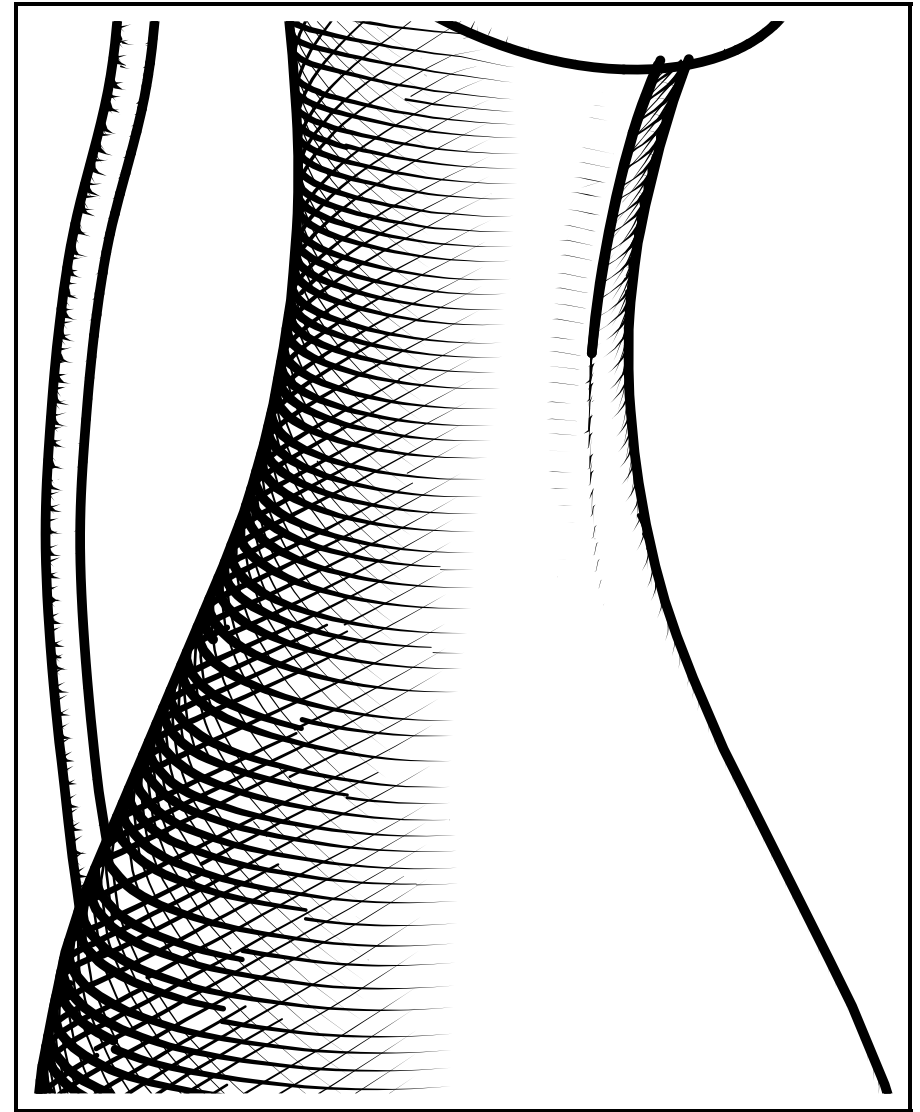
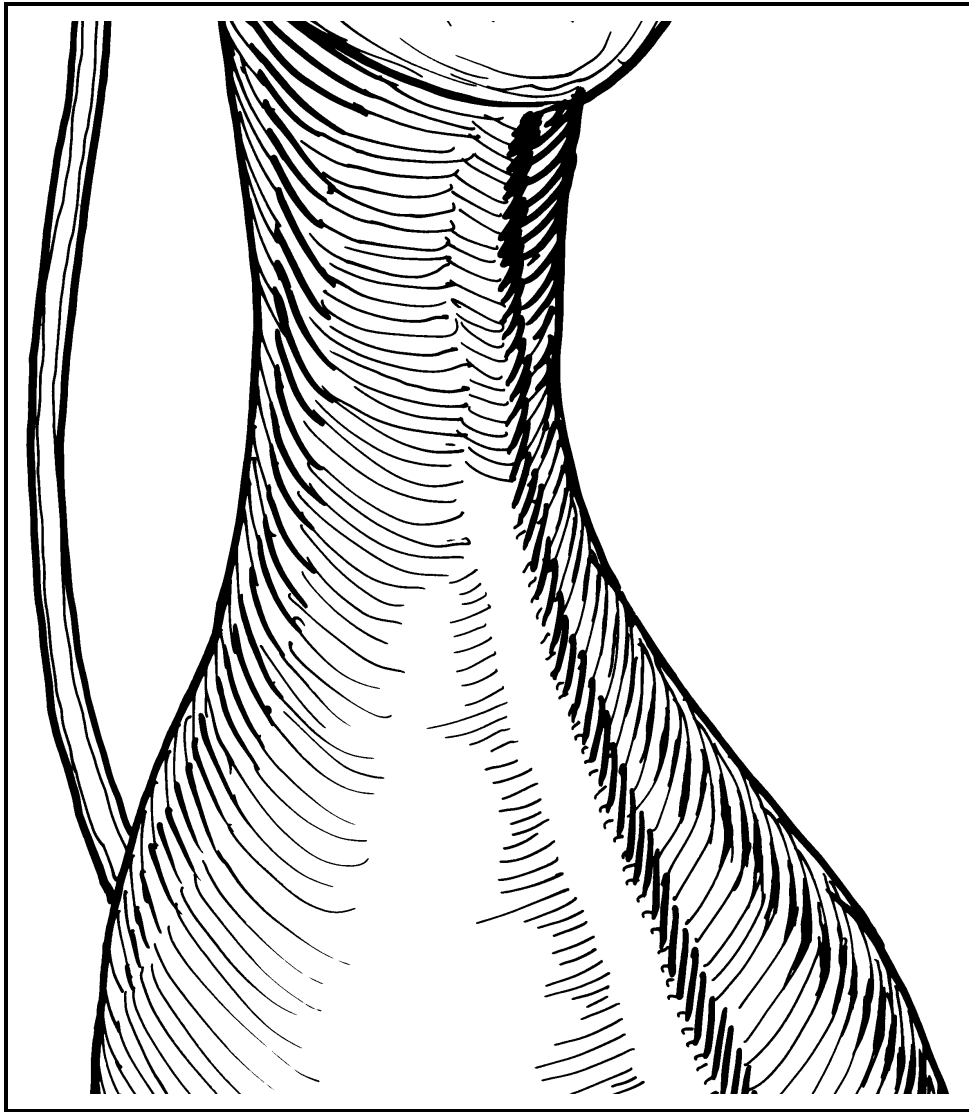


1. Hand-Drawn vs. Computer-Generated

Mark Characteristics and Placement

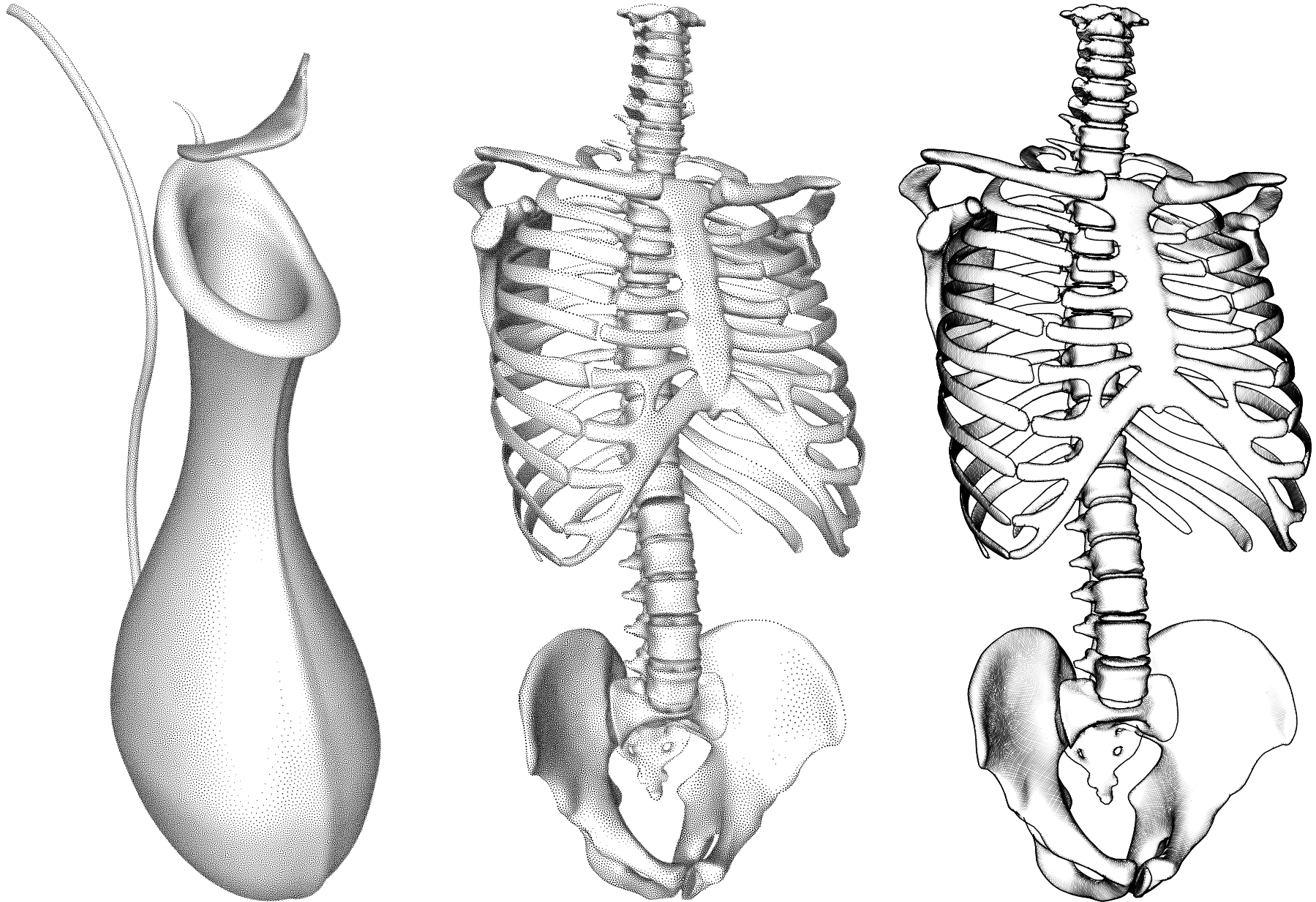


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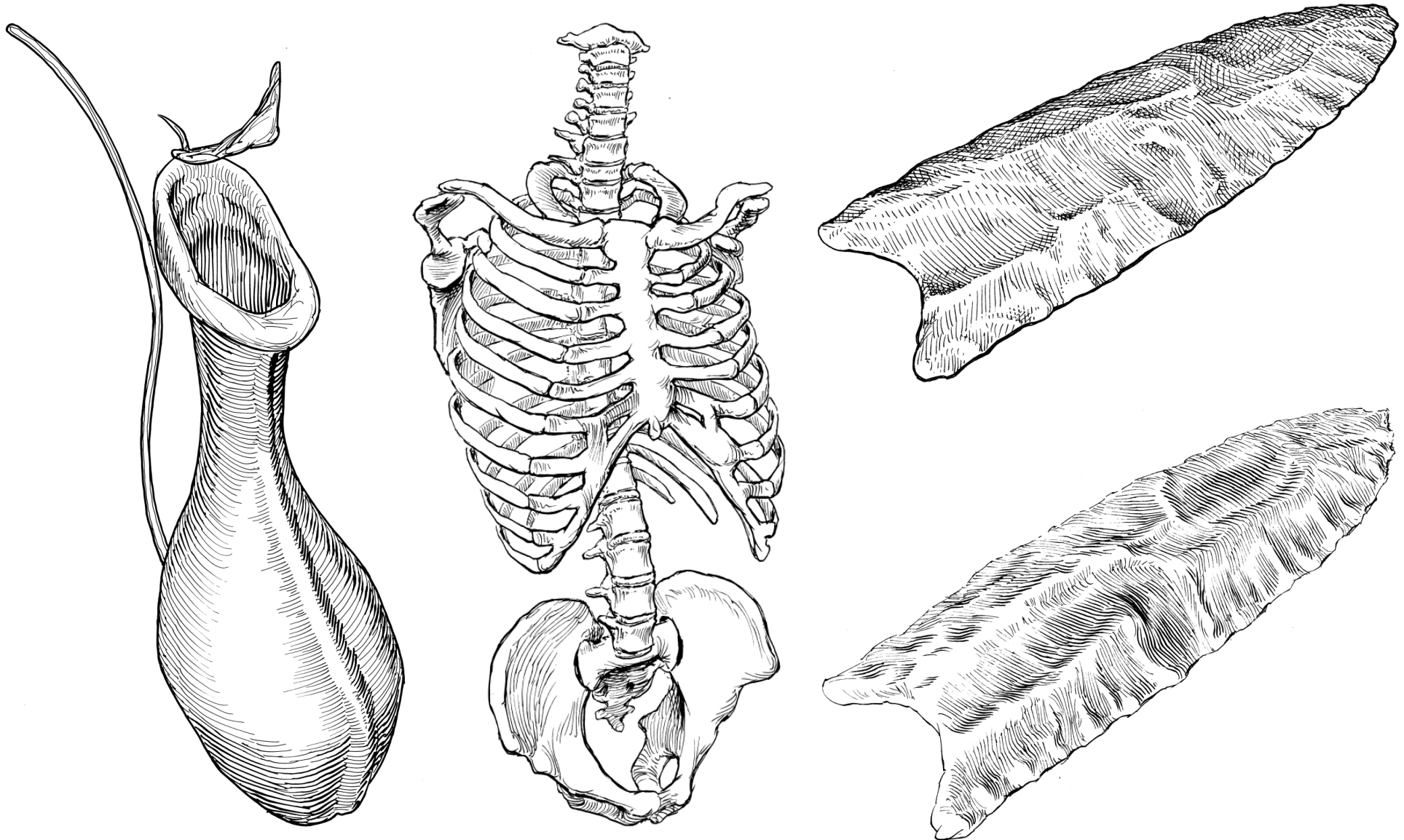
1. Image Aspects Liked and Disliked

CG Images Liked for Exactness and Detail



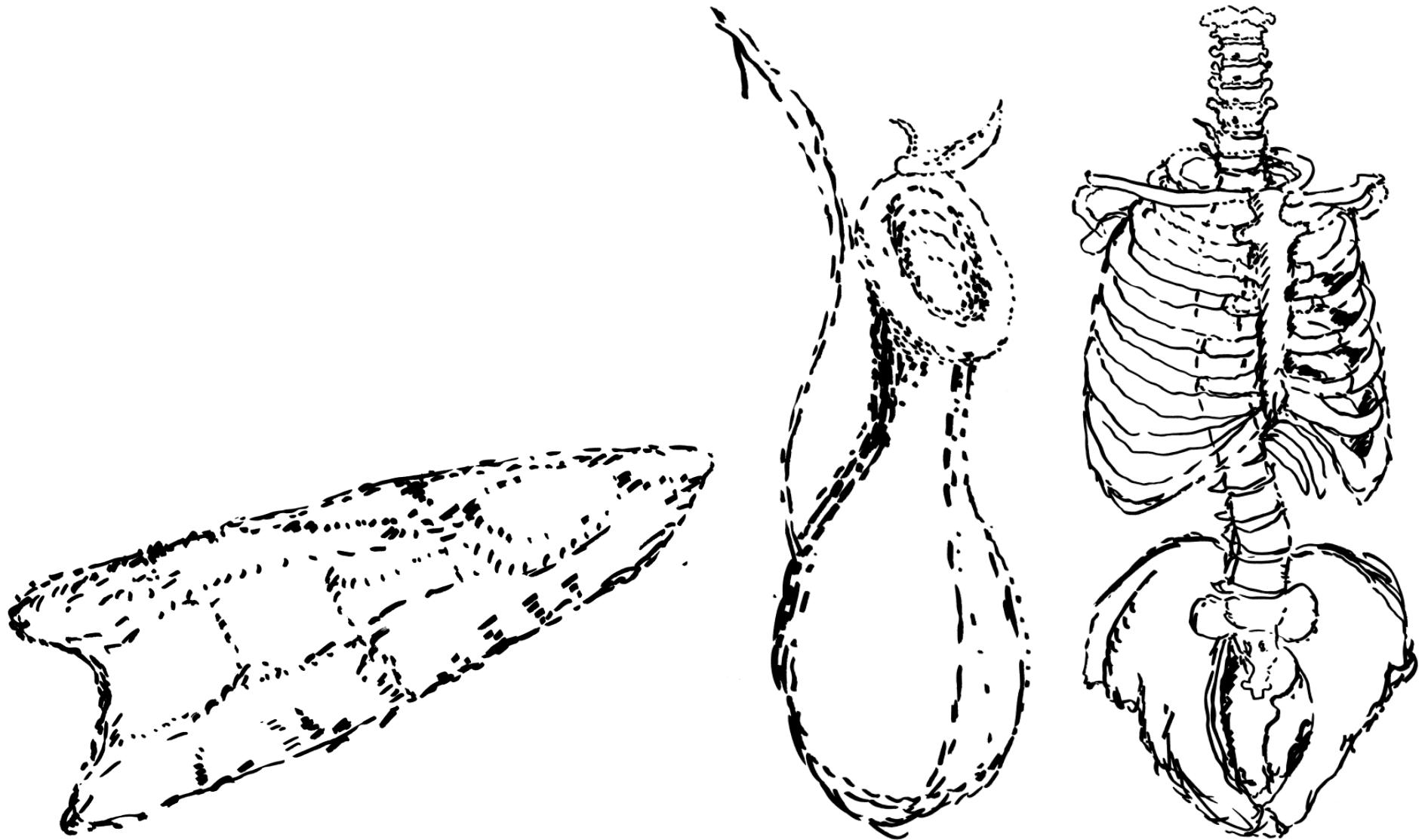
1. Image Aspects Liked and Disliked

Hand-Drawn Images Liked for their “Character”



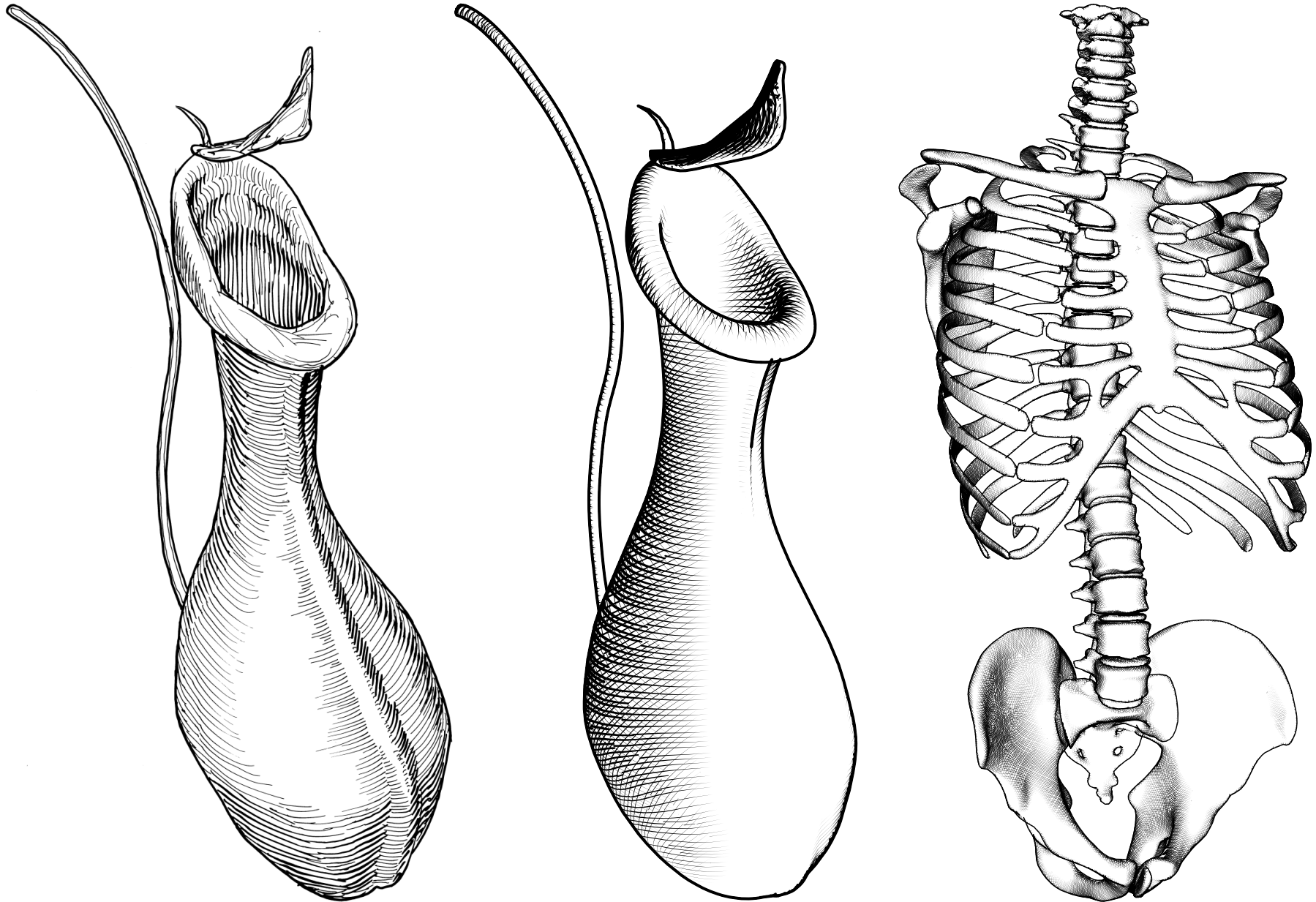
1. Image Aspects Liked and Disliked

Too Much Sketchiness Disliked (for Illustrations)



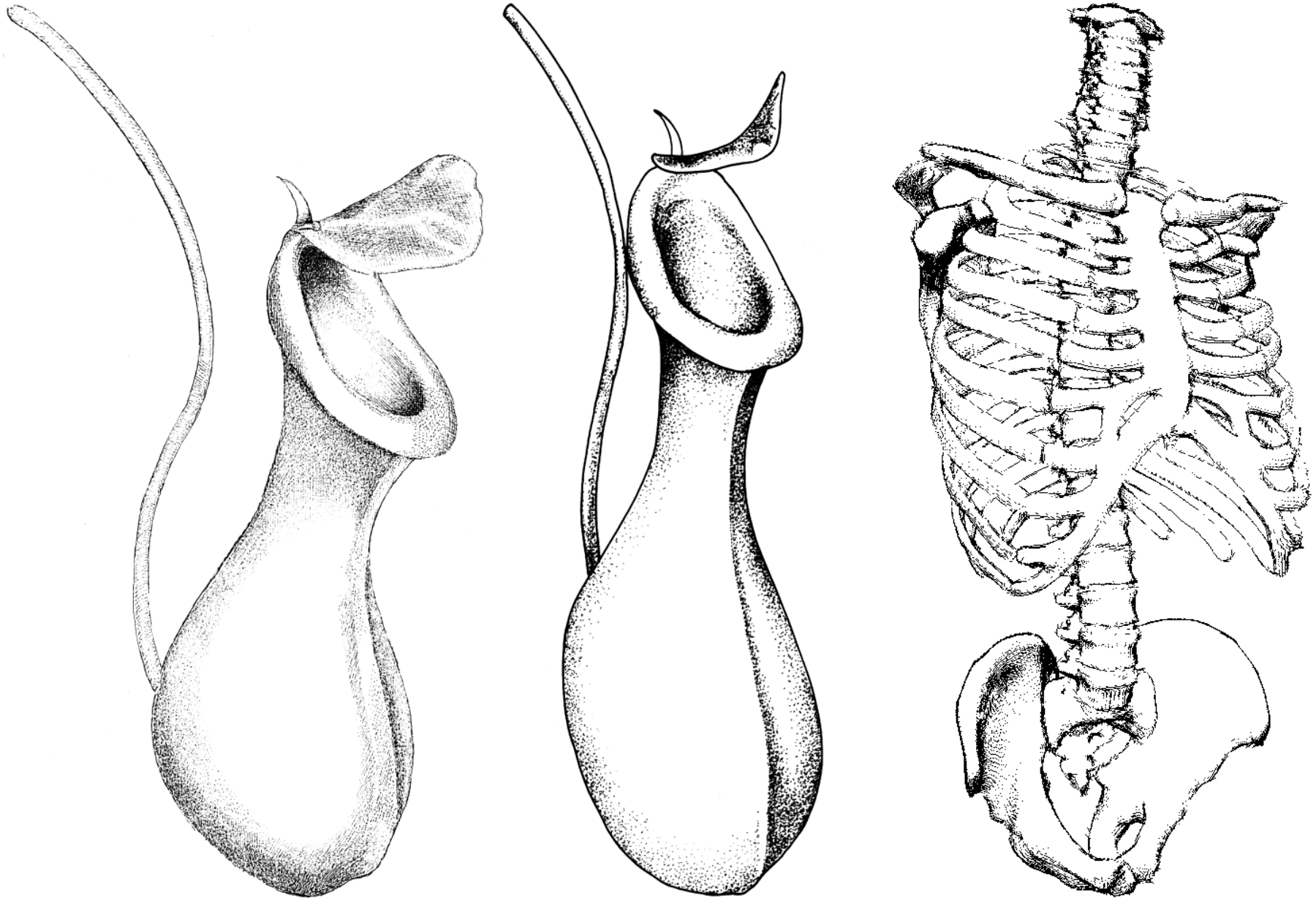
1. Image Aspects Liked and Disliked

Contrast Appreciated



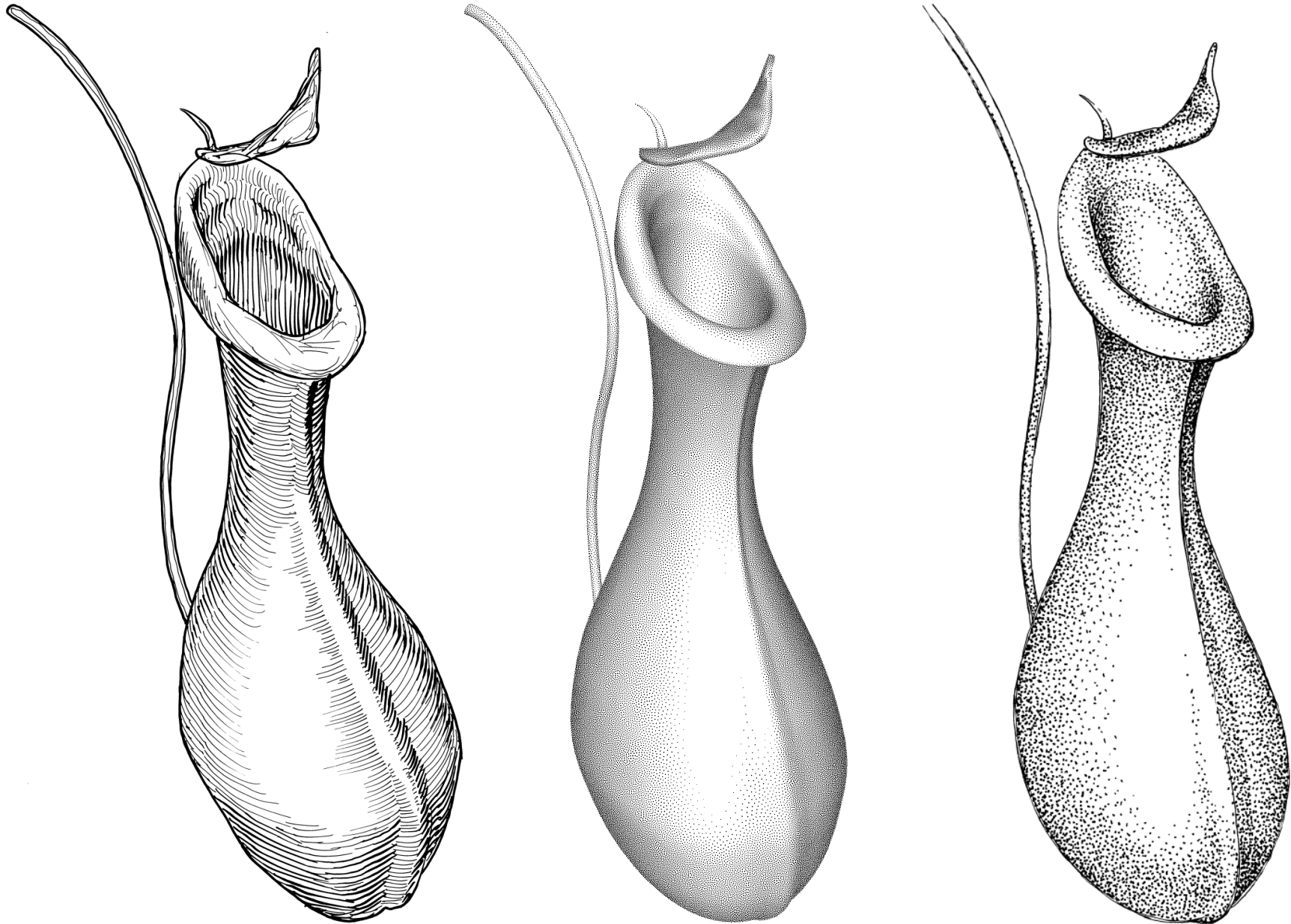
1. Image Aspects Liked and Disliked

Too Much Abstraction Disliked



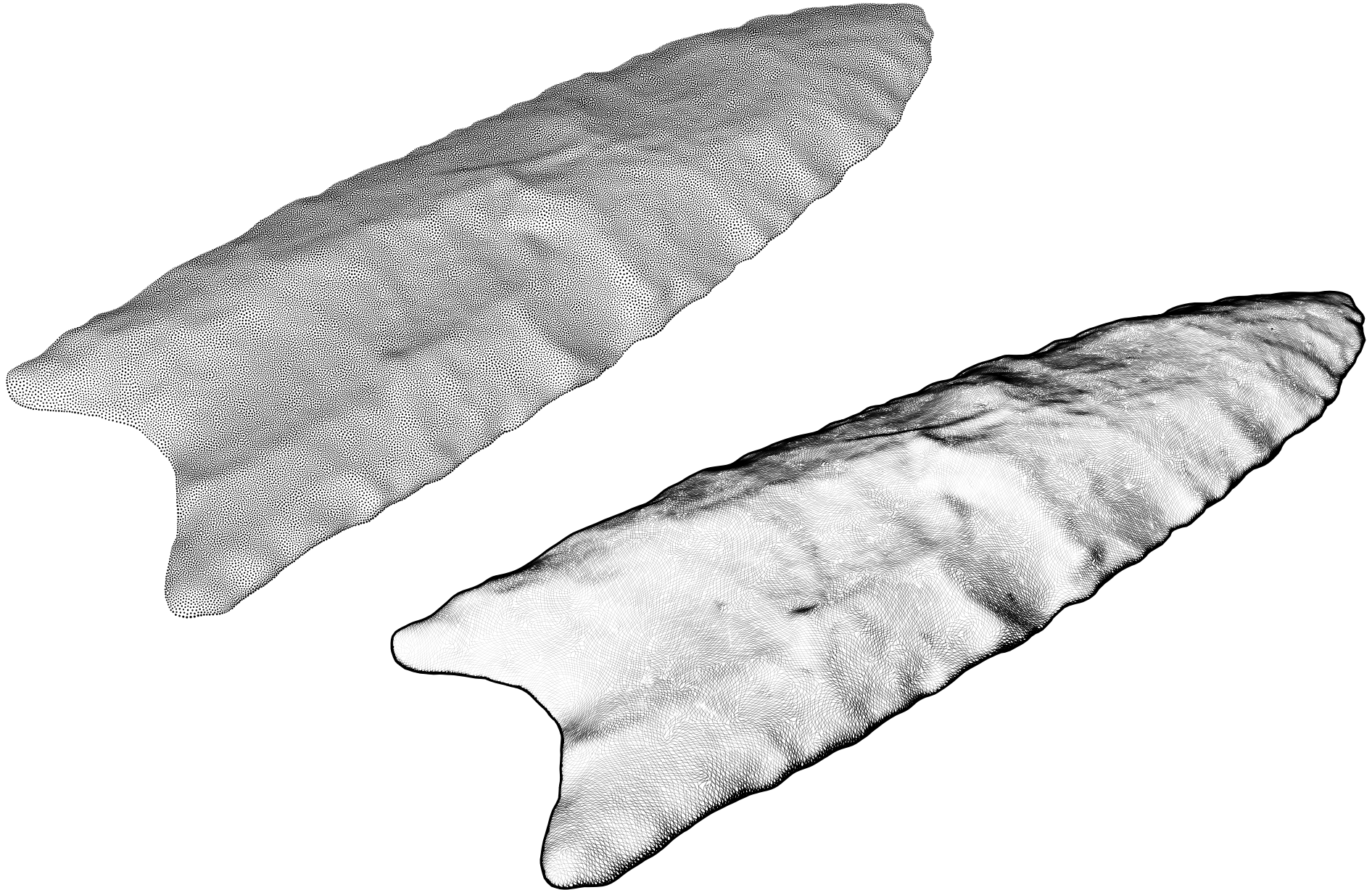
1. Image Aspects Liked and Disliked

Tonal Range Appreciated



1. Image Aspects Liked and Disliked

Too Little Tonal Range Disliked



Lessons Learned

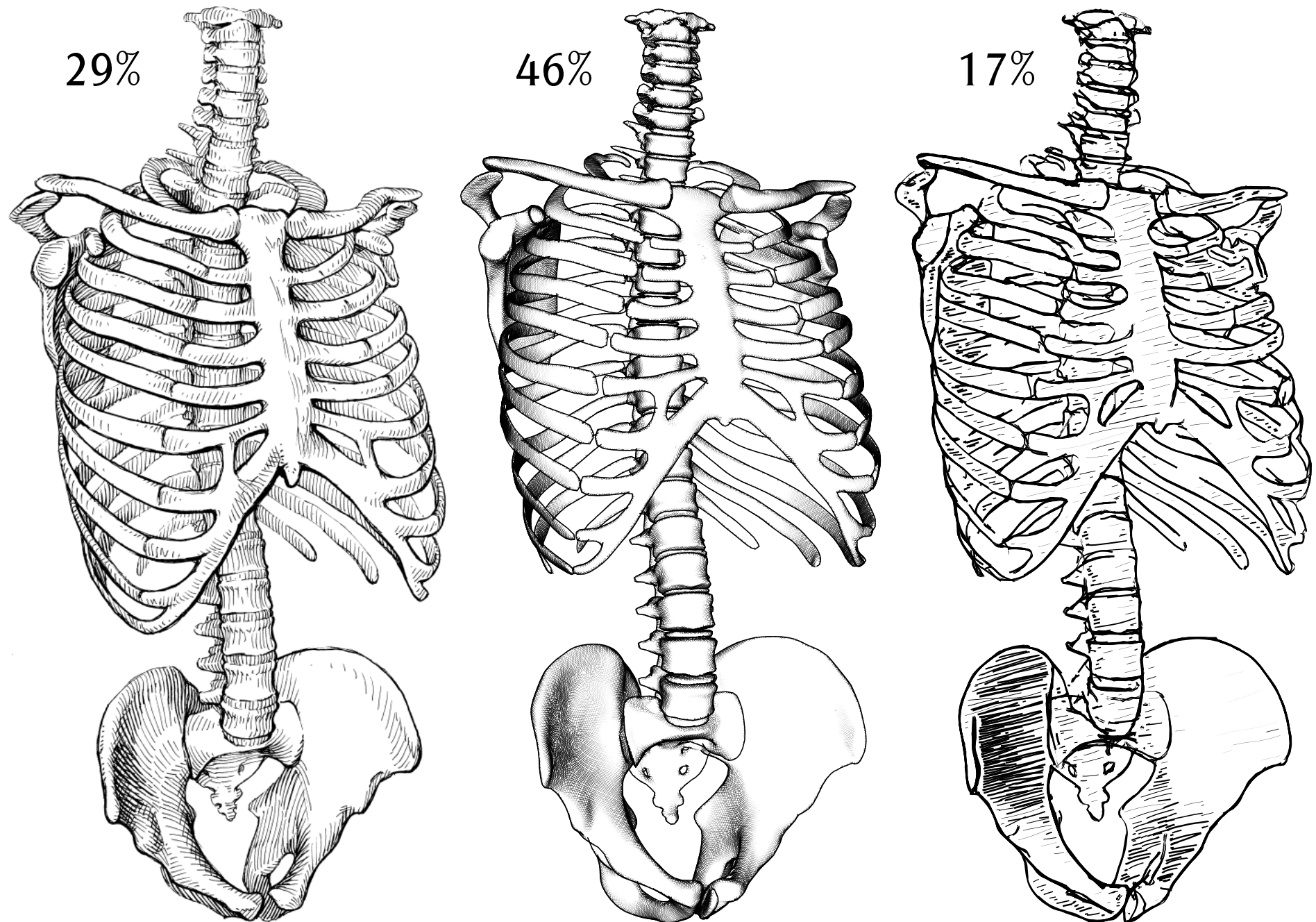
- noticeable differences between computer-generated and hand-drawn illustrations
- guidelines for improvement
- image liking depending on context
- both computer-generated and hand-drawn images liked
- diverging opinions about what is good aesthetics

Lessons Learned

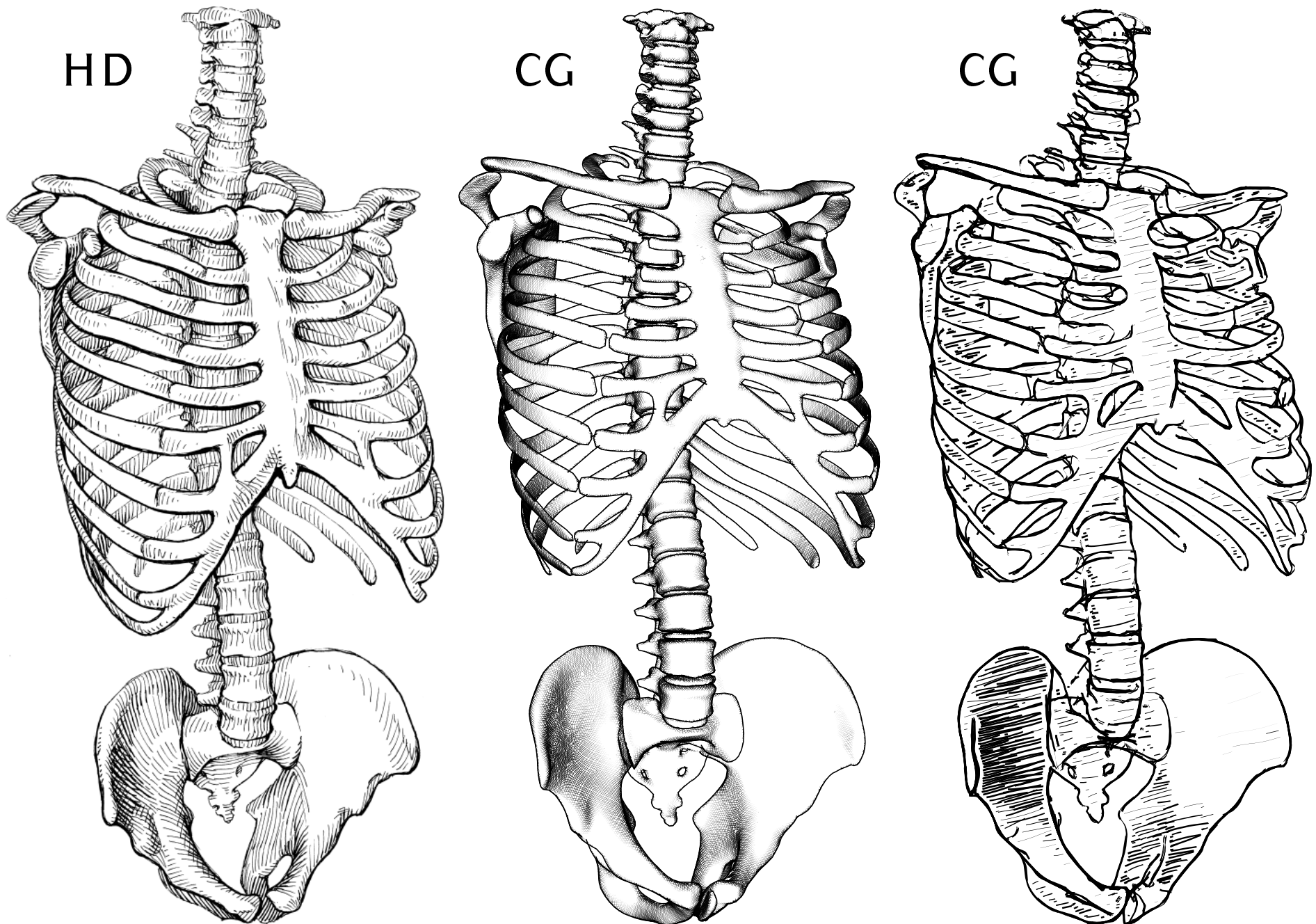
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T. Isenberg, P. Neumann, S. Carpendale, M. Costa Sousa, and J. Jorge.
Non-Photorealistic Rendering in Context: An Observational Study.
In Proc. of NPAR 2006, ACM Press, 2006.

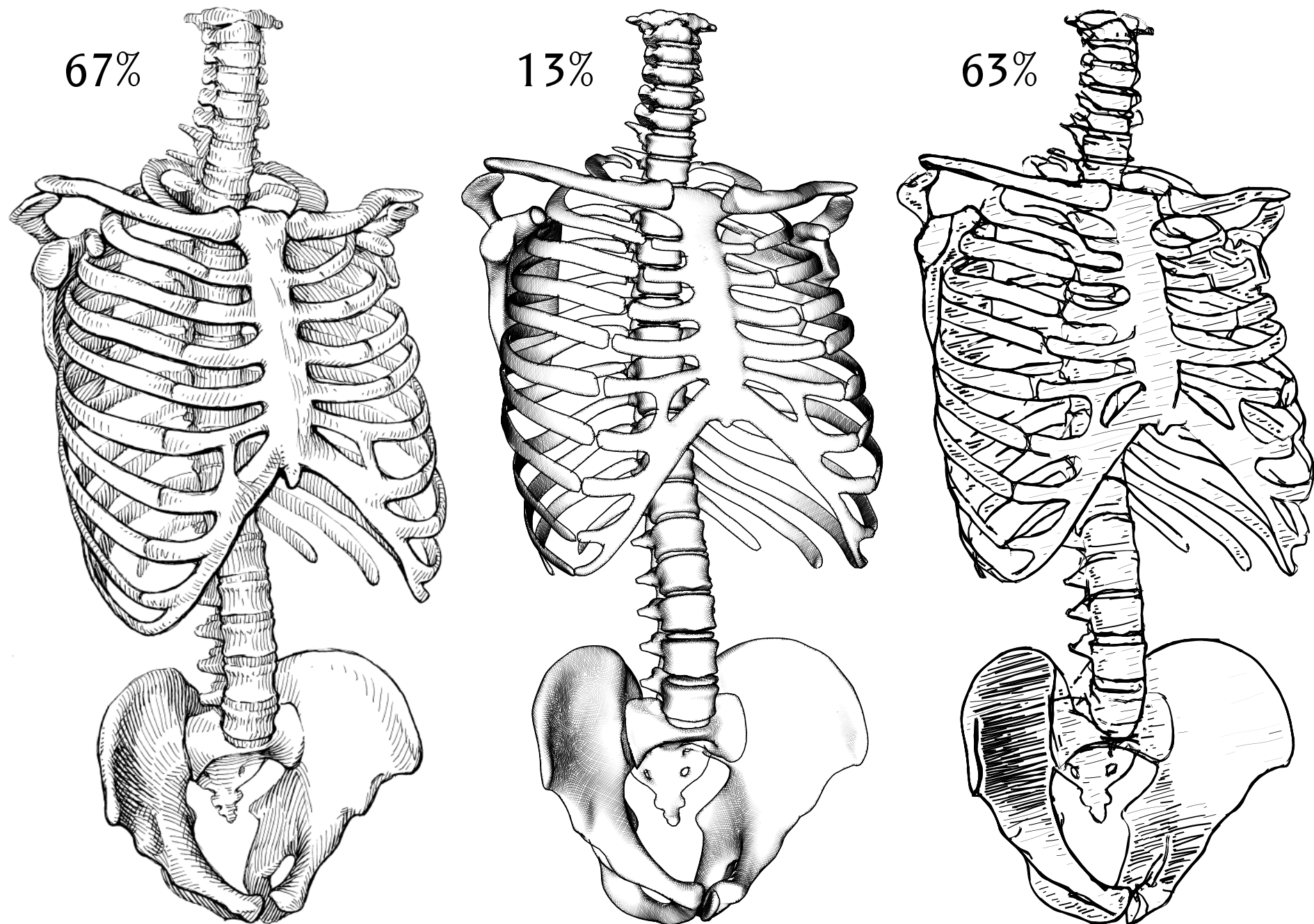
Percentages images were particularly liked by participants



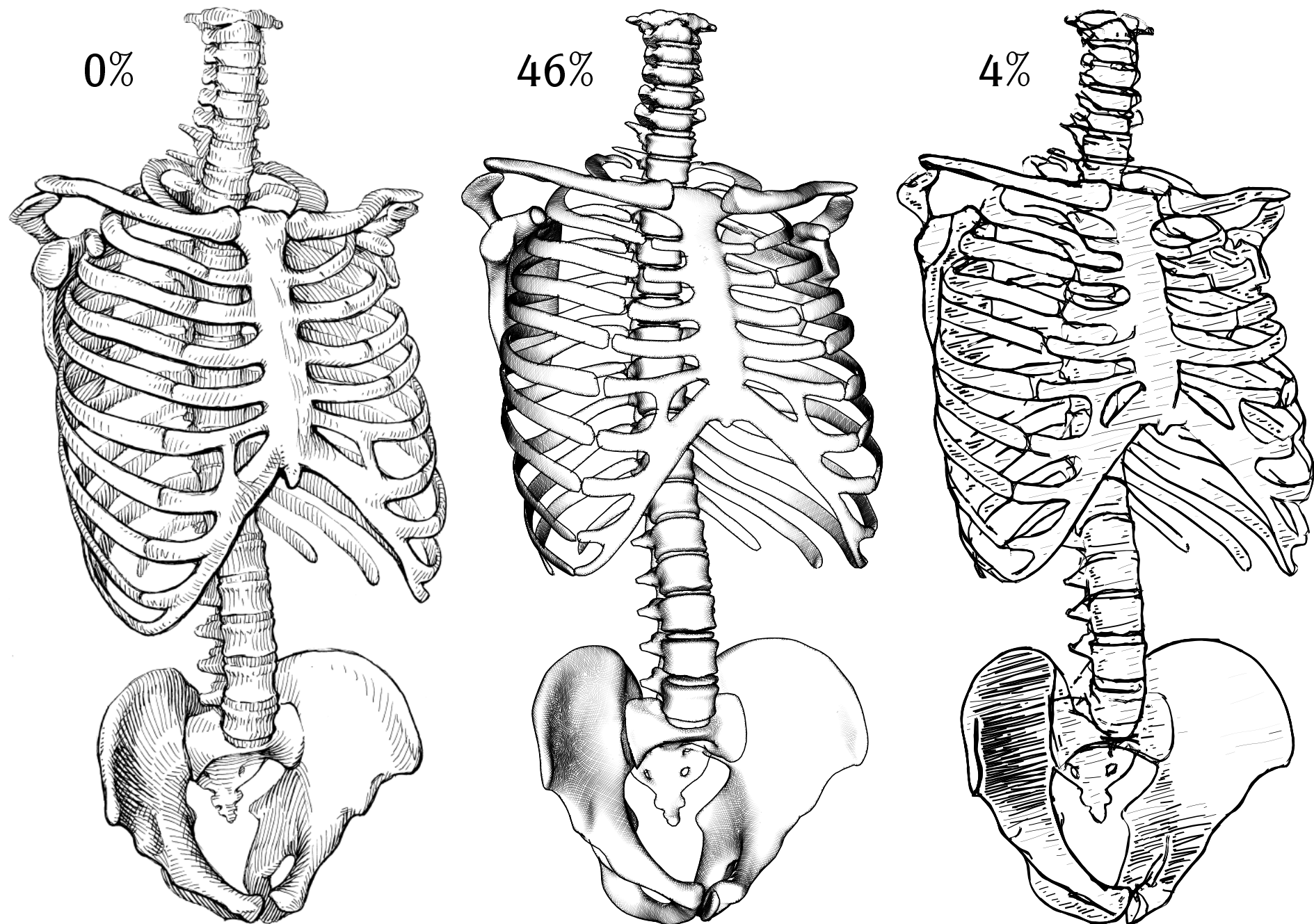
Hand-drawn or computer-generated?



Percentages images stood out as hand-drawn for participants



Percentages images stood out as computer-generated for participants



Thanks for your attention!

Special thanks to illustrators William M. Andrews, Davide Brunelli, Humberto Costa Sousa Filho, Andrew E. B. Swift, and Lynda Smith Touart and to Tobias Germer & Adrian Secord!

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