Terevaka Archaeological Outreach (TAO) 2019 Field Report: Creating Digital Access to Cultural Heritage

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Since 2003, Terevaka Archaeological Outreach (TAO, Founded by Dr. Britton Shepardson) has offered unique experiential learning activities to raise awareness regarding cultural and natural resources on Rapa Nui, to promote conservation initiatives, and to conduct original research regarding the island's prehistoric human–environment interactions. TAO has now offered educational experiences for more than 250 local island high school students and built a robust collaborative network with the local Museo Antropológico Padre Sebastián Englert (MAPSE), Hotel Explora Rapa Nui, and a variety of governmental and non-governmental institutions. In 2019, TAO students focused on two distinct projects: (1) the metric and photographic documentation of matā or obsidian blades in the MAPSE collection; and (2) the development of an interactive virtual exploration website for an interior region of the island that is rich with archaeological heritage.

Keywords: education, conservation, TAO

Introduction

The Terevaka Archaeological Outreach (TAO) program recently completed its seventeenth year of educational activities on Rapa Nui during July 2019. TAO's three primary goals in

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Fig. 1. Students and staff of TAO 2019 with Hotel Explora Rapa Nui employees.

working with island high school students are: (1) to offer experiential learning opportunities specific to cultural and natural resources that surround the local community; (2) to promote awareness and expertise in conservation measures and sustainable development; and (3) to document and study both cultural and natural phenomena of the past and today.

Twenty island students between the ages of thirteen and eighteen attended the two-week educational program in 2019. For the duration of the program, students camped on the property of Hotel Explora and Mike Rapu, participated in classroom sessions regarding the island's prehistory, conducted field and laboratory research, attended guest lectures by local experts, and explored the island in guided tours (see Figs. 1–5).

TAO projects of 2019 build upon a tradition of non-invasive research, reinforcing the notion of sustainable development on the island, and promoting resourcefulness and expertise in a wide variety of professional careers (Shepardson et al. 2004, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2018; Torres & Shepardson 2005; Shepardson 2006, 2010, 2013; Rutherford et al. 2008; Shepardson & Torres 2009; Petney et al. 2015; Sullivan et al. 2018).

Specifically, the 2019 TAO curriculum revolved around two projects. Both projects were designed: (1) to introduce students to a number of different field and laboratory tools and methods that are directly applicable to a wide variety of future careers on the island; (2) to generate a hands-on experience to help raise awareness and responsibility for the conservation of cultural resources amongst the island's youth; and (3) to enhance local knowledge about methods in creating remote/digital access to cultural resources on the island.

In the first project, TAO students used scales, calipers, a DSLR camera, digital microscopes, and Microsoft Excel to weigh, measure, photograph, catalog, and package obsidian artifacts from the repository of the Museo Antropológico Padre Sebastián Englert (MAPSE). In the second project, TAO students used tape measures, compasses, handheld

Fig. 2. Students attending a guided tour by TAO guest lecturer Dale Simpson, Jr. at Ahu Ko te Riku.

GPS units, a DSLR camera, and Agisoft Metashape Professional software to produce maps and images that can be used to build an interactive website offering a virtual reality exploration of a portion of the island's interior that is outside of the Rapa Nui National Park protected area.

Matā Research

The tanged obsidian artifacts, *matā*, have become a focal point for archaeological research on Rapa Nui. Early publications assumed that *matā* production began and intensified in the late pre-contact period on the island, ca. 1600–1722 (Heyerdahl 1961; McCoy 1979; Bahn & Flenley 1992). However, more recent research suggests that the *matā* industry of Rapa Nui may have developed centuries earlier (Steadman et al. 1994; Stevenson & Williams 2018).

Matā have also been used for cross-cultural comparisons in the Pacific, as they have been identified in archaeological contexts in the Chatham Islands (Skinner 1923), the Marquesas Islands (Charleaux 2015), New Britain (Torrence et al. 2009, 2013), New Zealand (Jones 1981), and even Pitcairn (Heyerdahl & Ferdon 1961) and Hawai'i. However, researchers tend to note that the dominant raw material for formation of *matā* outside of Rapa Nui seems to have been sources other than obsidian (*e.g.*, basalt, chert).

Matā appear with such abundance at many archaeological sites and in archaeological excavations that they provide potential not only for a better understanding of prehistoric lithic technology (*e.g.*, Barthel 1958; Mulloy & Figueroa 1978; Stevenson et al. 1984;

Fig. 3. TAO students conducting research at the local museum laboratory.

Church & Rigney 1994; Church & Ellis 1996; Church 1998; Ayres et al. 2000; Bollt et al. 2006; Kononenko et al. 2015; Lipo et al. 2016; Shepardson et al. 2018), but also for subsistence activities (*e.g.*, Simpson 2010; Stevenson & Williams 2018), conflict or violence (*e.g.*, Agüera 1770; Thomson 1891; Cooke 1899; Routledge 2005; Métraux 1940; Ayres & Ayres 1995; Flas 2012; Hunt & Lipo 2012; Lipo et al. 2016), and even sociopolitical and/or ceremonial organization (*e.g.*, Métraux 1940; McCoy 1979; Stevenson 1984; Thomas 2009; Mulrooney 2012; Stevenson et al. 2013; Mulrooney et al. 2014).

Interestingly, researchers approaching *matā* from different methodological perspectives have repeatedly arrived at conflicting conclusions. Ethnohistoric and firsthand accounts of

Fig. 4. Students attending a field lecture by TAO Director Britton Shepardson at Ahu Tongariki.

the eighteenth, nineteenth, and twentieth centuries regularly contextualized the *matā* in warfare and violence (Agüera 1770; Thomson 1891; Cooke 1899; Routledge 2005; Métraux 1940; Barthel 1958). And some detailed use-wear analyses claim to have identified evidence for the use of these artifacts to cut or pierce skin (Torrence et al. 2018). However, Polynesian analogs, other use-wear analyses, and morphometric statistics have suggested that the *matā* of Rapa Nui likely served as a sort of "multipurpose" tool—some explicitly stressing the lack of evidence for hypotheses regarding *matā* as weapons (Hunt & Lipo 2012; Lipo et al. 2010, 2016).

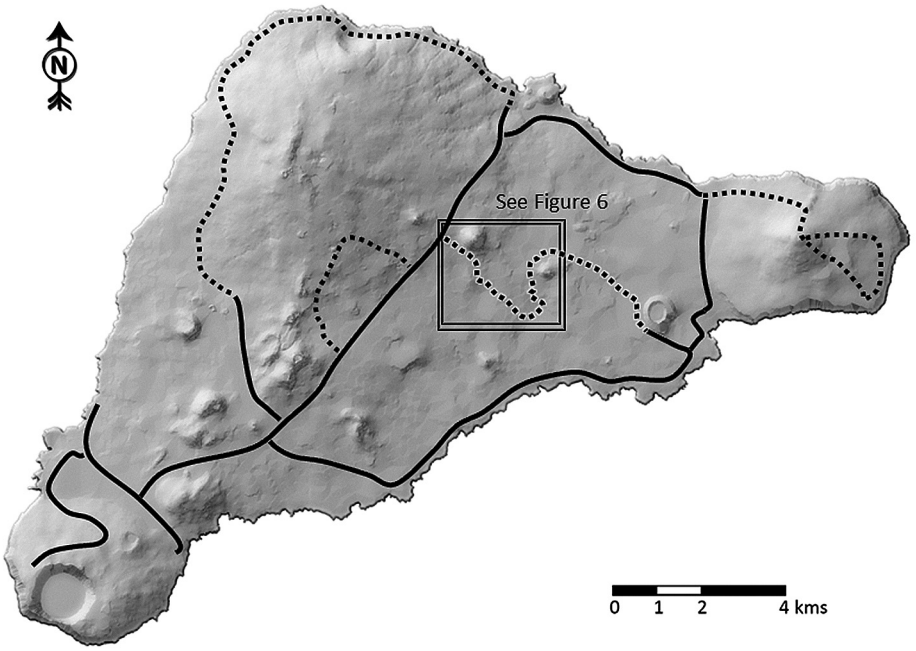

Fig. 5. Areas of the island visited by TAO students during the two-week campout: solid lines indicate tours in vehicles provided by Hotel Explora Rapa Nui; dashed lines indicate hiking tours led by TAO Director Dr. Britton Shepardson. For detail on inset, see Fig. 6.

Clearly, a significant amount of research remains before reaching a unified understanding of the past function(s) of *matā*. To date, there has been little collaborative discussion between archaeologists of what constitutes a reliable and holistic method to analyze the obsidian artifacts. And to make matters even more complicated, whether researchers have relied on a sample size of less than ten or more than 400, they have rarely provided useful and organized access to the images and/or metrics regarding the *matā* that fueled their conclusions.

While the students of TAO might not have enough experience as Pacific Island archaeologists to develop a robust and holistic methodology for *matā* analysis, they continue to develop a large comparative database of *matā* photographs, microscopic images, and measurements that could form the foundation for a number of archaeological research projects in the future.

Continuing with laboratory work that TAO students began in 2018, 209 students collected metrics and took photographs to thoroughly document 228 *matā* from MAPSE. As in the previous year, the documentation process included four stations. The stations include metric data collection, low-powered digital microscopic (20–200×) photography of edge damage on the dorsal and ventral surfaces, data entry into a Microsoft Excel spreadsheet, and finally, the bagging and tagging of each artifact. Each station had a minimum of two TAO researchers processing artifacts at a time. Artifacts that passed through all four stations were safely stored in the MAPSE collection warehouse. The results from two years of laboratory work are now publicly available in an online interactive database of 408 *matā* at www.terevaka.net/mataa.

Virtual Tour

TAO students launched an entirely new non-invasive digital access project in 2019 to develop an interactive virtual reality tour of the landscape and archaeological sites in the Maunga Pu'i–Ana Marama region of the island (see Figs. 5–7).

The goal of the project was not only to introduce students to a variety of technologies in photography, mapping, and web design, but also to carefully document cultural resources in the area that reside outside of the Rapa Nui National Park protected area, and to provide digital access to these cultural resources to demographics that might not have opportunities to hike the uneven terrain.

Upon establishing the roughly 5-km route, students systematically marked the route at every 50 m with a handheld GPS unit and photographs for detailed views along the route. Five photographs were taken, along with compass directions at each 50-m mark: forwards, ninety degrees to the east of forwards, backwards, ninety degrees west of forward, and directly upwards. For areas in which the route passed sites of archaeological interest, students employed three-dimensional orthogonally-corrected photogrammetry (3D OCP) to produce interactive digital models of each archaeological site. The 3D OCP technology required students to take photos of each feature or artifact from a variety of angles, in order to capture each natural face of the object from a distinct perspective. Students photographed objects with two types of cameras, a Canon EOS-6D DSLR body with a Canon EF 24–105 mm lens and a Canon EOS Rebel T6 DSLR body with a Canon EF 18–55 mm lens. Photographs were then imported to Agisoft Metashape Professional Edition software for post-processing and rendering of interactive three-dimensional digital models. The

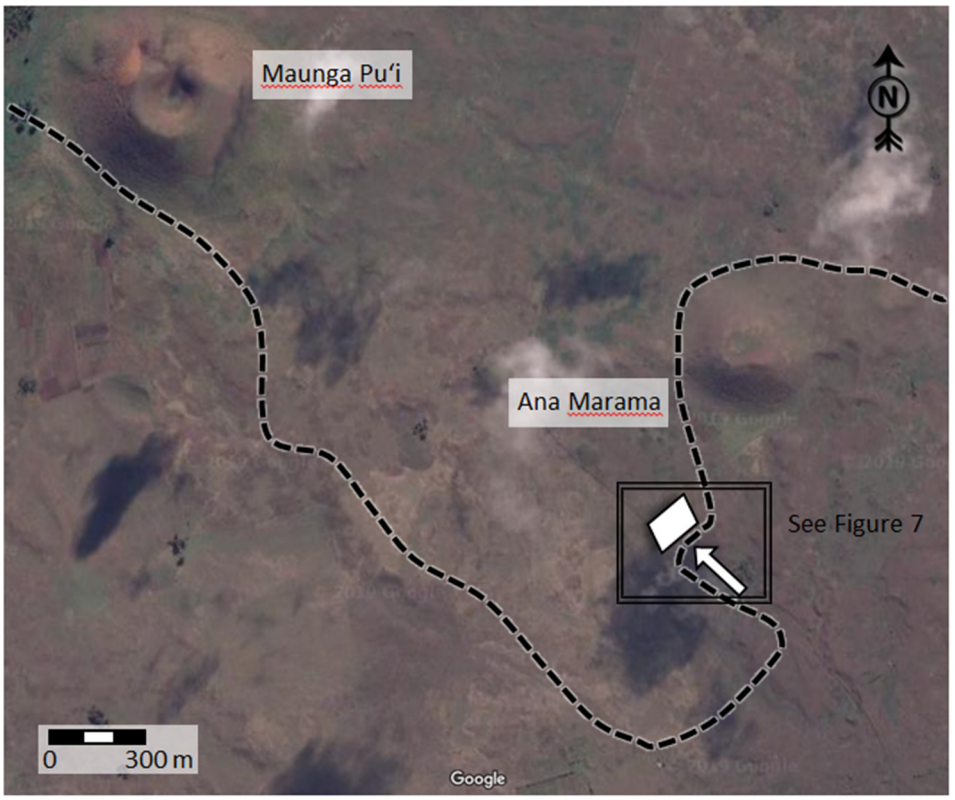

Fig. 6. Details of the virtual reality route designed by TAO students, www.terevaka.net/pui. Students marked every 50 m along the route with a handheld GPS unit and took five photographs (forward, right, backward, left, and upwards at each 50-m mark). Sites of archaeological interest along the route were photographed for three-dimensional digital modeling. For detail on inset, see Fig. 7.

resulting map, photographs, and models will be used to create an interactive website for a first-person exploration of the area and its cultural heritage (www.terevaka.net/pui).

Conclusions and Future Opportunities

More than sixty years after the first airplane flights reached Rapa Nui, the island community continues to thrive thanks to a tourist economy. At the same time, however, the struggle to keep up with the heavy demands of more than 100,000 tourists per year is more apparent than ever on the island. Legislation signed into action by Chilean President Piñera in 2018 has already begun to help in a crusade against overpopulation on the island, but the island environment and cultural resources are still at great risk.

TAO's mission and curriculum attempt to directly address some of the island community's hardships and empower local youths to develop new models for cultural conservation, non-invasive research, and digital access to cultural heritage. Our efforts will continue in 2020 with new island students, new curriculum and research projects, and collaborative efforts with island businesses, government institutions, and other non-governmental organizations.

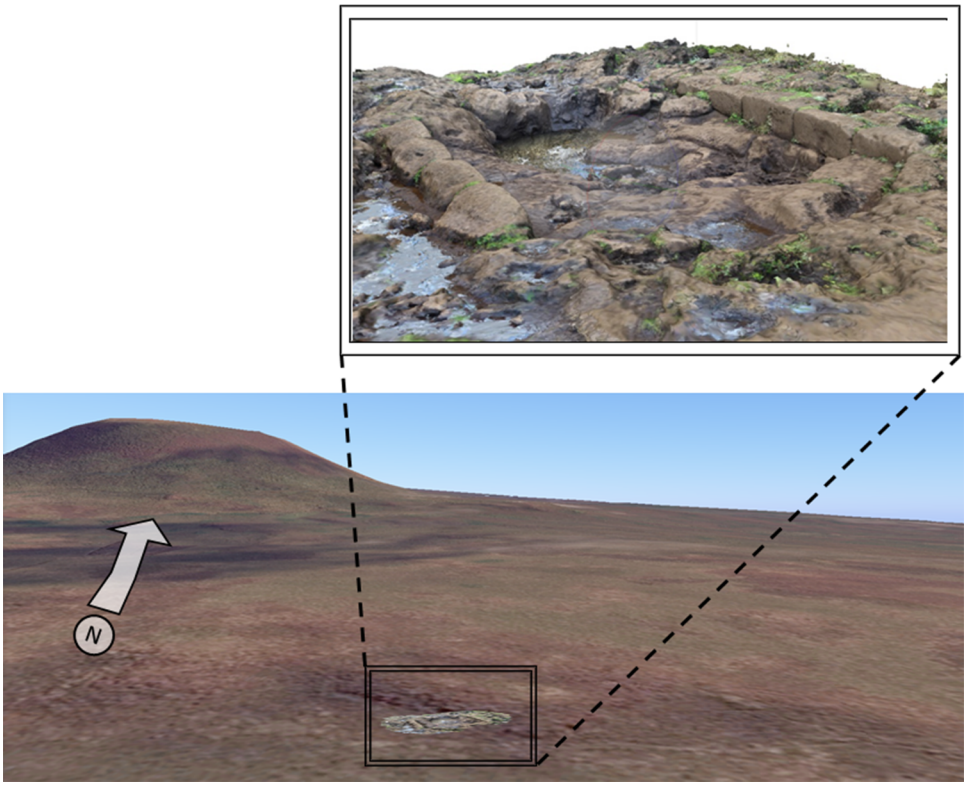

Fig. 7. The the virtual exploration view northward from the Ana Marama area, including a detailed three-dimensional digital model of a *puna* (an ancient water catchment system), with finely cut basalt *paenga* (slabs) fit precisely to island bedrock.

Table 1. Measurements and image records of *matā* generated for the MAPSE catalog by TAO 2019 students.

Catalog	Max. Length (mm)	Max. Width (mm)	Max. Depth (mm)	Weight (g)	Microscope Images	Camera Images
17-00-02023	49.06	50.92	11.55	19.25	2	2
17-00-02024	87.81	64.85	13.76	54.69	2	2
17-00-02025	66.94	81.57	15.48	52.46	1	2
17-00-02026	73.02	82.18	15.56	68.80	2	2
17-00-02027	87.55	87.14	18.08	83.00	2	2
17-00-02028	84.20	54.14	17.88	60.96	2	2
17-00-02029	63.97	75.50	15.80	59.68	2	2
17-00-02030	82.07	66.64	19.43	63.76	1	2
17-00-02031	78.13	72.77	17.97	76.80	2	2
17-00-02032	54.27	41.11	11.70	18.82	1	2
17-00-02033	70.39	72.72	21.76	68.69	1	2

Table 1 (*Continued*)

Catalog	Max. Length (mm)	Max. Width (mm)	Max. Depth (mm)	Weight (g)	Microscope Images	Camera Images
17-00-02034	61.64	62.18	9.64	36.45	1	2
17-00-02035	70.47	65.16	17.30	59.54	1	2
17-00-02036	7.14	47.02	12.25	31.90	1	2
17-00-02037	44.17	48.50	8.90	16.54	1	2
17-00-02038	33.78	27.04	11.94	13.91	1	2
17-00-02039	40.70	33.71	8.74	11.01	1	2
17-00-02040	57.10	77.03	16.13	42.39	2	2
17-00-02041	72.34	77.03	14.75	48.10	2	2
17-00-02042	74.77	65.33	20.88	43.41	2	2
17-00-02043	65.40	53.12	12.24	28.30	2	2
17-00-02044	99.87	54.20	23.44	91.77	2	2
17-00-02045	98.84	63.24	26.19	144.96	2	2
17-00-02046	39.96	65.70	6.40	4.16	2	2
17-00-02047	100.23	33.69	26.75	165.63	2	2
17-00-02048	78.88	70.64	12.45	62.38	2	2
17-00-02049	96.92	74.42	19.06	161.11	3	2
17-00-02050	55.39	108.48	13.81	27.63	1	2
17-00-02051	70.33	42.01	13.46	53.41	2	2
17-00-02052	55.03	63.86	18.27	51.59	3	2
17-00-02053	118.05	65.86	30.30	115.66	2	2
17-00-02054	63.10	59.25	17.62	39.80	2	2
17-00-02055	86.48	53.65	15.78	70.57	2	2
17-00-02056	50.93	86.42	15.38	36.63	1	2
17-00-02057	97.73	73.75	24.03	84.06	1	2
17-00-02058	50.25	49.27	11.15	16.24	2	2
17-00-02060	79.52	34.08	14.98	57.79	1	2
17-00-02061	16.98	64.90	3.94	1.00	1	2
17-00-02062	48.14	18.24	20.67	39.46	1	2
17-00-02063	47.48	57.48	19.23	49.22	1	2
17-00-02064	52.61	67.31	13.02	32.22	2	2
17-00-02065	29.87	59.67	8.86	10.45	1	2
17-00-02066	54.38	49.49	9.42	24.98	2	2
17-00-02067	51.90	48.19	19.04	44.48	2	2
17-00-02068	80.61	51.71	15.04	58.77	1	3
17-00-02069	62.67	67.55	22.30	57.36	3	2
17-00-02070	62.40	72.37	20.00	69.21	1	2
17-00-02071	79.76	75.80	15.05	74.57	2	2
17-00-02072	77.59	70.70	20.05	81.51	1	2
17-00-02073	72.11	65.09	13.40	51.10	1	2
17-00-02074	65.28	33.50	9.46	26.12	1	2

Table 1 (*Continued*)

Catalog	Max. Length (mm)	Max. Width (mm)	Max. Depth (mm)	Weight (g)	Microscope Images	Camera Images
17-00-02075	65.56	41.95	15.62	44.89	1	2
17-00-02076	56.06	14.99	15.92	19.23	1	2
17-00-02077	41.66	21.53	12.45	15.29	1	2
17-00-02078	47.74	36.52	13.02	23.42	1	2
17-00-02079	34.47	37.40	14.49	19.91	1	2
17-00-02080	54.40	35.34	14.64	22.68	1	2
17-00-02081	60.97	64.24	11.97	55.25	1	2
17-00-02082	72.33	67.93	16.56	56.33	1	2
17-00-02083	51.09	53.91	13.12	34.98	1	2
17-00-02084	91.52	72.93	16.76	85.22	1	2
17-00-02085	54.16	49.08	11.29	29.96	1	2
17-00-02086	33.96	61.52	13.35	26.62	1	2
17-00-02087	78.38	66.26	14.86	61.76	1	2
17-00-02088	51.09	50.60	14.93	36.89	1	2
17-00-02089	48.53	36.75	9.56	14.64	1	2
17-00-02090	46.47	34.90	12.41	18.05	1	2
17-00-02091	66.45	39.50	21.18	56.48	1	2
17-00-02092	38.83	42.47	9.32	13.36	1	2
17-00-02093	64.68	60.72	23.80	110.26	1	2
17-00-02094	61.34	37.81	12.09	28.45	1	2
00-00-02095	58.4	44.09	12.61	32.68	1	2
00-00-02096	47.07	38.75	9.63	14.58	1	2
00-00-02097	77.23	55.55	20.14	88.66	1	2
00-00-02098	88.66	50.89	12.34	43.78	1	2
00-00-02099	65.77	62.46	13.56	44.47	1	2
00-00-02100	98.77	65.21	16.63	80.16	1	2
00-00-02101	85.39	67.47	22.89	89.24	1	2
00-00-02102	76.35	43.10	16.93	48.80	1	2
00-00-02103	99.14	177.18	27.46	99.14	1	2
00-00-02104	78.01	88.93	11.68	79.00	1	2
00-00-02105	92.49	58.93	18.39	83.53	1	2
00-00-02106	69.50	48.65	9.75	32.02	1	2
00-00-02107	51.38	50.12	15.88	37.25	1	2
00-00-02108	83.31	89.39	2.40	87.94	1	2
00-00-02109	63.15	33.88	2.19	44.45	2	2
00-00-02110	50.07	29.78	7.46	22.53	1	2
00-00-02111	56.38	31.47	4.55	36.80	1	2
00-00-02112	73.37	53.36	5.91	95.91	1	2
00-00-02113	82.53	74.83	13.99	180.28	1	2
00-00-02114	54.13	35.01	1.96	34.42	1	2

Table 1 (*Continued*)

Catalog	Max. Length (mm)	Max. Width (mm)	Max. Depth (mm)	Weight (g)	Microscope Images	Camera Images
00-00-02115	90.60	69.63	15.27	56.51	2	2
00-00-02116	64.22	55.53	10.92	28.56	1	2
00-00-02117	64.48	60.41	15.97	34.81	2	2
00-00-02118	68.22	66.20	15.82	54.46	1	2
00-00-02119	117.74	74.57	15.97	98.00	2	2
00-00-02120	76.03	78.19	14.39	67.40	1	2
00-00-02121	55.48	50.85	7.94	16.48	2	2
00-00-02122	77.44	46.41	14.13	37.79	1	2
00-00-02123	91.63	73.38	20.66	155.60	1	2
00-00-02124	62.16	46.68	14.91	39.24	1	2
00-00-02125	72.93	60.08	16.37	47.94	1	2
00-00-02126	88.71	66.32	15.52	56.29	1	2
00-00-02127	64.29	68.84	15.49	48.03	1	2
00-00-02128	63.52	42.09	8.37	20.71	1	2
00-00-02129	72.79	51.11	16.76	37.96	1	2
00-00-02130	74.14	92.70	23.66	85.63	2	2
00-00-02131	45.90	9.32	34.35	19.59	2	2
00-00-02132	85.89	91.96	140.66	44.79	2	2
00-00-02133	76.85	81.20	144.32	42.86	2	2
00-00-02134	76.83	45.34	19.60	72.53	2	2
00-00-02135	66.85	70.06	13.35	47.47	2	2
00-00-02136	79.74	76.37	16.47	66.05	2	2
00-00-02137	85.60	34.67	12.49	34.98	2	2
00-00-02138	88.80	83.56	18.69	83.85	2	2
00-00-02139	73.79	72.27	13.11	56.12	2	2
00-00-02140	76.00	78.18	13.91	88.95	2	2
00-00-02141	72.45	49.98	11.99	30.19	2	2
00-00-02142	66.70	69.52	17.60	55.41	2	2
00-00-02143	87.56	62.35	20.24	83.77	2	2
00-00-02144	64.85	74.43	18.41	58.22	2	2
00-00-02145	63.64	75.90	15.70	54.87	2	2
00-00-02146	60.15	37.16	21.74	63.84	2	2
00-00-02147	64.47	71.27	13.47	48.40	2	2
00-00-02148	61.49	59.30	15.62	38.89	2	2
00-00-02149	73.65	63.05	21.04	81.78	2	2
00-00-02150	76.82	81.17	17.31	80.81		2
00-00-02151	82.69	66.99	15.81	55.91	2	2
00-00-02152	74.08	67.33	15.33	50.55	2	2
00-00-02153	66.99	47.20	8.33	29.42	2	2
00-00-02154	77.91	57.81	17.81	12.42	2	2

Table 1 (*Continued*)

Catalog	Max. Length (mm)	Max. Width (mm)	Max. Depth (mm)	Weight (g)	Microscope Images	Camera Images
00-00-02155	70.64	65.57	14.10	3.66	2	2
00-00-02156	96.22	84.54	25.16	78.75	2	2
00-00-02158	59.30	69.15	11.84	9.98	2	2
00-00-02159	114.23	107.97	24.53	191.13	2	2
00-00-02160	89.95	85.51	18.84	75.15	2	2
00-00-02161	88.81	76.79	19.59	81.58	2	2
00-00-02162	77.33	79.48	29.51	97.96	2	2
00-00-02163	58.62	55.39	14.08	37.01	2	2
00-00-02164	73.83	57.46	20.37	57.49	2	2
00-00-02165	63.63	44.60	9.77	25.71	2	2
00-00-02166	94.44	80.20	17.22	86.02	2	2
00-00-02167	73.23	62.92	16.77	48.11	2	2
00-00-02168	58.53	57.86	92.90	22.82	2	2
00-00-02169	73.29	54.80	16.28	51.89	2	2
00-00-02170	67.37	42.65	13.90	30.66	2	2
00-00-02171	53.07	65.65	14.30	50.53	2	2
00-00-02172	51.15	38.64	11.43	15.92	2	2
00-00-02173	51.76	45.92	14.78	26.30	2	2
00-00-02174	69.05	75.23	15.25	58.59	2	2
00-00-02175	53.43	44.08	10.03	20.23	2	2
00-00-02176	93.74	89.43	24.11	136.40	2	3
00-00-02177	64.87	63.83	17.55	57.14	2	2
00-00-02178	62.56	64.10	13.97	46.14	2	2
00-00-02179	53.05	55.62	10.21	41.83	2	2
00-00-02180	80.44	82.50	19.73	81.07	2	2
00-00-02181	57.89	44.56	12.90	21.70	2	2
00-00-02182	106.28	94.42	39.66	324.32	2	3
00-00-02183	86.12	88.93	19.53	113.91	2	2
00-00-02184	62.91	38.11	13.44	22.50	2	2
00-00-02185	68.49	67.51	16.25	47.86	2	2
00-00-02186	97.03	57.62	17.62	15.02	2	2
00-00-02187	90.44	63.29	15.52	62.09	2	2
00-00-02188	68.31	61.39	14.44	47.58	2	3
00-00-02189	57.56	75.58	21.73	62.82	2	2
00-00-02190	77.36	81.18	16.49	68.54	2	2
00-00-02191	68.20	57.44	24.33	79.73	2	2
00-00-02192	78.86	59.21	34.02	81.51	2	2
00-00-02193	4.48	1.45	45.91	31.29	2	2
00-00-02194	64.05	52.80	11.32	26.63	2	2
00-00-02195	56.88	51.24	10.67	21.39	2	2
00-00-02196	62.14	68.02	20.06	51.28	2	2

Table 1 (*Continued*)

Catalog	Max. Length (mm)	Max. Width (mm)	Max. Depth (mm)	Weight (g)	Microscope Images	Camera Images
00-00-02197	68.48	68.81	21.04	56.14	2	2
00-00-02198	91.32	50.31	14.65	48.42	2	2
00-00-02199	59.55	62.28	17.72	38.01	2	2
00-00-02200	62.63	44.94	14.44	28.92	2	2
00-00-02201	78.89	74.61	17.77	43.35	2	2
00-00-02202	90.44	48.25	17.05	61.61	2	2
00-00-02203	51.44	81.26	15.16	42.79	2	2
00-00-02204	70.55	79.35	17.24	57.51	2	2
00-00-02205	60.40	68.04	11.81	35.46	2	2
00-00-02206	51.14	75.20	14.80	55.02	2	2
00-00-02207	62.26	62.45	14.87	43.61	2	2
00-00-02208	71.29	51.16	20.05	56.28	2	2
00-00-02209	69.52	63.85	13.06	41.40	2	2
00-00-02210	72.92	88.72	18.89	63.93	2	2
00-00-02211	43.57	77.76	10.38	24.94	2	2
00-00-02212	54.45	59.34	16.57	38.60	2	2
00-00-02213	9.06	87.36	18.10	98.65	2	2
00-00-02214	65.35	74.19	12.58	47.46	2	2
00-00-02215	48.38	45.57	14.68	23.10	2	2
00-00-02216	66.89	56.77	13.34	45.59	2	2
00-00-02217	87.88	69.63	12.63	66.93	10	2
00-00-02218	73.12	59.60	14.90	45.5	2	2
00-00-02219	51.76	51.35	7.38	17.20	2	2
00-00-02220	103.08	52.30	16.15	67.96	2	2
00-00-02221	51.80	44.27	9.26	20.50	2	2
00-00-02222	59.66	52.00	10.46	21.90	2	2
00-00-02223	73.54	57.00	13.40	40.25	2	2
00-00-02224	73.95	62.84	21.39	62.18	2	2
00-00-02226	71.81	48.54	14.86	36.20	2	2
00-00-02265	86.91	62.20	16.80	54.62	2	2
00-00-02266	87.06	51.89	16.44	55.83	3	2
00-00-02267	77.21	52.46	12.18	38.34	2	2
00-00-02268	80.68	45.68	16.10	45.68	2	2
00-00-02269	62.52	41.81	15.43	27.94	2	2
00-00-02270	64.82	36.91	12.75	21.63	2	2
00-00-02271	71.71	52.58	18.89	48.70	2	2
00-00-02272	74.10	72.41	13.51	61.15	2	2
00-00-02273	74.29	67.56	17.46	66.22	3	2
00-00-02274	78.74	66.28	17.56	58.44	2	2
00-00-02275	70.81	72.33	15.06	53.73	2	2
00-00-02276	77.78	75.31	12.60	39.88	2	2

Table 1 (*Continued*)

Catalog	Max. Length (mm)	Max. Width (mm)	Max. Depth (mm)	Weight (g)	Microscope Images	Camera Images
00-00-02277	59.87	38.29	9.06	18.05	2	2
00-00-02278	67.04	64.41	11.64	29.92	2	2
00-00-02279	65.79	54.22	11.64	29.59	3	2
00-00-02280	80.64	75.09	14.60	79.09	2	2
00-00-02281	65.66	48.86	13.62	37.52	2	2
00-00-02282	81.24	61.03	15.80	49.71	3	2
00-00-02283	98.59	68.32	22.30	104.24	2	2
00-00-02284	92.34	53.22	16.41	65.22	3	2
00-00-02285	91.56	78.22	18.20	76.07	2	2
00-00-02286	65.98	56.02	11.81	36.16	2	2
00-00-02287	89.56	88.45	15.35	98.37	2	2
00-00-02288	65.79	46.51	11.89	27.72	2	2
00-00-02289	60.54	63.70	12.07	32.60	3	2
00-00-02290	48.70	53.16	12.40	27.50	3	2
00-00-02291	57.88	59.62	13.14	35.48	2	2

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