trace elements detected above plus Zn. Quantitative chemical analysis performed with an LA-ICP-MS system recorded 0.26–0.51 wt.% CuO and 0.03–0.40 wt.% MnO in the blue tourmalines. Significantly greater amounts of these elements were found in the blue-green samples: 2.08–3.21 wt.% CuO and 3.55–4.81 wt.% MnO. Additional trace-element data on these new tourmalines, including a comparison to Cu- and Mn-bearing tourmalines from other localities, will be reported in a future article.

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SYNTHETICS AND SIMULANTS

Lizard in amber? A private collector brought an impressive sample of what appeared to be a well-preserved lizard in yellow amber (figure 25) to the SSEF Swiss Gemmological Institute for identification. The piece, which measured 15 × 8 × 2.5 cm and weighed 196 g, looked almost too good to be true: The reptile was in excellent condition, and its scales were still green and sharply defined. The top of the sample was polished with a domed surface, while the bottom was rough and chipped.

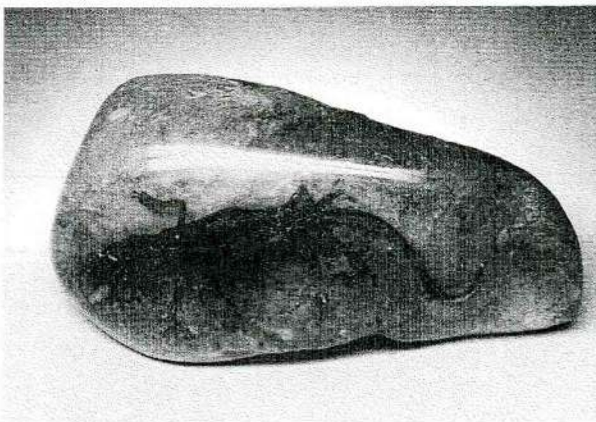


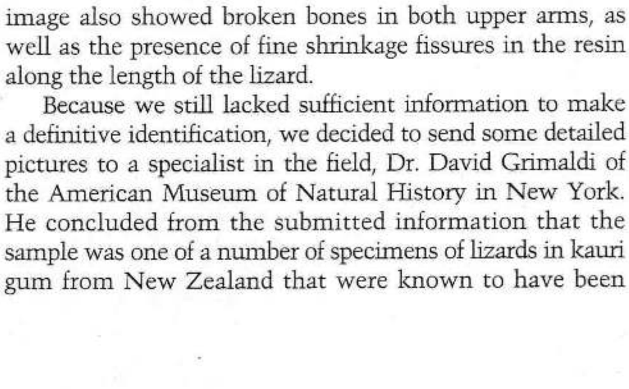
Figure 25. This most unusual sample (15 × 8 × 2.5 cm) proved to consist of a modern lizard that was artificially embedded in a natural resin. Photo by H. A. Hänni; © SSEF.

The characterization of such an item requires identification of the resin and confirmation that the sample was not assembled or otherwise created artificially. The rough bottom surface made it easy to remove a minute amount of the material for an FTIR powder spectrum (KBr pellet method), which was performed by Dr. Stefan Graeser of the Mineralogical-Petrographic Institute at Basel University. While the recorded spectrum was consistent with a natural resin, unfortunately it did not allow discrimination between the three possibilities: amber, copal, and kauri gum. When the sample was rubbed with a piece of fabric, a strong aromatic smell was produced. This ruled out amber, since the material clearly contained unevaporated volatiles. Further rubbing with a cotton swab dipped in ether had no effect on the sample; this ruled out copal, which would have dissolved slightly.

For comparison with a known specimen of lizard in amber, we contacted the Natural History Museum of Basel and were given permission to examine a well-known *Anolis* lizard in Dominican amber (see E. J. Gübelin and J. I. Koivula, *Photoatlas of Inclusions in Gemstones*, ABC Edition, Zurich, 1986, p. 227). This sample displayed clear anomalous double refraction between crossed polarizers (figure 26), whereas the client's piece showed no strain in the material, around either the lizard or the numerous bubbles. Magnification revealed that the feet of the museum's reptile were dark brown and almost dissolved, while delicate features in the feet of the client's lizard were still intact (figure 27). X-radiography also produced some interesting results: While the *Anolis* lizard had only a weak skeletal outline, the bones and even soft tissue of the client's lizard were clear and sharp (figure 28). The latter image also showed broken bones in both upper arms, as well as the presence of fine shrinkage fissures in the resin along the length of the lizard.

Because we still lacked sufficient information to make a definitive identification, we decided to send some detailed pictures to a specialist in the field, Dr. David Grimaldi of the American Museum of Natural History in New York. He concluded from the submitted information that the sample was one of a number of specimens of lizards in kauri gum from New Zealand that were known to have been

Figure 26. For comparison with the sample in figure 25, we examined a well-known specimen (7.1 cm long) of a lizard in amber from the Museum of Natural History in Basel. Observation of this sample between crossed polarizers revealed the strong anomalous double refraction that is typically seen around inclusions in true amber. This reaction was not present in the manufactured sample. Photo by H. A. Hänni; © SSEF.



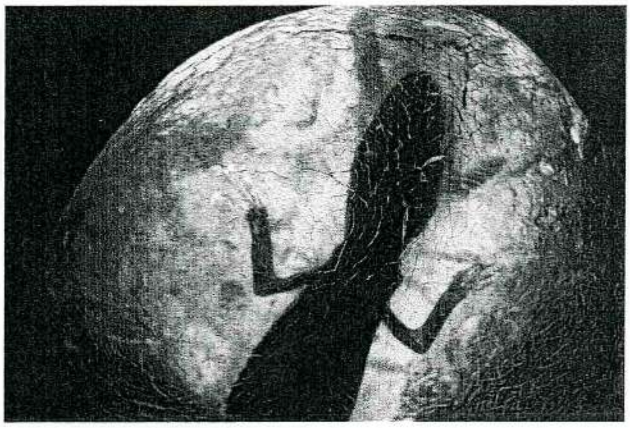


Figure 27. Delicate features are preserved in the feet of the lizard in the manufactured specimen. This degree of preservation was not seen in the museum's reference specimen. Photo by H. A. Hänni; © SSEF.

manufactured at the beginning of the 20th century and subsequently mounted for display by naturalists. The surface of the sample had evidently aged enough so that no reaction occurred when it was rubbed with a cotton swab dipped in ether. We reported to the client that this was a modern lizard artificially embedded in a recent natural resin.

HAH

Cubic ziconia as rough sapphire imitation. Recently, a 38.44 g dark blue "pebble" was submitted to the AGTA laboratory for identification. It had been purchased in Africa by missionaries, and the client wanted to know if it was a sapphire or a tanzanite.

Figure 28. An X-radiograph of the manufactured sample produced a clear, sharp image of the lizard's skeleton, as shown here. By comparison, the fossilized lizard in the museum's specimen showed only a weak skeletal outline. Image by H. A. Hänni; © SSEF.

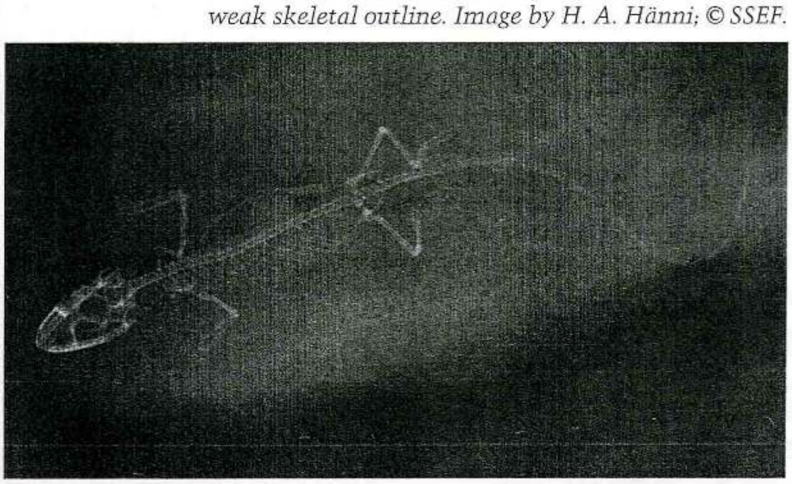


Figure 29. Though presenting a convincing appearance as a pebble of sapphire or tanzanite, this sample (34 × 21 × 20 mm) proved to be manufactured from cubic zirconia. Photo by Min Htut.

The sample superficially resembled waterworn gem rough. As can be seen in figure 29, its surface was covered with pits and grooves that were filled with a yellowish brown soil-like substance, making it appear very dark. Only with transmitted light was the transparent blue nature of the sample apparent. Because there was no polished surface, a refractive index could not be taken.

When the piece was exposed to long-wave UV radiation, we observed a strong green reaction, which excluded both sapphire and tanzanite. In short-wave UV, the stone displayed a weak chalky white fluorescence. The rough surface made it difficult to look inside the sample for inclusions, and only a few fractures could be seen.

Chemical analysis with EDXRF showed Zr and Y with minor Hf, Fe, Cl, K, and Ca, but no Al or Si as would be expected in a natural stone. A Raman spectrum confirmed that this unusual fake was manufactured from cubic zirconia.

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Barium-rich glass sold as diamond rough. Recently a parcel of what was represented as octahedral diamond rough was submitted to the GIA Gem Tech Lab for identification. All of the material was pale yellow except for one colorless piece. This 1.53 ct rounded octahedron also caught our attention because of the condition of its edges, which had a granular appearance (figure 30) unlike anything we had previously seen on diamond rough. No inclusions were visible in this octahedron at 10× magnification or when it was examined in immersion at higher magnification.

The octahedron showed strong blue fluorescence to long-wave UV radiation (figure 31) and moderate blue fluorescence to short-wave UV. This reaction was similar to that seen in some natural diamonds. However, when this piece was examined between crossed polarizers, we observed a cross-like strain pattern (figure 32), which is