

“SYNTHETIC”

By James Evans, EG

By the end of the 19th century, ruby stood alone as the only precious stone to have succumbed to the ingenuity of chemists. The gem could now be manufactured in a laboratory. But how should these newly-manufactured stones be described?

The most authoritative text on the subject of gemstones was, at this point, Max Bauer’s *Edelsteinkunde* (‘Gemmology’). Bauer described manufactured rubies as ‘artificial’ – taking his lead from the French *Chambre syndicale des négociants en diamants, perles, pierres précieuses et des lapidaires*. This group of established French jewellers imposed their preference on the public in 1886, under threat of the penal code (Kunz, 1886, p.8). Their hand was forced by the emergence of a new manufactured ruby that was large, transparent, and a beautiful “pigeon-blood” red. This gem was ‘Geneva Ruby’.

Despite the guild’s proclamation, we can see from Julius Wodiska’s *Book of Precious Stones*, published in 1909, that manufactured gems were still variously described as: ‘artificial’, ‘laboratory’, ‘synthetic’, or even ‘reconstructed’ (where the stone was fused from chips of natural ruby). Wodiska’s own preference was for the term ‘scientific’.



A boule of ‘Geneva Ruby’¹

Another significant text was George Herbert Smith’s *Gemstones* (first published in 1912). The influence of this book arose from the author’s appointment as Principal Examiner for the UK National Association of Goldsmiths’ new ‘Gemmology Diploma’. With the first exams held in 1913, it was no surprise that students regarded the examiner’s textbook as their gemmological “bible” (Anderson, 1973, p.236). The term Herbert Smith used in this book was ‘manufactured’.

In summary, the most popular term for manufactured gems was, at first, ‘artificial’, with alternatives including: ‘laboratory’, ‘synthetic’, ‘reconstructed’, ‘scientific’, and ‘manufactured’.

The battle between 'artificial' and 'synthetic'

Which term was best? Hermann Michel described, in 1914, how numerous jewellers, dealers, and chambers of commerce all advocated for the term 'artificial'. The producers of manufactured stones, meanwhile, opted for 'synthetic'. They argued that the term 'artificial' unfairly implied 'imitation', for neither 'artificial silk' nor 'artificial leather' was actually silk or leather. Chemists and mineralogists similarly supported 'synthetic'. But Michel concluded that, *'since it is precisely the scientific circles that have the slightest interest in how the artificial gemstones are to be named in the trade, the scientific point of view on this question can be pushed to the background'* (Michel, 1914, pp.97-98).

In Michel's view, the only reasonable solution was to mandate the term 'artificial'. However, to out-law a term with greater scientific merit, for the benefit of established industry, was clearly protectionist (justified, as always, by a desire to protect consumers).

The battle between 'artificial' and 'synthetic' was finally settled in 1940. It was at this point that George Herbert Smith released the ninth edition of *Gemstones*, marking the first time his "bible" was substantially rewritten. His former chapter on 'manufactured' stones was now relabelled as 'synthetic'. Meanwhile, references to 'synthetic gems' finally overtook those for 'artificial gems', when viewed across all English publications (Google Books Ngram Viewer).

By applying a standard profit margin across its departments, Sears became the largest jewellery store in the world – so big that it pulled the global jewellery industry towards it, whilst claiming that its *'small margin of profit'* was responsibility for *'a wonderful change in method in the jewelry business'*.³ By the 1940s, the company's advertising guide explained that: *"synthetic" may be used to describe gems produced by artificial means and having essentially the same physical, chemical, and optical properties as [...] natural gem stones'*.⁴

In France, a decree passed in 1968 would latterly ban all terms other than 'synthétique' or 'artificiel', with a 2002 update further restricting the choice to 'synthétique' or 'de synthèse' (France, 1968, 2002). Despite numerous industry protestations and bans, the term 'synthetic' had gradually won out over 'artificial'.



Workers in the jewellery department of Sears, Roebuck & Co., Chicago.² It was Sears' policy to bring the luxuries of life to those of modest circumstances (i.e. the expanding U.S. middle class).

The wider debate

What had prompted Herbert Smith to rewrite his textbook in 1940? It was perhaps no coincidence that a new book had been published in 1936, by Herbert Smith's long-standing colleague at the Natural History Museum: Leonard Spencer. Spencer had headed the museum's Mineralogy Department since 1927, with a particular focus on labelling and cataloguing the collections. Having retired from his position in 1935, Spencer was free to advocate a radically different approach to terminology, in a manner both scientifically robust and eloquent:

The operations of the chemist are strictly analogous to those of a gardener, but nobody would suggest that products of the latter are "artificial" cabbages or roses. They may be cultivated, like "cultured" pearls and gentlemen. Adjectives are apt to get a little mixed when applied to different nouns. We may talk of wild roses and tame rabbits, but not of wild rubies and tame rubies; of artificial rubies, but not of artificial babies. "Artificial" flowers and eyes are made artificially, but they are neither flowers nor eyes. But rubies produced by the intervention of man are real, just as much as are babies. Like Topsy they have just growed. Even Topsy must have had a father to initiate the process.

Neither is the adjective "synthetic" quite a happy one in this connexion. The artificial production of ruby is not one of synthesis by the combination of aluminium and oxygen. The material used is alum, and the process is rather one of breaking down, or analysis. Synthetic rubies are often mentioned, but never analytic rubies. Although gold is produced artificially from gold ore, we do not talk of synthetic gold or artificial gold. Mineralogists, however, distinguish "native gold"; and in this sense we may speak of native ruby. Then the "artificial" products could be called just gold or ruby. (Spencer, 1936, p.101).

Spencer hereby pointed out that manufactured ruby is not the result of chemical synthesis: It is not, strictly, synthetic. The same point applies to CVD diamond today. The skill required to synthesize an element from its sub-atomic particles would be prodigious. What actually happens when producing these diamonds, is that carbon atoms are torn from molecules of methane. In modern terms, it is decomposition, not synthesis. Should we therefore talk of 'decomposed' diamond, rather than 'synthetic' diamonds? In a word, yes – though Spencer's further suggestion, to remove the adjective entirely, seems more likely (especially in light of the U.S. Federal Trade Commission's 2018 decision that manufactured diamonds are, indeed, diamonds).

The contemporary debate on diamond marketing sees the now orthodox term of ‘synthetic’ being increasingly superseded by ‘lab-grown’. This move is championed by the diamond manufacturers of India – where the term ‘synthetic’ is considered to be as misleading today as ‘artificial’ was in the 20th century. Meanwhile, France is again supporting the established industry – mandating the use of their current preferred term (‘synthetic’).

Despite the French regulations, the chances of the established industry forcing their preference on the wider market are no greater today than they were a century ago. But the lesson to be drawn from the 20th century battle is, perhaps, that the greater threat was never really from marketing, but was inherent in the inflated profits abhorred by a growing middle class.

Notes

¹ Image by Kurt Nassau, 1980.

² Image by Sears, Roebuck and Company, ca. 1906.

³ Quote from Sears, Roebuck and Company, ca. 1906.

⁴ Quote from Sears, Roebuck and Company, 1942.

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