Beauty was the topic tackled by the participants at the 12th Berlin Colloquium of the Gottlieb Daimler and Karl Benz Foundation. “Is beauty measurable?” was the question explored by art historians, scholars of literature and music, car designers, mathematicians and lawyers under the direction of Wolfgang Klein, Director of the Max Planck Institute for Psycholinguistics.

Aesthetic value judgments are relative – the example of Botticelli’s Venus and the Venus of Willendorf from the Paleolithic Age makes this all too clear. Both embody the ideal of beauty of their times, but do not necessarily meet modern ideals.

Beauty Beyond Measure

Art lovers generally consider Botticelli’s Venus to be beautiful. However, opinions differ considerably when it comes to other works of art, as aesthetic judgments can be at odds with each other. Value judgments vary from person to person, and are bound to fashions and eras, which may explain why they seem to persistently elude sound scientific analysis. “It is no coincidence that science shies away from matters concerning values and value judgments,” said Wolfgang Klein, Director at the Max Planck Institute for Psycholinguistics, who chaired the conference on the question of whether beauty is measurable. “A colloquium like this is an excellent opportunity to examine this issue.”
In addressing the question of the measurement of beauty, the Berlin-based gathering of experts that met at the Academy of the Konrad Adenauer Foundation was in very good company and in keeping with a long and fine tradition. The search for the formula of beauty pervades the cultural history of man. Since ancient times, philosophers and artists have endeavored to solve this mystery using numbers, units of measurement and proportional ratios. Time and again they came up with the ideal ratio of proportions, only to discard them again later.

Michelangelo’s David, Beethoven’s piano sonata Appassionata and Rilke’s poem The Panther are three different forms of beauty. Scientists want to know what principle is inherent to all three and gives them such great artistic merit.

However, there are now very different motives for the search, as the issues raised in Berlin reveal: for example, how does a car designer go about attracting buyers to his vehicle? How does a leading judge pass a verdict on the artistic merit of a court case? How does a cosmetic surgeon with formulas for designing beautiful faces? What distinguishes the beautiful sections in a piece of music?

In many ways, related to the interplay between man, the environment and technology – the foundation’s presupposed main area of interest for more than 20 years. “The more we know about what lies at the heart of these aesthetic consequences, the stronger the impact on the shaping of our environment through architecture, town planning, landscaping and product design.”

According to Gisbert Freiherr zu Putlitz, colloquium host and President of the Gottlieb Daimler and Carl Benz Foundation, “there’s a direct relationship between beauty and sales volume” – a good reason to get to the bottom of the fundamental unresolved question of aesthetics. Beyond this, however, the question of beauty and its measurability is, in many ways, related to the interplay between man, the environment and technology – the foundation’s presupposed main area of interest for more than 20 years. “The more we know about the fundamental unresolved question of aesthetics.”

However practical a general standard for beauty might be, and despite great endeavor, no satisfactory result has yet been produced as a generally applicable, timeless beauty formula. The golden ratio, body mass index and 90-60-90 (36-24-36) as the male figure are fine efforts in this respect, but they do not hold as normative specifications.

Max Planck researcher Wolfgang Klein believes that the failure to find the standard of beauty is not because this formula does not exist, but rather strictly because the right approach has not been used. “What has been lacking so far is an empirical analysis of aesthetic properties – that is, the search for arguments that establish an object’s aesthetic value scientifically – just as with physical laws that govern other natural phenomena.”

As an example, he cited the study of literature, which deals, among other things, with works that many consider beautiful. Goethe’s Faust and Rilke’s The Panther are typical examples. “I have often thought about how empirically proven methods could be used to tackle the problems of aesthetics – whether in literature or other forms of expression. I think there are a lot of possibilities here,” says Klein.

But in order to fathom the design principle of beauty, the humanities must “see how the principles apply,” says Klein. “They usually focus on great and complex works,” explained Wolfgang Klein. “Here, however, you have to begin small and not try to immediately explain why Goethe’s Marienbad Elegy, Beethoven’s piano sonata Appassionata or Rembrandt’s Night Watch are considered beautiful by scores of people, but not by all.”

Courage to Take the Long Road to Knowledge

Using the simplest possible texts, sound sequences and forms, one must “see how the principles apply.” However, this method, as with any empirical science that deals with variable occurrences, is “labious, tedious and dull” – and thus exactly what “many scholars and academics working in the humanities do not like doing,” says Klein. “But this is the only way to establish which factors and rules deter-
mine our aesthetic judgment.” This requires that scholars in the arts have the “courage to take the long road to knowledge.”

Ulrich Konrad from the Institute of Music at the University of Würzburg showed what form this empirical approach might take in the humanities using short extracts from Verdi’s La Traviata. He painstakingly analyzed the phenotype of the “beautiful sections” in the music, going over it bar by bar, and scrutinizing chords, metrically unstressed moments, strict regularity and other compositional elements of these sections that spark goose bumps – that is, that pleasant shower of emotion that manifests itself in an increased heart rate and changes in skin conductance that can be recorded with measuring equipment. Ultimately, however, even Ulrich Konrad was unable to explain what the mysterious formula of aesthetics might look like.

Klein claimed that empirical procedures were particularly well suited to imprecise or variable areas of research – and that is exactly what characterizes the aesthetic questions that he aims to address and resolve using the meticulousness of science. “It’s no coincidence that the phrase de gustibus non est disputandum – there’s no disputing taste – was often heard during discussions over whether something was beautiful or not.” He was referring here to the customary rhetorical restraint shown in controversial aesthetic matters. This contributes little to resolving the question in individual cases, but it does indicate something characteristic: the great relativity of opinions.

**Aesthetics in the Lab**

Beauty is also just one of many aesthetic qualities that may distinguish a work of art or an item of everyday use, and have a certain effect on the recipients. Klein wants to examine these relationships using empirical methods: “Using objectively defined methods, we have to attempt to explain why a text has a certain impact on people, also with objectively defined characteristics.”

Hans-Dieter Futschik was quick to agree that aesthetic evaluation involves a complex combination of individual factors. As Director of Design at Daimler AG, he is responsible for ensuring that drivers find the cars he designs attractive – and that they purchase them. “Why people find a car attractive can be explained by the interaction of various aesthetic qualities and other factors that go beyond the object’s form.”

To determine what appeals to potential customers, the Daimler designers rely on just these empirical aesthetics, using various measurement methods to analyze the emotional impact of cars. Futschik explained that the findings of design studies also play a part in automotive design. However, the most important impulses for them are the results obtained from car clinics – test laboratories where trial participants evaluate car models prior to market launch. “These judgments clearly depend on a number of different aesthetic and social characteristics of the car that have a subconscious effect on the observer,” said Futschik, summing up numerous test analyses. Most people react to car models in the same way they do to works of art – directly, intuitively and with clear value judgments, such as “I like it” or “I don’t like it.”

The formula for beauty, the implementation of which would inevitably trigger great enthusiasm in custom- ers, would be the Holy Grail – and not only for designers like Hans-Dieter Futschik. Countless others from various professional groups would know just how to put it to best use. For example, it would also be in great demand with lawyers, according to legal expert Haimo Schack from the University of Kiel during his presentation. “Passing judgment on beauty” has caused a real conundrum for some judges, who usually have the task of applying clearly defined norms to a case.

“The more clearly defined the legal norm, the lower the risk of individual judges’ subjective feelings influencing a ruling, and therefore bringing arbitrariness into the courtroom.” Significantly, words such as
“beautiful” and “beauty” do not appear as criteria in the wording of the law. Nevertheless, judges do sometimes still have to pass judgment on aesthetic issues, although they usually manage to avoid making aesthetic value judgments. For example, an object may have to be restored to its original condition after being damaged – irrespective of whether it was beautiful or ugly to begin with.

Works of fine art that are protected by copyright do not have to be beautiful in the eyes of the law, but simply individual and capable of stimulating the human senses in some way.

Measuring beauty is not that straightforward for mathematician Peter Deuflhard. The professor of scientific computing at the Free University of Berlin and head of the Berlin Zuse Institute is not searching for the most beautiful algorithms. Rather, he operates with numbers – almost literally, as one of his research groups provides support for oral and maxillofacial surgeons in planning surgery and determining the measurements for a well-proportioned face.

Before the surgeon starts to use his scalpel to correct a patient’s facial disfigurements, Deuflhard and his team calculate how the face might appear most attractive after the operation. To do this, for each patient, they must revisit the question of what constitutes a beautiful face. “Is the distribution principle of the golden ratio a code for facial beauty, or is it the seventh rule?” he asked, outlining some of the questions he has to consider. He has yet to find a formula that works for every patient, and continues his research. “I apply the knowledge of a mathematician and a physicist, and explore what the arts have to offer here.”

Frustration for the Mathematician

Peter Deuflhard’s aim is to establish a “catalog of criteria on which the planning of oral and maxillofacial surgery can be based.” However, nei-