The architecture of antiquity is substantially characterised by conventions associated with the orders (chiefly Doric, Ionic and Corinthian) and the most prevalent building types (temples, theatres, tombs and so on). In part due to the legacy of Vitruvius, Renaissance treatises, pattern books and Beaux-Arts teaching, in part due to modernist reactions to the same, it is commonly presumed that these conventions stifled creativity and reduced design to a formulaic process. In reality there was the latitude for considerable flexibility not only in the organization of ground plans and in the choice of elevational vocabulary (witness mixed and hybrid orders), but also in all aspects of the architectural project.

To understand the way ancient architects manipulated the shapes and spaces they created it is necessary to grasp certain fundamental principles that can be observed at least as far back as the classical period. These principles revolve around geometry and proportion, but they had little to do with the kind of ‘secrets’ that were so often championed in the 19th and 20th centuries, including the much vaunted golden section and notions such as ‘Dynamic Symmetry’. If such may be said to have existed, the secret of ancient design was its marriage of rule and variety. On the one hand it was indeed important that civic buildings and the orders with which they were dressed should belong to recognised conventions. But on the other hand diversity and novelty were equally in demand.

Whereas in the 18th and 19th centuries fairly close copies of buildings were fashionable (with versions of the Monument of Lysicrates for example being produced all over Europe and North America), in antiquity direct citation was exceptional. Notable examples are the reworkings of Mnesikles’ 5th century propylaea on the Athenian acropolis in the form of the propylaea built in the Roman agora and at the sanctuary of Demeter at Eleusis, the late first century B.C. and the first half
of the second century A.D. respectively. In both cases, however, the act of ‘copying’ was relatively flexible. Trajan’s Column famously provided the basis for the design of the Column of Marcus Aurelius, but while they share the same kind of helical relief and the same 100 ft height for the columns themselves (excluding pedestals and statues), there are also extensive differences (Wilson Jones [1] chapter 8). Even in the design of the Greek Doric temple, arguably the most consistent of all ancient building types, the modular-proportional methods employed did not equate to mere mechanical reproduction. In my view the Greeks used a modular-proportional method based on a module equivalent to the width of the triglyph, a method that was to find a later echo in the writings of Vitruvius (Wilson Jones [2, 3]). Different temples can look so similar to modern eyes because we are not attuned to the fine level of variation and adjustment that permeated each exemplar.

So how did ancient architects mediate between the apparently conflicting polarities of rule and variety? Although Vitruvius does mention the need on occasion to bend the rules according to circumstance, he did not discuss this question in anything like a systematic manner. Nor was it properly resolved in the Renaissance or subsequently; indeed commentators on ancient architectural design never really succeeded in going beyond Claude Perrault’s findings of the late 17th century to the effect that Roman monuments display too much variety ever to have been the product of agreed methods.

But Roman architects (and their Greek forebears) did use methods. Of course they did, otherwise it would be impossible to explain the conformity in appearance that is no less incontrovertible than the variations. This point is also confirmed by analyses of ancient design practice such as those by Coulton [4, 5], along with collected essays on this theme [6, 7]. In order to understand the way in which the methods used were able to admit variation, I propose focusing on the design of the Corinthian capital, the swelling of column shafts known as entasis, and the layout of amphitheatres. Each are pertinent to the theme of this volume by virtue of the curving shapes they involve.

**The Corinthian capital**

After centuries of development and experimentation on Greek territory, around the time of Augustus Roman architects privileged a single morphology, often known as the ‘Normalkapitell’ following in particular