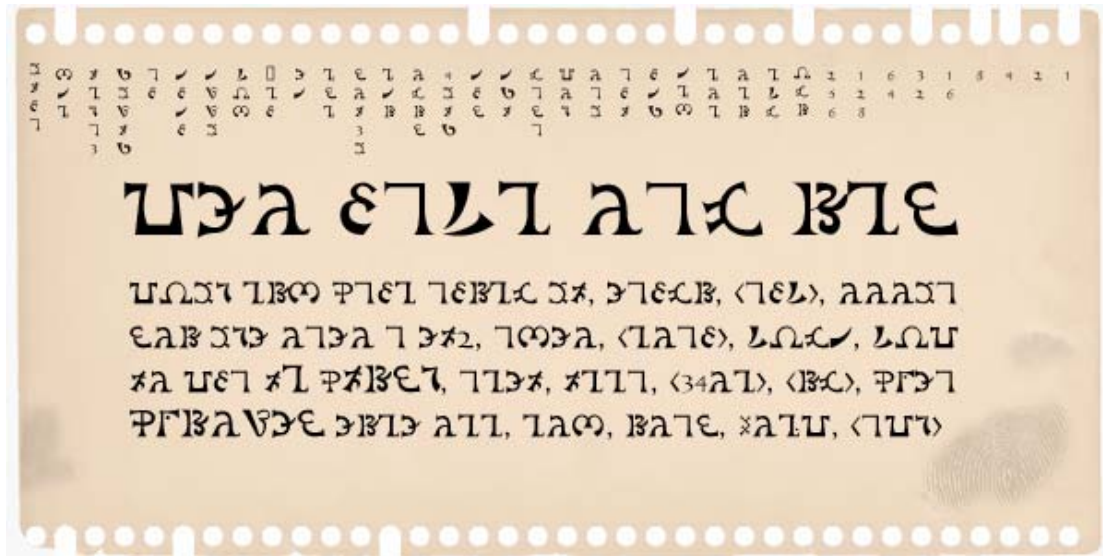


## Technology



Xanthe boasts that it is the technologically most advanced culture on Mars, which is at least partially true. Its citizens in the core of the empire enjoy on average the highest material standard available, and the empire has enabled widespread adoption of many technologies that are too expensive elsewhere.

Sailplanes have been used among the Margaritifer islands for ages, but the Empire has encouraged the development of far more advanced designs. Plastic has enabled planes that can stay aloft far longer, powered by pedalling. These cycleplanes have become the most common method of couriers and small goods across the Empire, and are imitated widely in the Marineris region.

### Plastic kelp farms

The most important technology for the empire is bioplastic and its relatives. It is produced by fermenting kelp (which also produces methane for light and heating) with specially engineered bacteria. The soup is treated, producing various kinds of plastic, lacquer or even “silk” that can be molded, layered or woven in many ways. Other bacteria are used to make pigments, perfumes and food supplements by the thriving biotech business. The exact procedures and especially the bacteria are well kept secrets; imperial law issues stern punishments for industrial spying.

The bioplastic is used in many technologies, from sails to military armour. Different strains of bacteria and raw materials produce different kinds of plastic, enabling artistic variety and local variants.

The kelp is grown in Margaritifer and Marineris in large kelp farms, tended by water gardeners. In recent years there has been problems with the rise of sea urchins grazing on the kelp, forcing the Empire to use criminals for urchin fishing.

### Computing

Xanthian mathematicians are among the world’s finest. Beside applied mathematics useful in industry and planning pure mathematics is favoured as an art on its own. The need for managing computers has led to the development of a wholly Xanthian branch of mathematics, algorithmicture, the science of designing and organizing efficient computations. Algorithmicture is both applied and theoretical, with researchers exploring what kinds of problems (both purely mathematical and information-theoretical) can be solved with what kind of organisation. Another purely Xanthian branch of mathematics is Quintak calculus. It explores the properties of fields, bulks, jumbles, wheels and melds of quintaks and their generalisations. Quintaks are 5-tuples obeying certain symmetry relations, linked to both issues of quasiperiodic patterns, quantum fields and Dakme-functions.

Xanthian bureaucracy has achieved many technological triumphs: everything from plastic folders to databases. Although they lack digital computers much can be solved using elaborate systems of plastic-backed index cards. The cards have rows of holes corresponding to search queries: if the card fulfils a given search the hole is open to the edge, while other holes are closed. To get all cards fitting a search one or more pins are passed through the collection and lifted; cards fitting the search criteria drop out (and can then be subjected to more searches). This way cards can be sorted and searched efficiently, and in turn be used to index vast document collections.