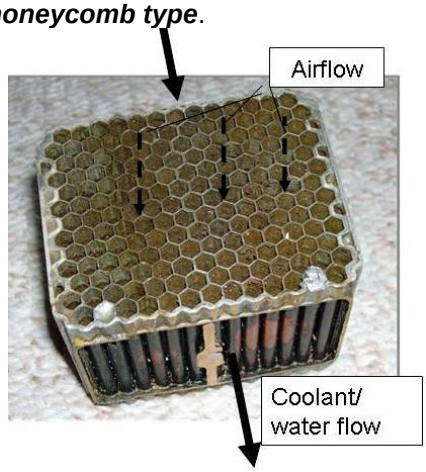
Radiator types - differences Honeycomb compared to Tube-and-Fin

I offer the following summary of some of the different characteristics between 1930's radiators and more modern (copper/brass and aluminium) types.
Others more knowledgeable please correct and amend.

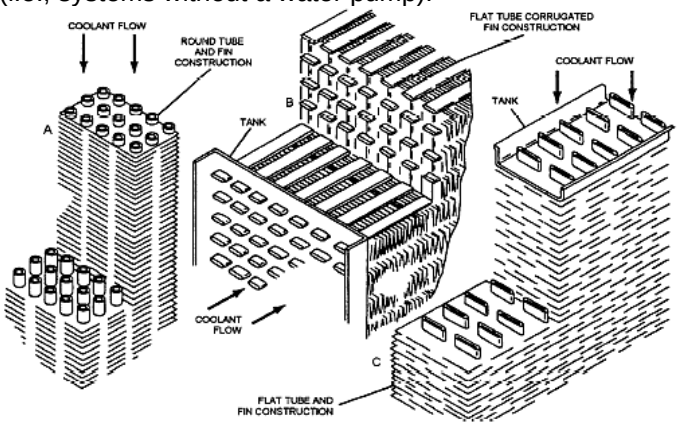
1930's car radiator cores where predominantly a ***honeycomb type***.

e.g., 



This type of construction features, amongst others, a large coolant flow cross-section between the 'outsides' of honeycomb airway 'tubes' – the honeycomb members being formed by stacking and soldering corrugated strips of (usually) copper together.
The large coolant flow cross-section gave a low coolant pressure drop, also a relatively low coolant velocity against the 'tubes'.
Heat transfer on the 'wet' sides of the core is more readily achieved (a dense liquid) than on the air side (a much less dense gaseous medium).

In contrast more modern ***Tube and Fin types*** of radiator core tend to have less cross-section area open to coolant flow – have a higher ***water-side*** pressure drop/flow resistance to thermo-siphoning cooling systems (i.e., systems without a water pump).



Also, higher coolant flow velocities, aided by a water pump, which promotes more turbulent flow against the tube walls which in turn enhances heat transfer into the metal 'tubes'.

Heat transfer on the gaseous/***air side*** is improved by creating a greater surface are by adding fins soldered/welded to the 'tubes'.

The fins can be 'plate' configuration or corrugated and further heat transfer enhancement from these fins may be achieved by louvring them which generates more air turbulence and enhances air-side heat transfer/ heat rejection.

The efficiency of tube and fin types means they are smaller than the old honeycomb types for a given heat rejection performance – lighter, less packaging space – smaller front ends, better aerodynamic drag, etc.

Copper and brass materials predominated in initial tube and fin radiators, but the past 20-30 years replaced by aluminium for cost, weight, and manufacturing reasons. Also (flux-less) brazing for aluminium joints has a higher melting point than solder used for copper/brass which enables higher coolant system pressurisation and higher boiling temperatures to be achieved.

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Remember that a fundamental of any heat transfer is to maximise the temperature difference between the hot and cold side of the heat exchanger (radiator).

With the foregoing in mind, I would think it advisable to fit a water pump with a modern type of fin and tube radiator, whether it be aluminium or other.

Regarding corrosion, it can't be recommended otherwise than to have a ***good quality and concentration*** (e.g., 50/50 ethylene glycol-based antifreeze and water).
'Antifreeze' should be considered a secondary property to the corrosion inhibitors it contains – ***corrosion prevails 100% of the time.***