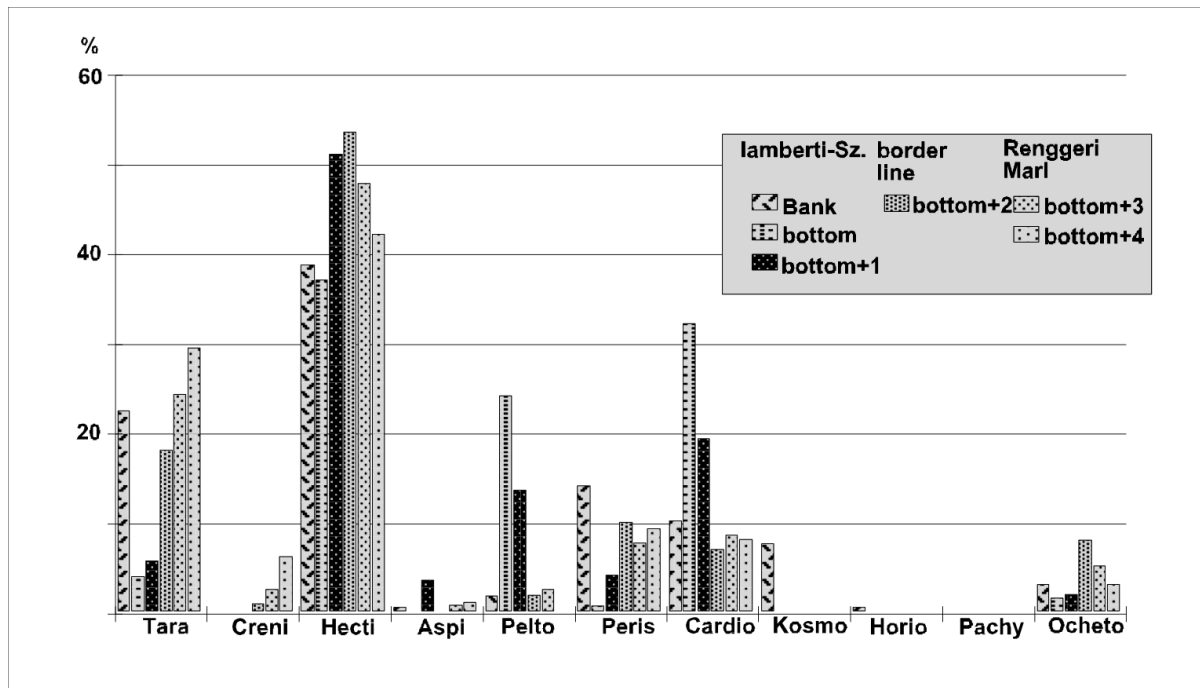




Changing of fauna profiles at the lower borderline of the Renggeri marl

The sudden appearance of *Creniceras renggeri* and the disappearing of *Kosmoceras* and *Horioceras*/*Distichoceras* is very striking. Interesting as well is the changing of frequency within the *Peltoceras*. This does not seem to be in line with Liesberg/left. Interesting in this respect is the statement of B. Hostettler that *Hecticoceras* at Chatillon/CH are the exceptional findings. *Pachyceras* only had been found at Normandy. This may mean that the layers with *Pachyceras* do not exist by itself or as a biotope in the search area or the according layers are older.

Species time range and chronological structure

sous-zones horizons peuplements affleurements	Mariae												Cordatum		
	Scarburgense					Praecordatum							Bukowski	Costicardia	Cordatum
	scarburgense		woodhousei			praemarin		albiacondatum		praecordatum			13	14	15
	1	2	3	4	5	6	7	8	9	10	11	12			
Présentevillers (25)															
Quenoche (70)															
Mandeure (25)															
Mambouhans (25)															
Vyt-les-Belvoir (25)															
Vauduse (25)															

Example: Structuring by R. Jardat (2010)

The attempt of such a detailed structuring might be desirable or even necessary, but besides all other problems in connection with it like determining of a species name (quotation of Prof. L. Hottinger, university of Basel/CH: Name giving is not correct but the geochronology) the above shown examples (which I agree because of not having a better idea) one problem one should not ignore: the time range of these different levels.

Example: Lets assume that the Mariae zone, just as an example, should have lasted 1 mio. years. If one can split this zone into the sub-zones - scarburgense and praecordatum, then the time range of these two sub-zones as an average lasted 0.5 mio. years. Question: Is it imaginable that two ammonite species (like in this case Mariae and scarburgense) have such a different time span of life (Mariae = 1 mio. years, scarburgense = 0.5 mio. years) ?

At the above shown example the mariae zone is split into five horizons, as there are scarburgense up to praecordatum horizon. When structuring like that, there do appear two different problems:

If the scarburgense sub-zone is followed directly by the praecordatum sub-zone, how come, that on level horizons three other horizons (woodhamense to alphacordatum) are between these two species? This for me only is logical possible if scarburgense as well as praecordatum are not used for defining sub-zones and horizons at the same time. And additionally: When calculating mariae zone ~ 1 mio. years then the scarburgense sub-zone (as only one of two sub-zones) is approx. 0.5 mio. years. And suddenly as the scarburgense sub-zone should contain two horizons (scarburgense and woodhamense) the scarburgense horizon becomes only 0.25 mio. years. So out of that: how long really lived the scarburgense species? Was it 0.5 or 0.25 mio. years?

And this is not a problem of name giving to a species but names within the above table.

Or: where was scarburgense, while woodhamense exists? Or: If scarburgense species is the same as sub-zone and horizon, how long does this type really exist?

These calculation examples don't get better when looking at level "peublement". Probably one ends up with the problem "variation width" and valid criterions for "name giving".

This problem was not created by R.Jardat and is also valid for the cordatum-zone which has 3 sub-zones according to the standard zonation of Dean, Donovan and Howard.

An additional time problem arises when one is talking about finding fossils, whether they were digged "in situ" (layer by layer) or picked up from the surface. Digging "layer by layer" is supposed more time accurate than just picking up. This sounds logical, but in reality is not. Let's again take the Renggeri Marl at Liesberg/CH as an example. The Renggeri Marl there is a sediment of about 50 m for one Ammonite Zone (mariae zone), that means 50 m or 5000 cm for 1 Mio years or 200 years for 1 cm ($1'000'000$ divided by $5'000$). But sediment and hardened Renggeri Marl is an additional time factor. And as the Marl there is not horizontal (but nearly vertical) without any markers for the ancient horizontal sedimentation, the exact time definition additionally is incorrect. As an example: If 1 cm of Marl today is about 10 cm of sediment, it would mean $2'000$ yaers. And what ever the life span of an ammonite was (lets say 5 years) that would mean 400 generations for an ammonite. This already in my opinion is a time span where something may happen to the ammonite animal or shell respectively. It does not make sense to go into further detail about life span of ammonites, as at some areas the thickness of the Renggeri Marl ist only 5 m.