Table 1.2

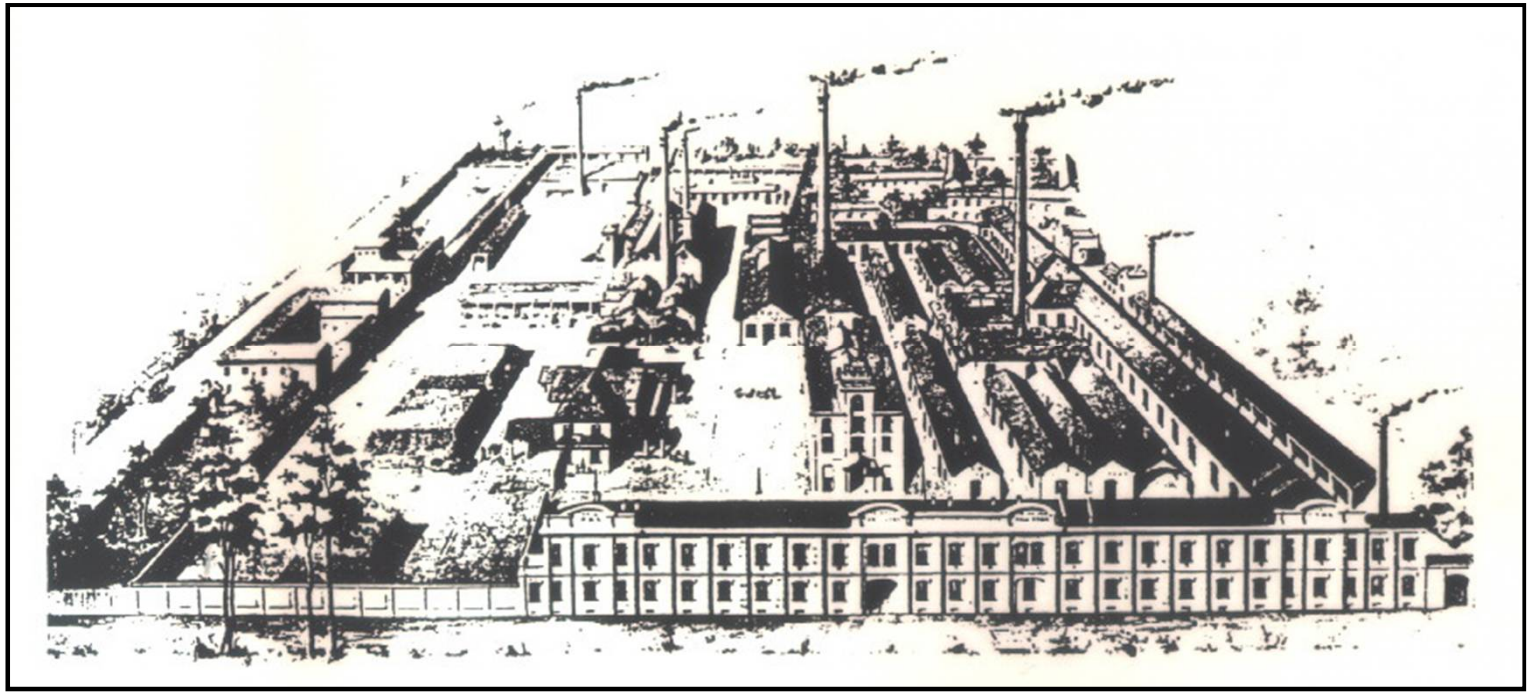
PIONEERING CONTRIBUTIONS OF CEST/FISPA TO GAS CHROMATOGRAPHY

1956	Fractovap the first GC manufactured in Europe
1971	Splitless (SL) injector for trace analysis by capillary GC
1975	First worldwide dedicated capillary GC
1978	Cold on column (OC) injector for quantitative capillary GC
1979	First capillary dedicated GC with automatically actuated SSL and OC injectors and dedicated electronic and pneumatic systems
	Parallel and serial multiple detector system for capillary GC
	Automatic large volume head space sampling with on-column cryotrapping for capillary GC
1981	Multinjector for 10 capillary sampling modes including programmed temperature vaporizing (PTV) injector
1982	Autosampler for thermal desorption and dynamic head space for capillary GC
1983	Ultrastable GC oven for fused silica columns
1984	Autosampler for SSL and OC injectors
1985	First high temperature capillary GC columns and GC instrument
1986	First GC system for automatic large volume liquid injections into capillary columns
1987	First O-FID oxigenates analyser
	Complete Micro HPLC system for microbore and packed capillaries
	Automatic and computerised SFC instrument for capillary and micropacked columns provided with tandem pumps
1988	Automatic instrument for on-line SFE-GC/SFC
1989	Dualchrom: the first on-line HPLC-capillary GC coupled system (automatic and computerised instrument)
1991	Variable geometry SSL vaporizing injector for elliminating discrimination
1993	Universal autosampler for conventional and large volume injection
1994	Ultratrace GC: automatic and computerized instrument for large volume sample injection into capillary columns

- 1948年:　イタリア、ミラノのCarloErba社がGCの開発と製造開始
- 1956年:　欧州初のGCをFractovapシリーズをCarloErba社が発売
- 1975年:　ワールドワイドでのキャピラリGCをCarloErba社が発表
- 1978年:　Cold On-column注入口の定量用GCを発表
- 1996年:　欧州最大のGCメーカであるCE Instruments（旧CarloErba社）がThermoグループに統合

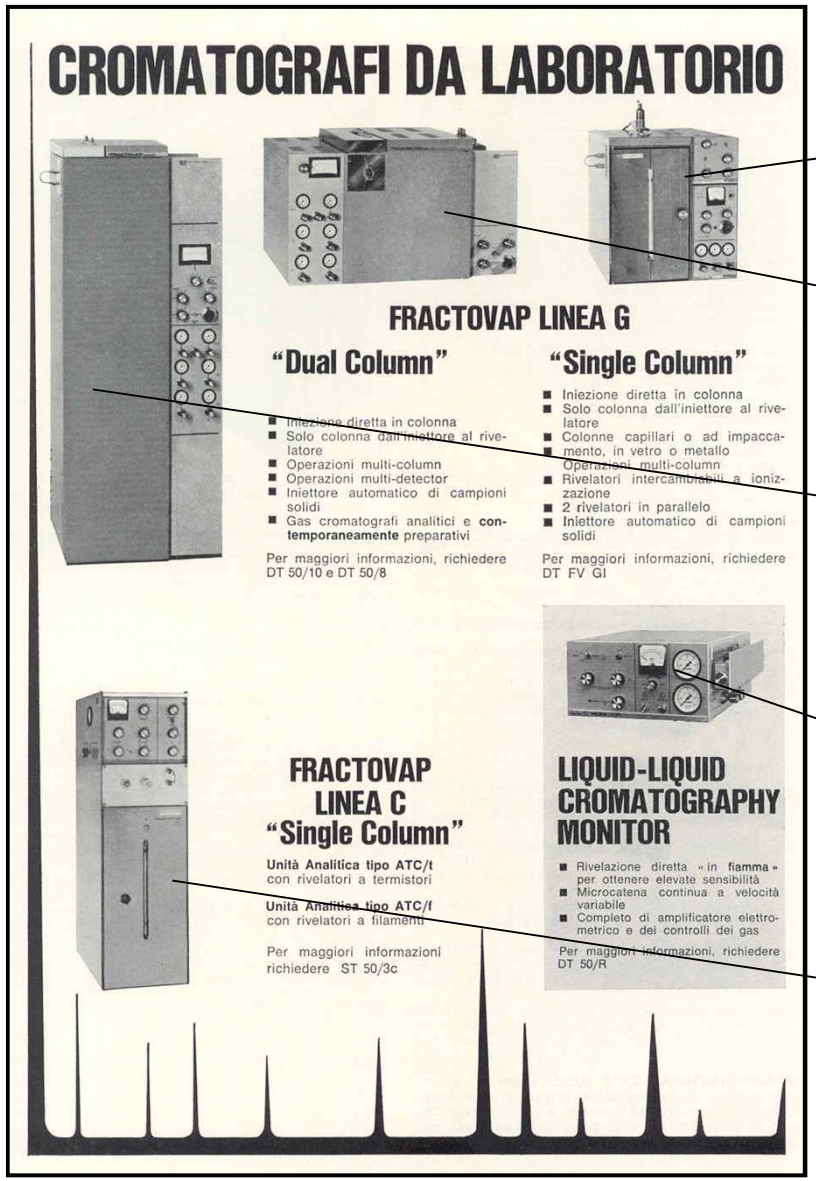
かれはカルロ・エルバです。

１８００年代に欧州で活躍した化学者です。



1857年にできたミラノのカルロエルバ社の最初の製造プラントです。

FRACTVAPシリーズは1956年に発表された欧州初のGCです。



Fractovap G
Single packed column GC
with FID

Fractovap G
Dual packed column
GC with FID

Fractovap G
Vertical column mounting
Analytical and preparative GC

Liquid –Liquid
chromatography monitor
Flame based detector

Fractovap ATC
Only with thermoconductivity
detectors

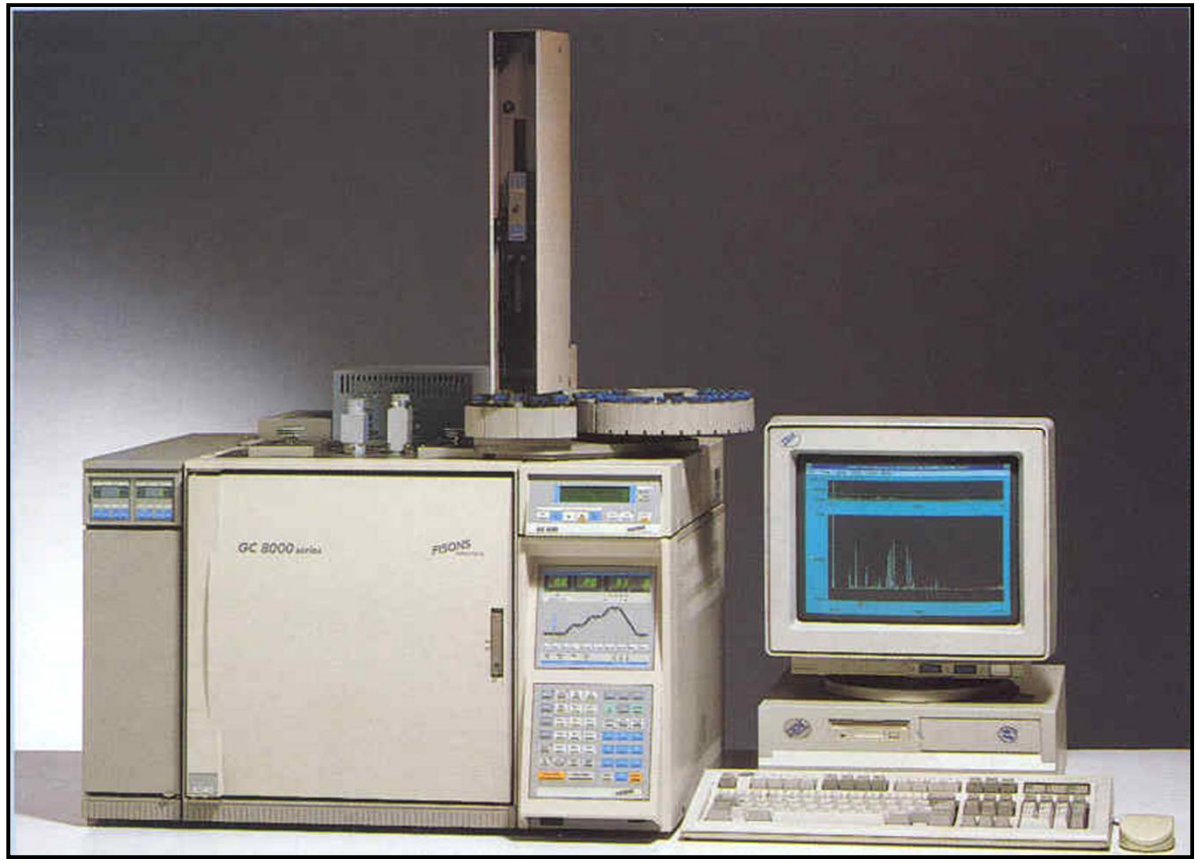
Fractovap D

- Dual column

- Dual FID

-- Dual TCD

--Temperature programmer



ULTRATRACE GC:

最初の

・コンピュータ制御

・大容量注入口

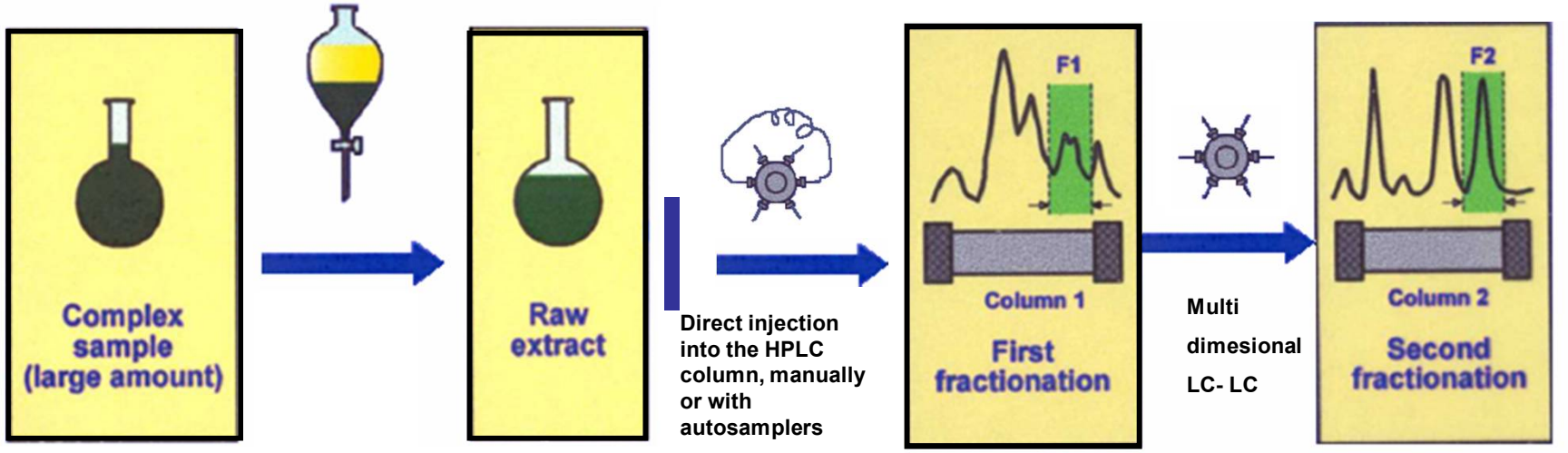
　キャピラリカラム

のGCです。

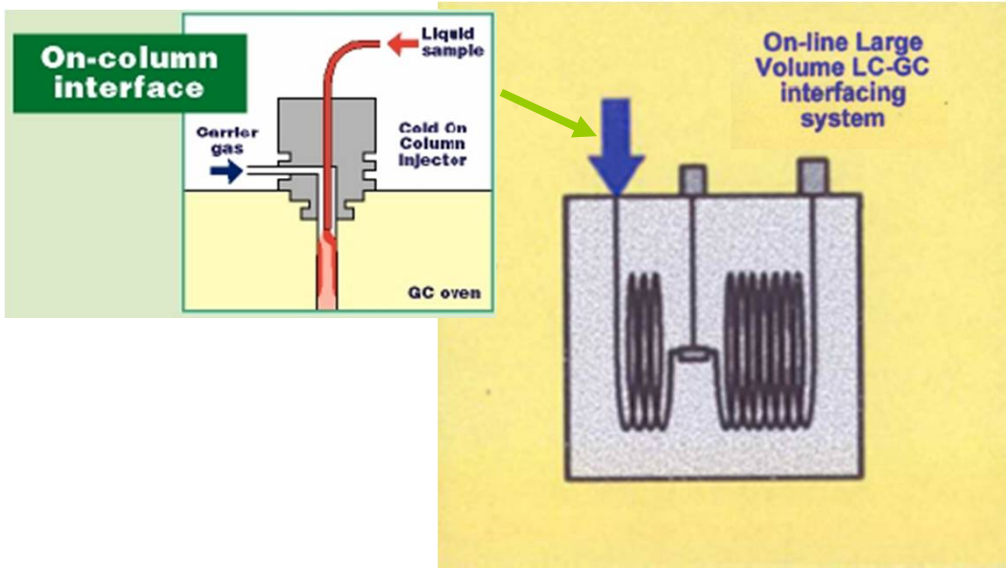
LC—GCの歴史

- 1980年代に考案されました。
- 大容量GCの技術からヒントをえました。
- 1989年にCarlo Erba/Fisons/Thermo 社が Dualchrom 3000を製造開始

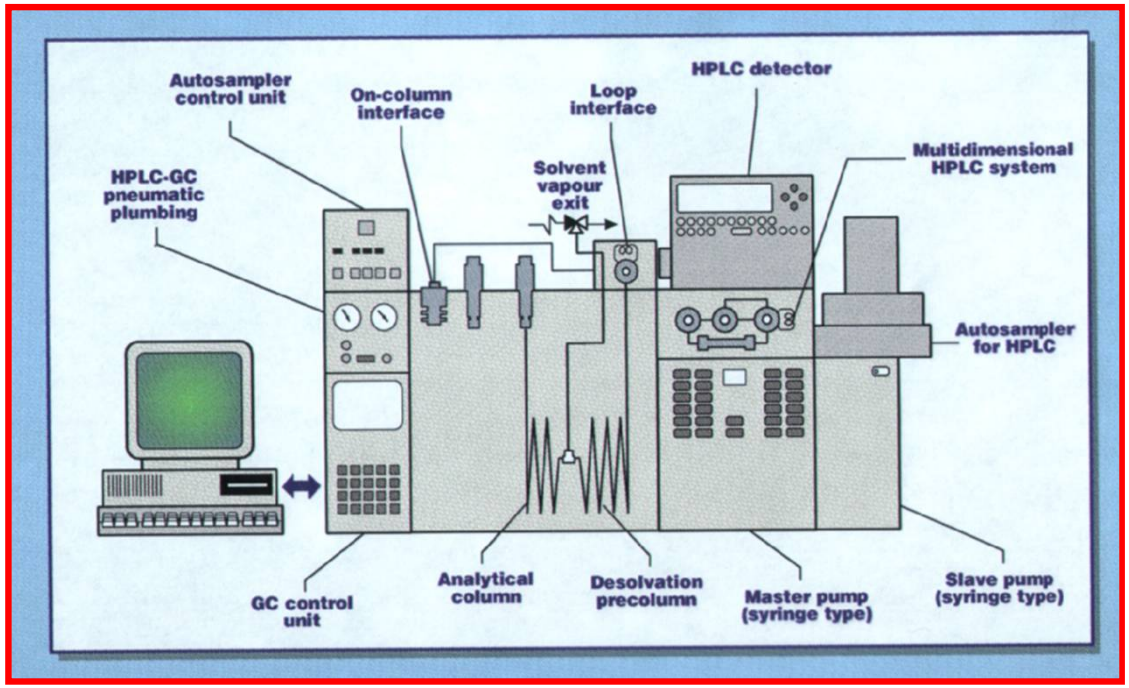
LC-GCによる前処理について



On-line fraction transfer to the GC capillary column



初の LC-GC



Dualchrom 3000