Still Crazy about Brewing after all these Years

By

Finn B. Knudsen


TUBORG BEER

Content

- How a brewing career started
- Learning existing Brewing Technology
- Examples of projects, new and applicable technologies
- International orientation and experiences
- Comments on new technological opportunities

Starting a Career in Brewing

Tuborg Breweries

In

Hellerup, Denmark

Learning about Brewing Technology


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TUBORG-LABORATORIET

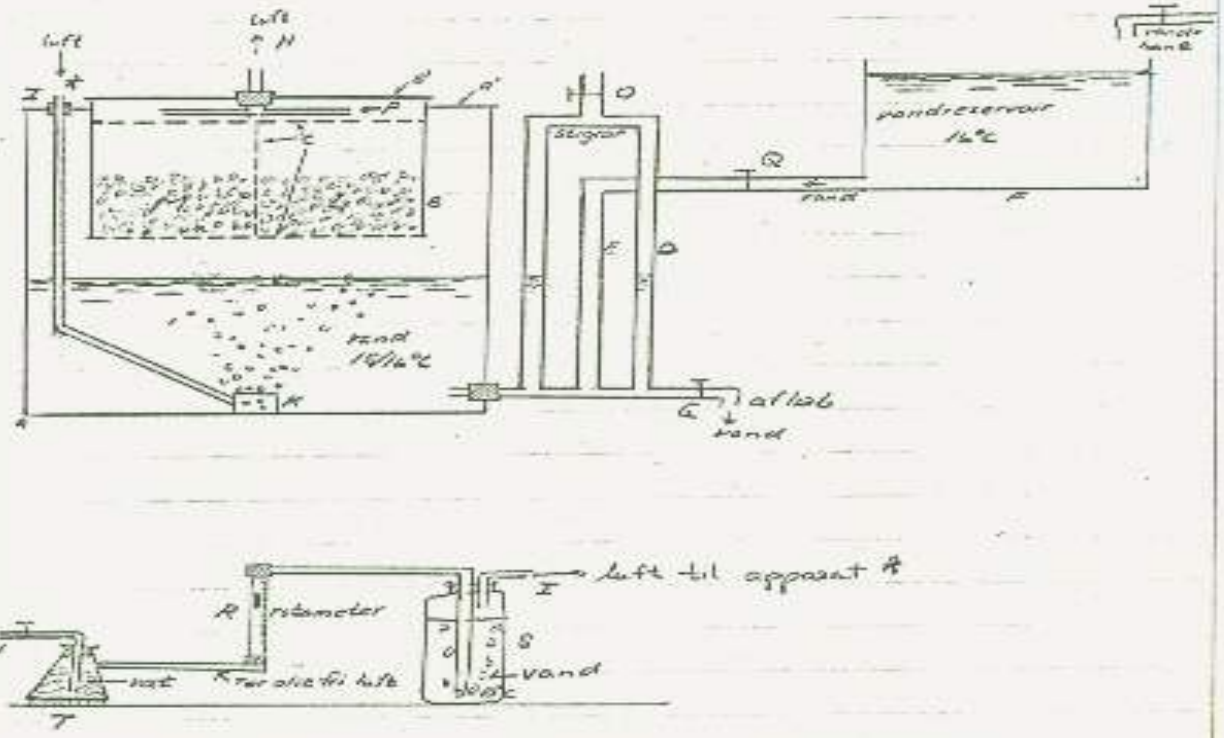
minimalkning

skitse af apparatopstilling

F&K

Side

Dato 29-4-66



A: Ydre kar
B: Indre kar
C: Trådnet
D: stigrør-overløbsrør
E: Tilløbsrør
F: vandreservoir
G: Fraløb
H: afgang for luft
I: Tilgang for luft
K: Luftfordeler
L og M: byggegrever.
O: hane ved stigrør
Q: hane for vandtilgang
R: Rotameter
S: vandbeholder
T: skylle

A': Låg m. huller (Diameter 38cm ; Højde 37cm)
B': Låg m. huller (Diameter 38cm ; Højde 14cm)

P: luftafgangsfordeler.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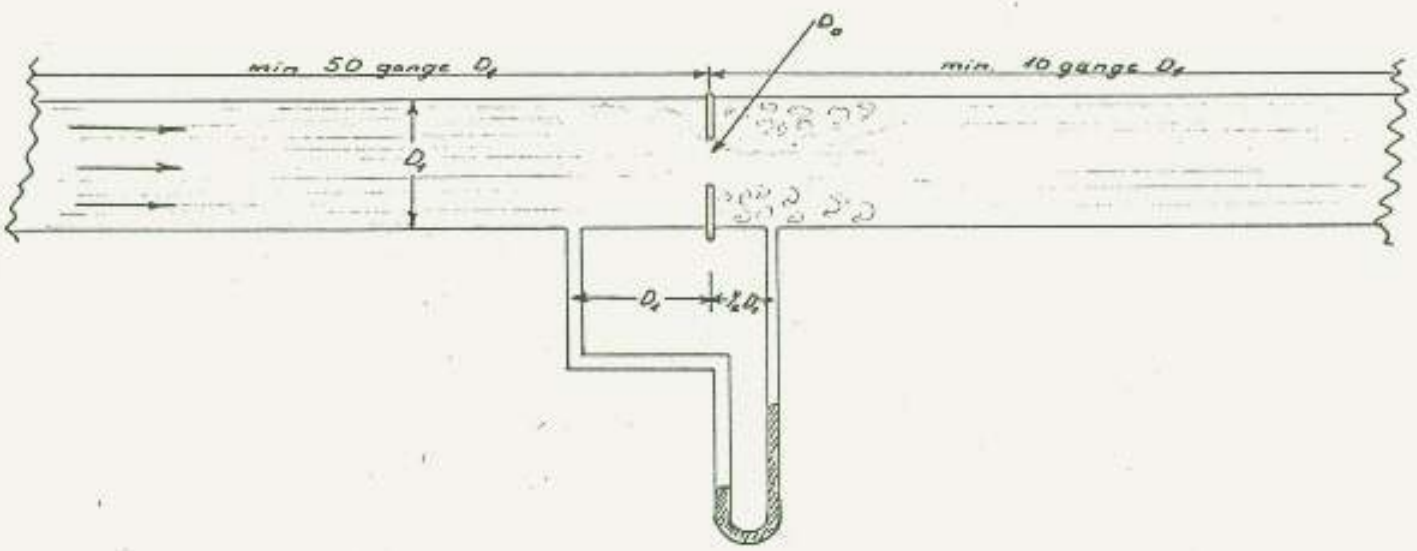
Examples of projects, new and applicable technologies



måle blande tykkelse:

1/30 gange D_1, eller 1/4 af D_o

eller 1/4 af $\frac{D_1 - D_o}{2}$ som

maximal tykkelse af blanden.

A. AFPRØVNING I FORSØGSLABORATORIET

Forsøgsopstilling:

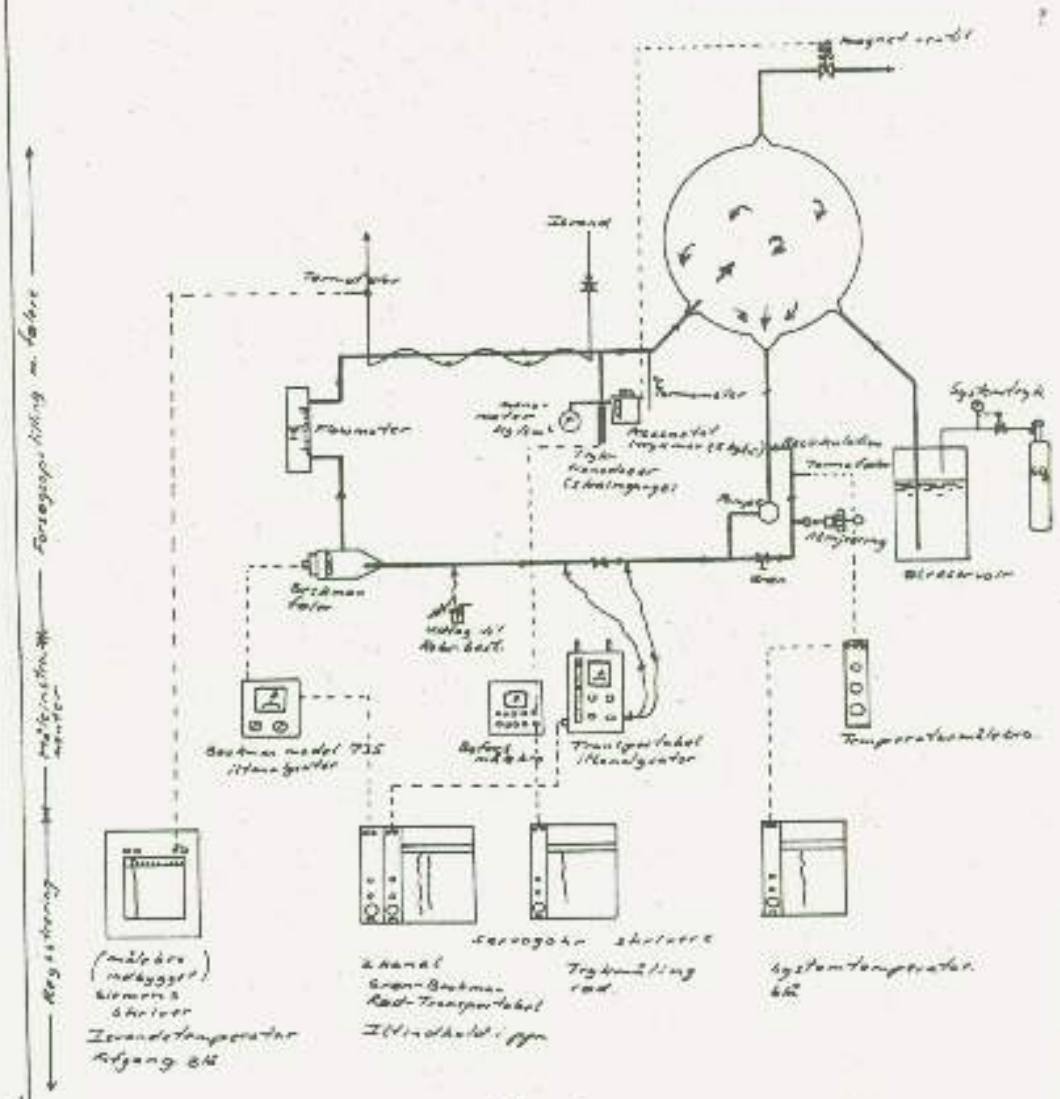
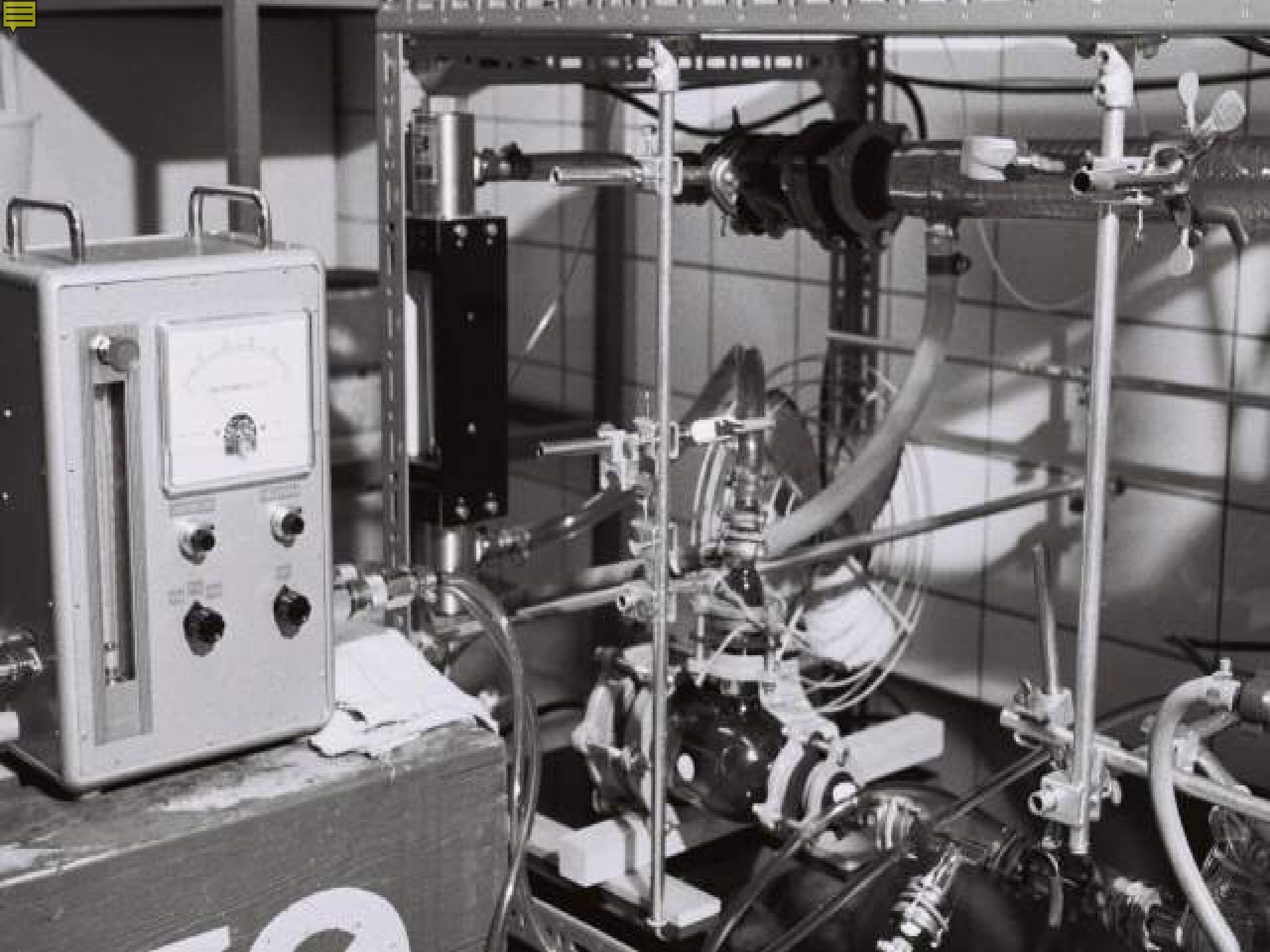
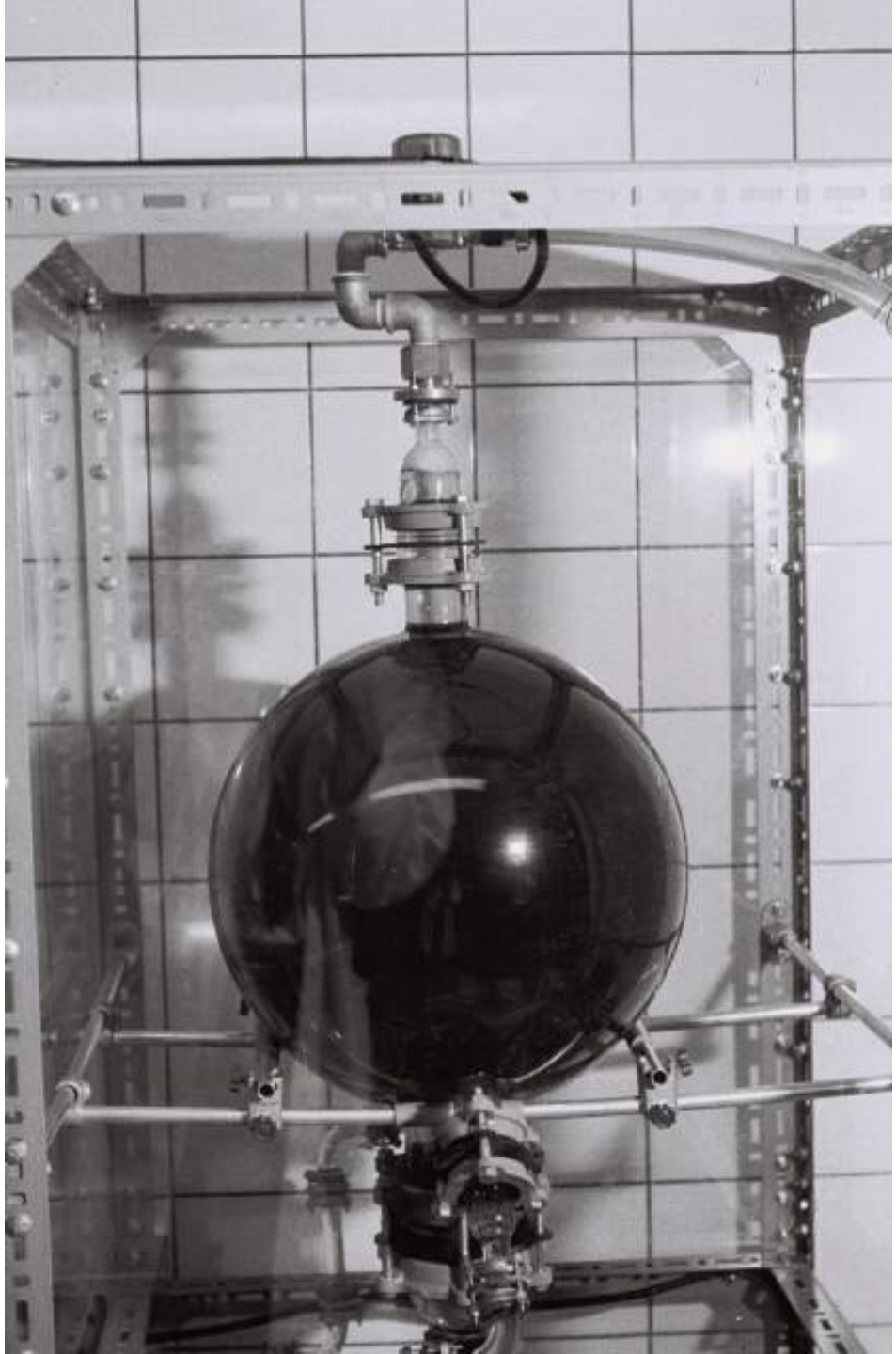


Fig. 1



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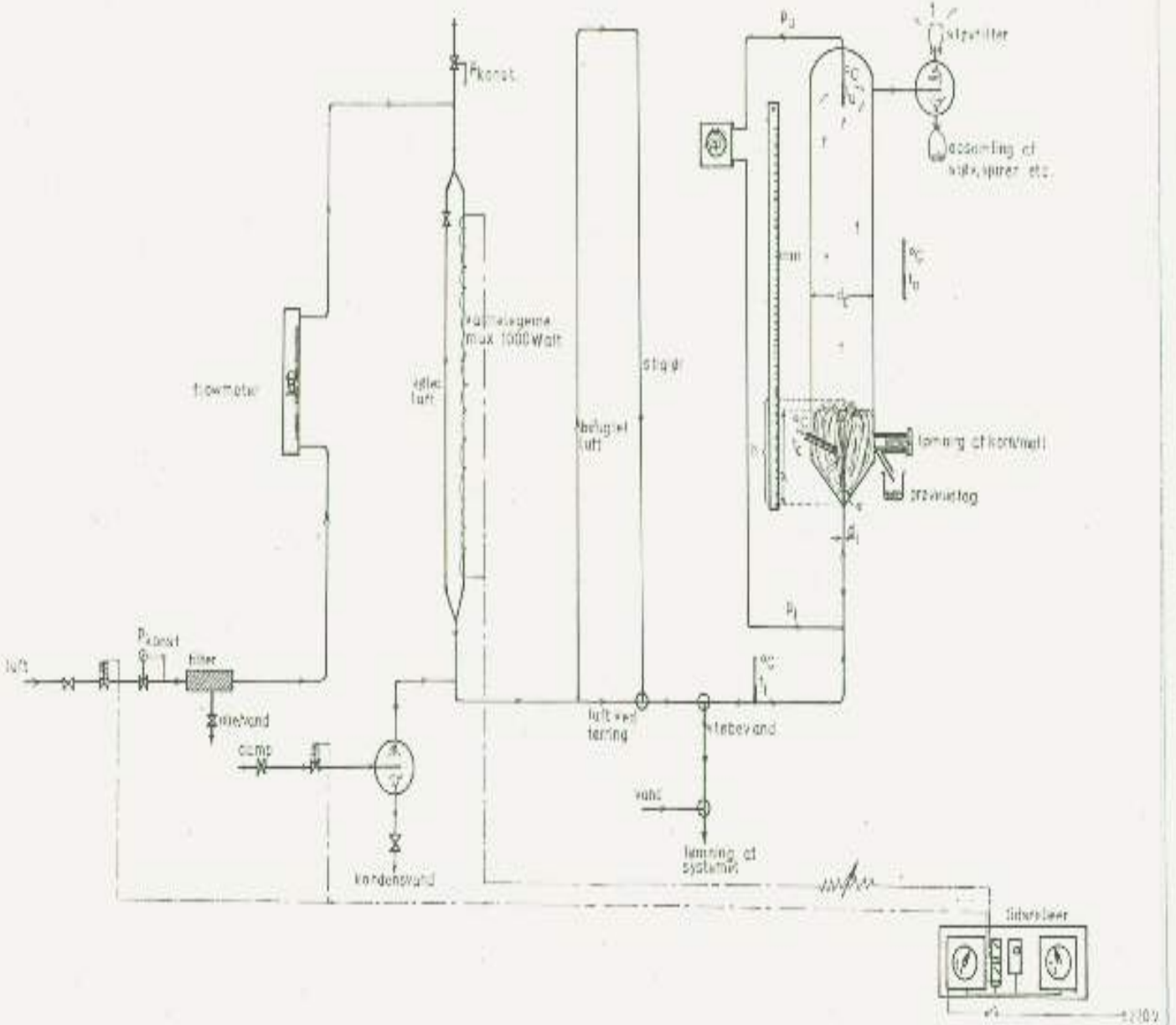
FORSØGS-
LABORATORIET

Nr. 53
Dato 11/4-69




F BJØRN KNUDSEN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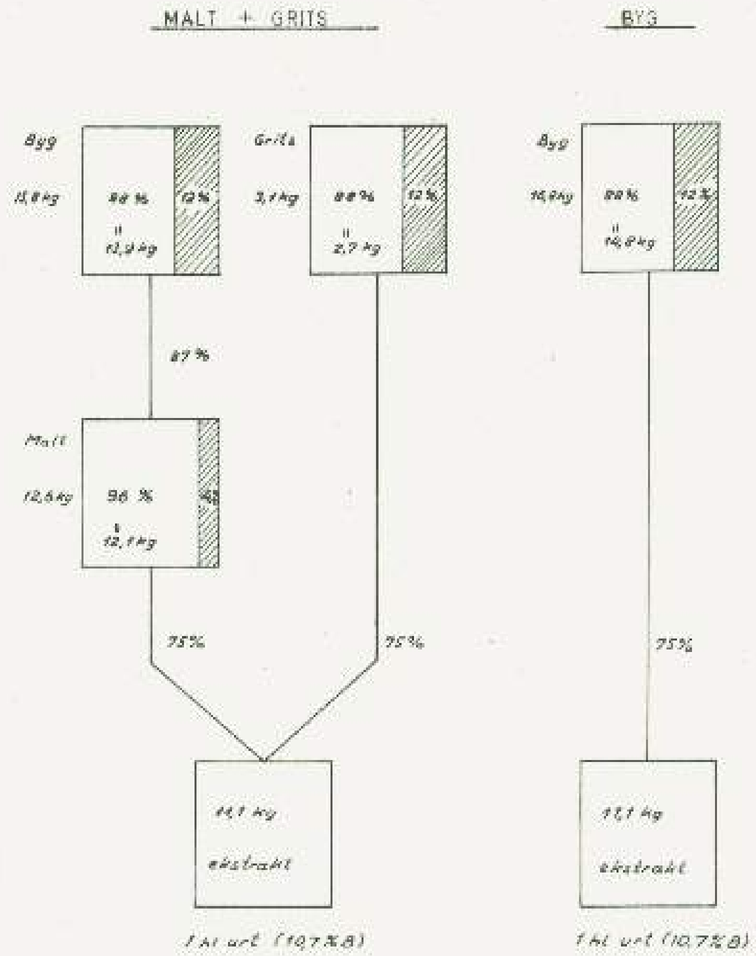
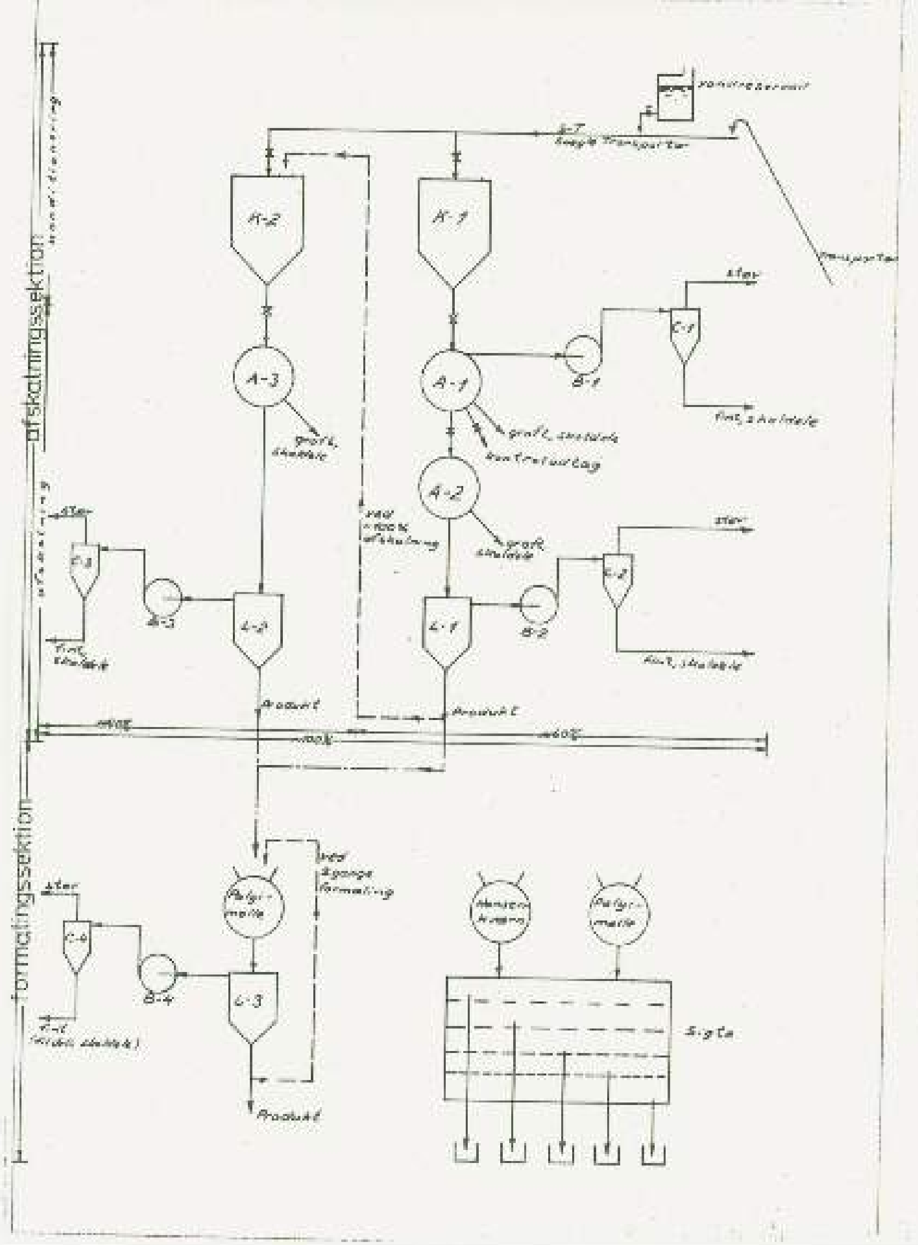
Råstofforbrug ved fremstilling af 1hl urt ud fra



▨ vandindhold



afskalningssektion
formalingssektion
K-2
K-1
A-3
A-1
A-2
B-1
C-1
støv
fint. skaldele
grove skaldele
B-3
C-3
L-2
L-1
B-2
C-2
Produkt
100%
60%
Palgi-mølle
B-4
C-4
L-3
ved 2gange formaling
Hansen-kværn
Sigte


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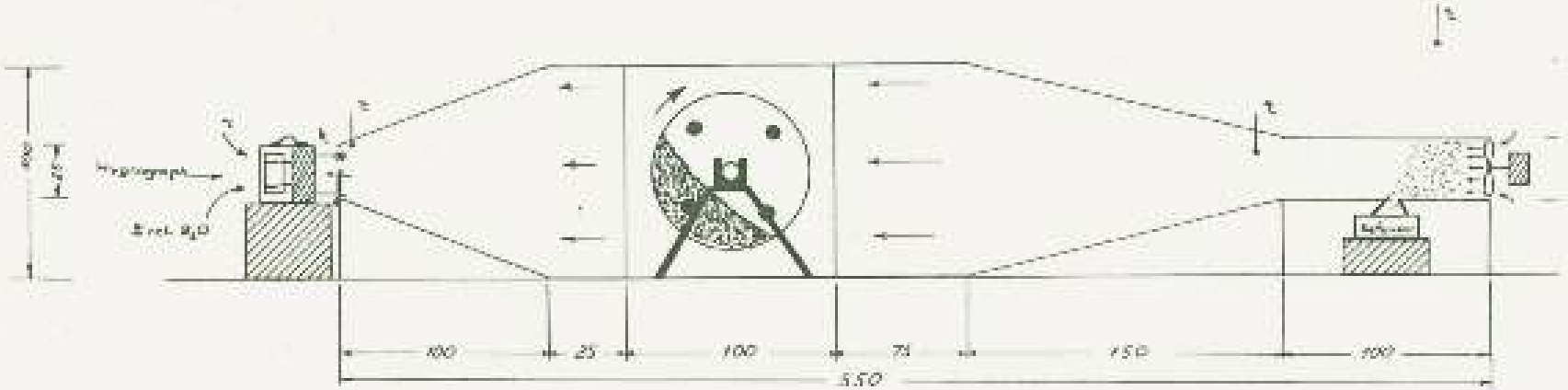
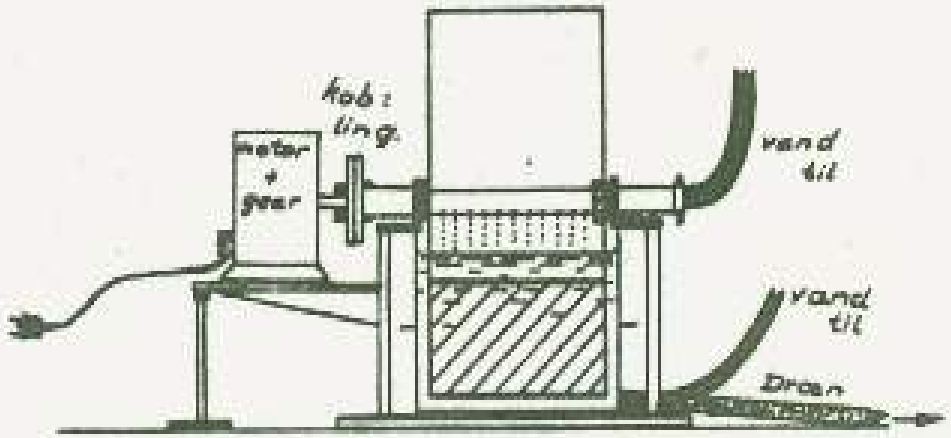
Fig. 7



Set fra siden

Set forfra



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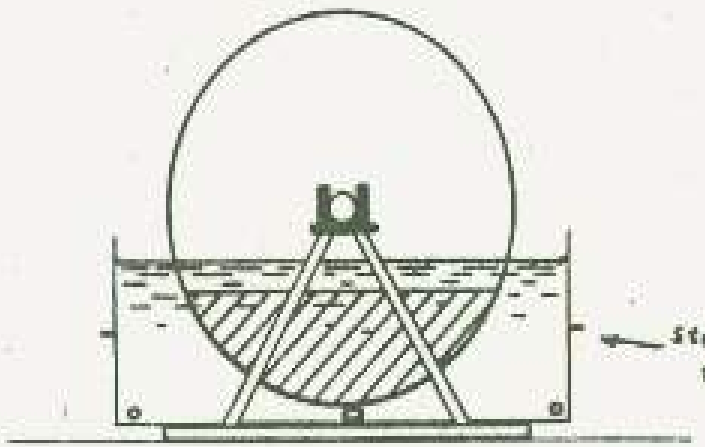
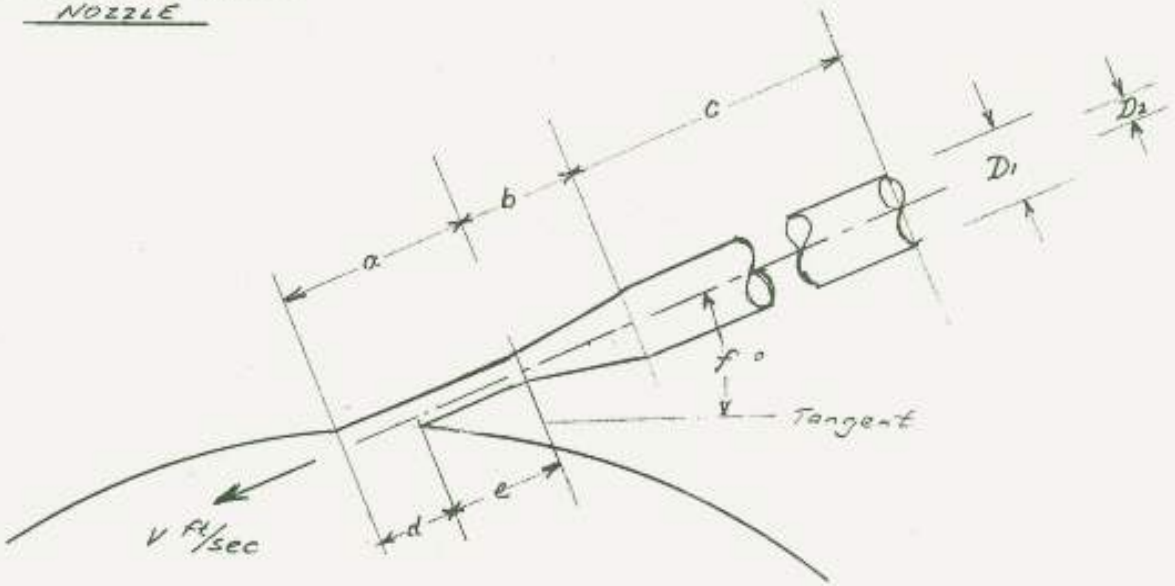


Vand til Dræn (trykmåler)
(ej benyttet)

Fig. 6

WHIRLPOOL DESIGN
NOZZLE



- TANK LIQUID H/D
- Relation ships a, b, c, d, e
- F° angle
- V ft/sec

FINN B. KNUDSEN
1993-07-14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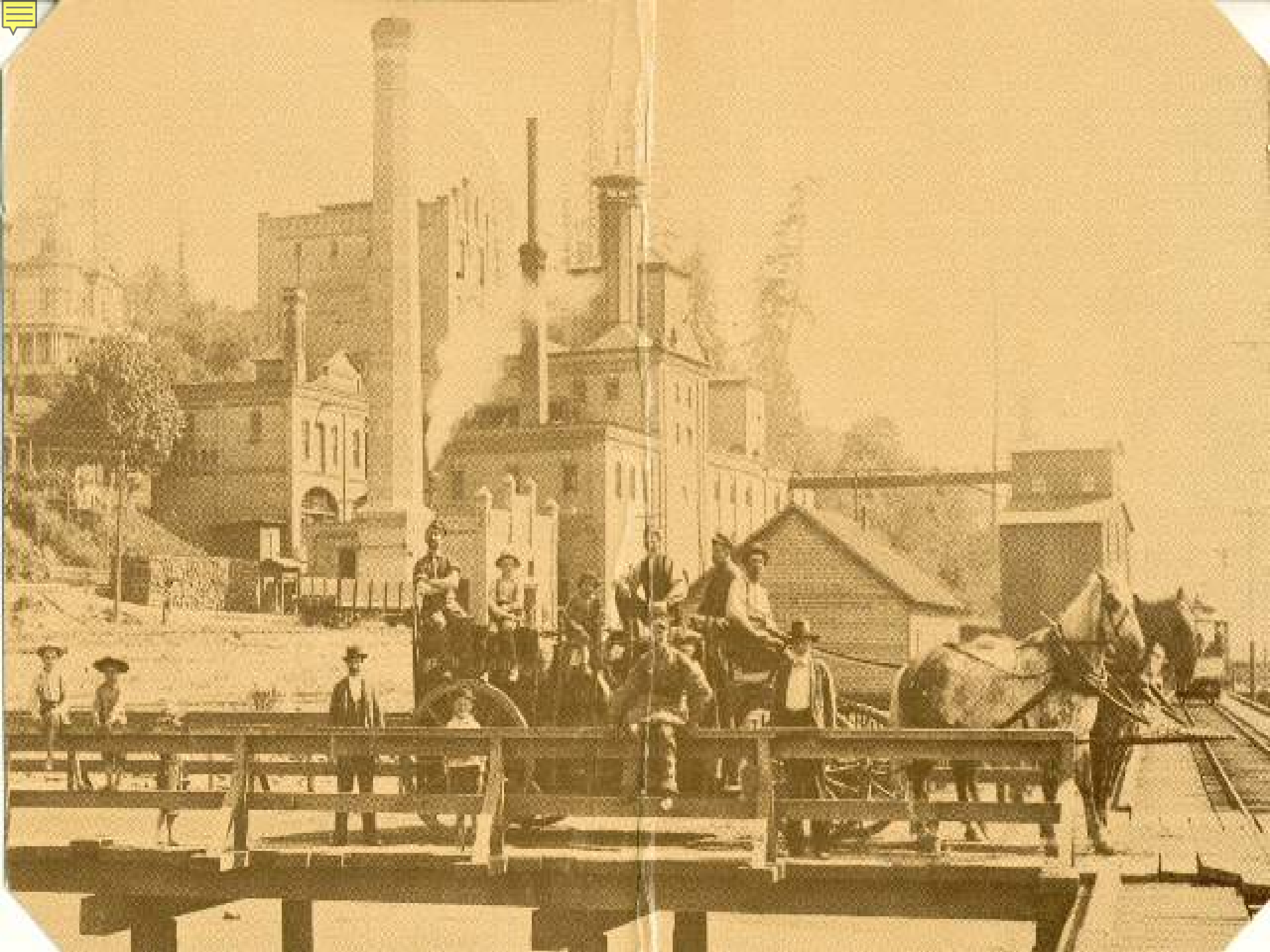
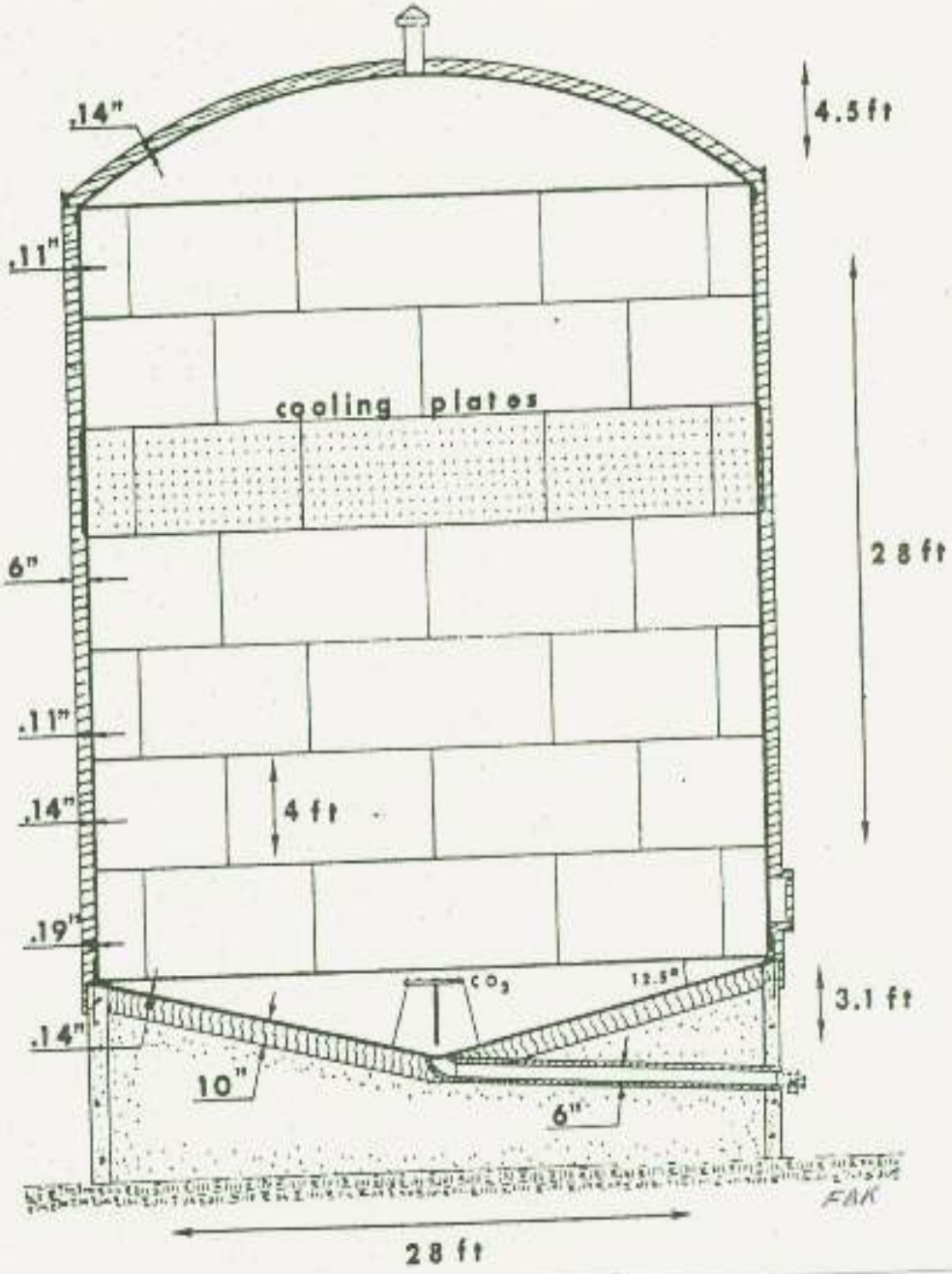
International orientation and Experiences




.14"
4.5 ft
.11"
cooling plates
28 ft
6"
.11"
.14"
4 ft
.19"
CO_2
12.5°
3.1 ft
.14"
10"
6"
FAK
28 ft

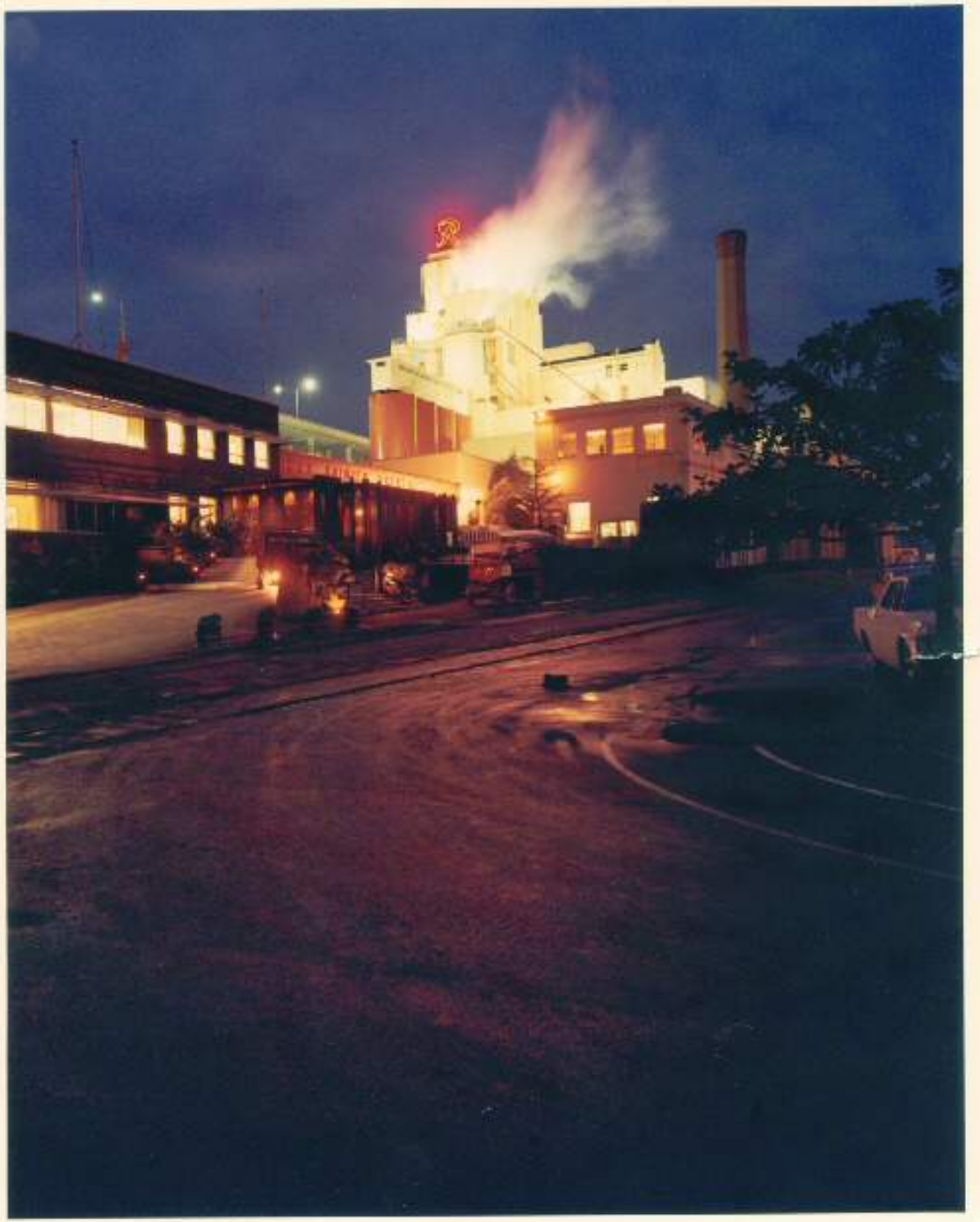


Fig. 1
Additive injection.

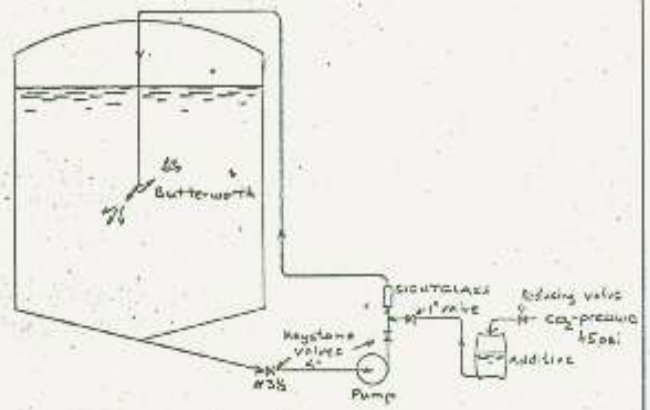
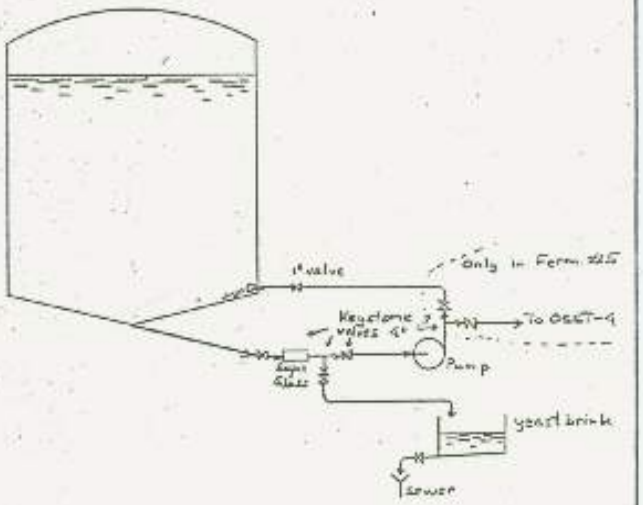
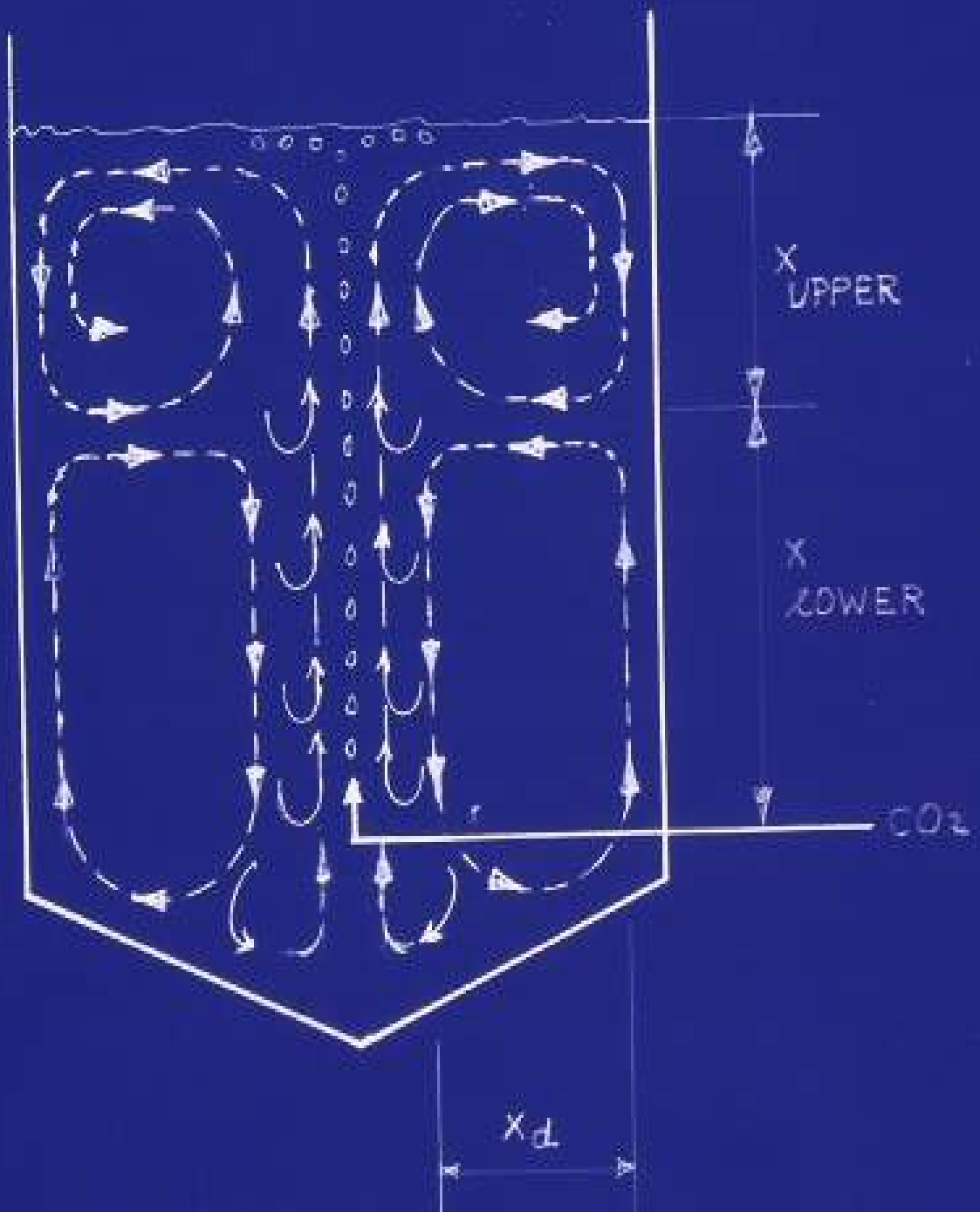


Fig. 2
Yeast collection.
Flushing.




X
UPPER
X
LOWER
CO2
Xd

a
b
c
d
e
f


MOLSONS

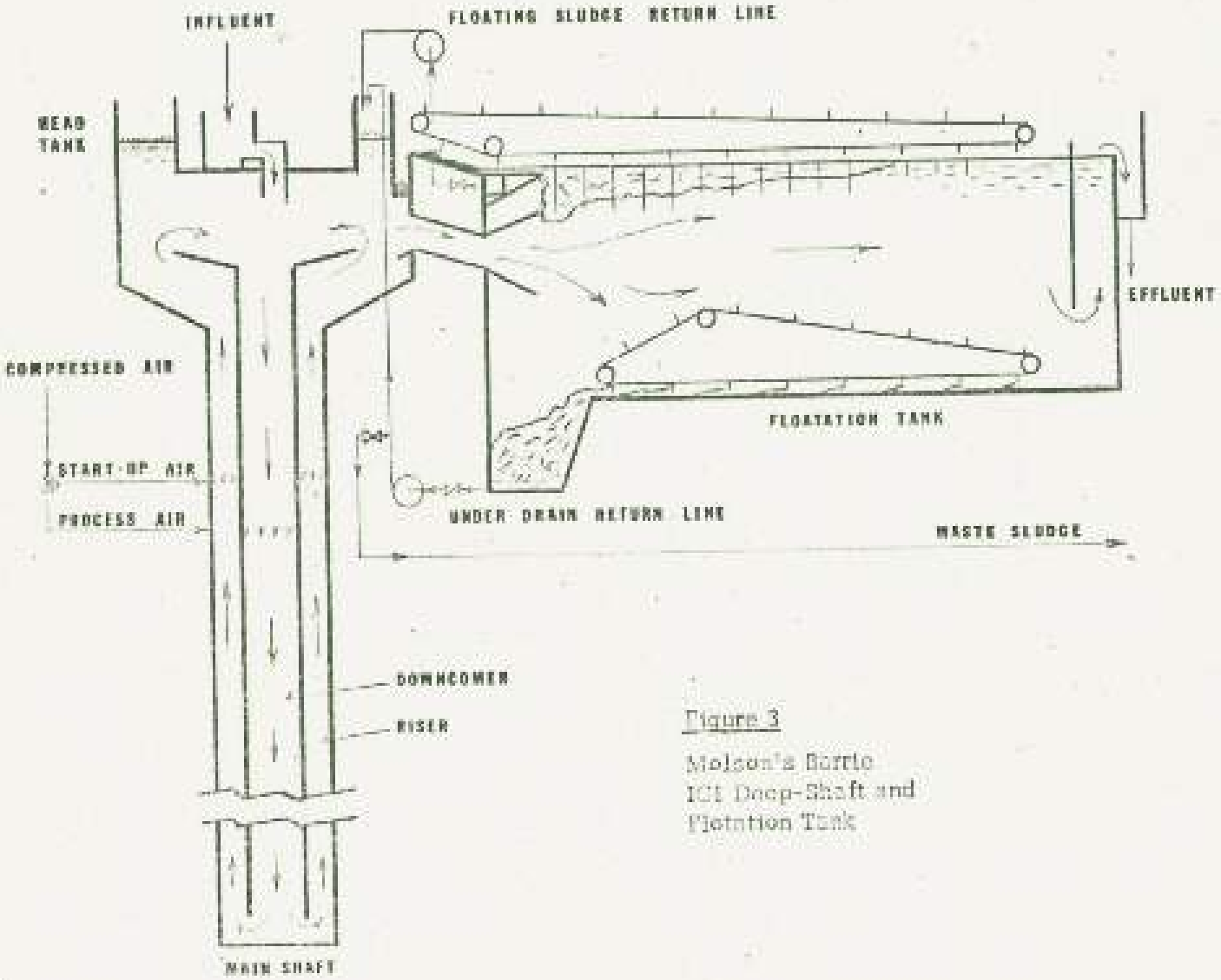
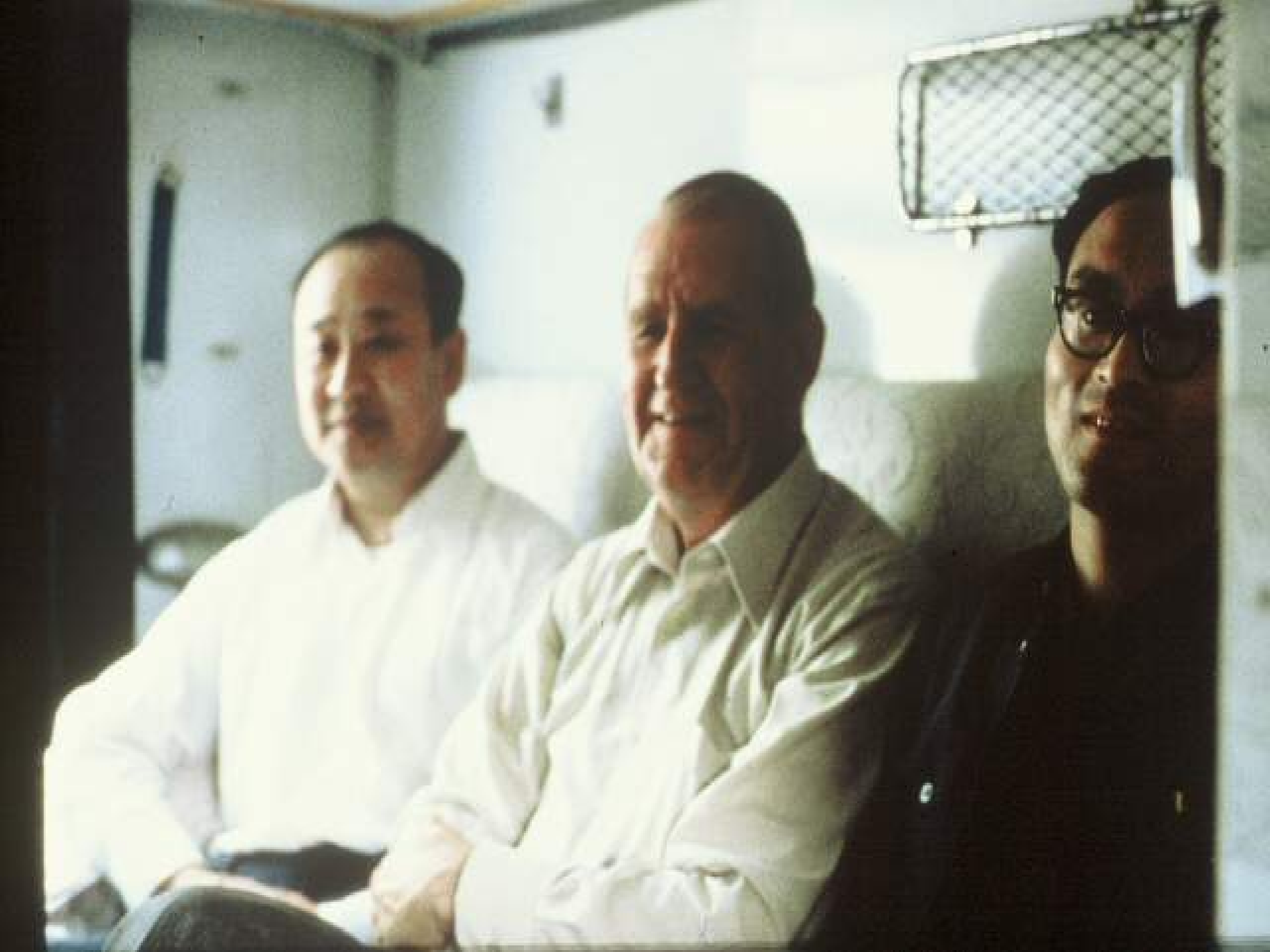


Figure 3

Molson's Barrie
ICI Deep-Shaft and
Flotation Tank


PILOT PLANT


大庆式企业



中华人民共和国
广州市食品工业公司
广州啤酒厂
和
丹布鲁咨询有限公司代表
嘉士伯啤酒厂有限公司
的

技术合作协议书

日期：1981年10月16日

啤酒技术合作协议书

中国广州食品工业公司和广州啤酒厂（以下称：广啤）与丹麦哥本哈根丹布鲁咨询有限公司代表嘉士伯啤酒厂有限公司（以下称：嘉士伯和丹布鲁）于一九八一年十月六日在中国广州市通过友好协商，签订本协议书。

第一条　技术合作项目

1—1. 嘉士伯和丹布鲁向广啤提供专门技术和下列领域内的合作：

A. 加工技术是以嘉士伯在哥本哈根及国外，特别是嘉士伯香港啤酒厂〈以下称：香港嘉啤〉的生产工艺为基础包括成套加工技术有关设备及图纸等资料。

B. 技术〈咨询〉合作，包括广啤现代化和扩展的有关加工方法和其设施技术图纸。

C. 技术合作的目的和范围是：嘉士伯和丹布鲁协助广啤以改进广啤啤酒质量，使它能达到嘉士伯啤酒同等的质量水平，以缩短啤酒发酵期为28天。

1—2. 嘉士伯和丹布鲁向广啤提供和允许广啤得到和使用香港嘉啤的生产工艺技术资料应包括：

A. 全部工艺操作及设备维修保养技术规程。

B. 各工序的操作方法：如原料、辅料糖化煮沸、糊化麦汁过滤，旋流式沉淀槽〈缸〉发酵、贮酒、啤酒过滤〈硅藻土过滤〉酵母培养〈包括纯培阶段〉酵母洗涤、回收贮存、二氧化碳饱充等详细工艺操作方法及技术资料。

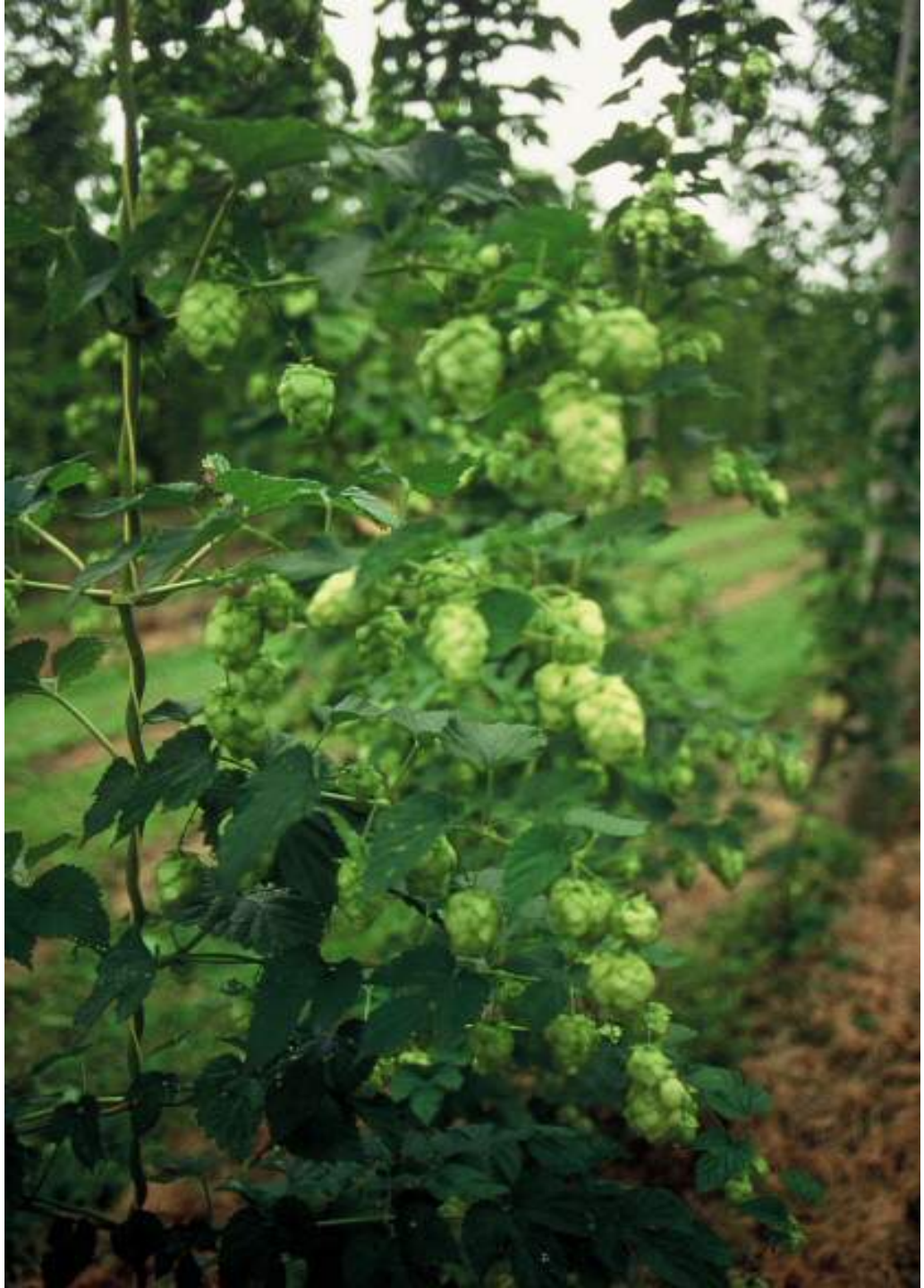
C. 包装部份和动力中心，冷冻系统等设备〈总图和布置图〉。

阅 陈 [illegible]/10


CGRX 5001


2 9 '93


New Zealand
Travel
NORTH ISLAND
SOUTH ISLAND



New Technological Opportunities

- Yeast Propagation and Handling
- New Milling Technology
- Other

Yeast Propagation and Handling

- New developments described in the literature of faster and more consistent yeast propagation
- New possibility emerging of using fresh propagated yeast at start of each Fermentation
- Fewer vessels will be used from yeast culture to full scale production fermentations
- Assurance of more consistent and reliable fermentations and less chance of contaminations
- More economical

New Milling Technology

- Traditional milling based upon grinding
- New technology is not based on grinding but an air separation technology
- Opportunities include benefits such as
  - Tight particle specification
  - Significant lower capital and operating cost
  - Substantial less energy requirement
  - Less space
  - Increased utilization of raw materials