2. Flowchart 2.1 sets out the development of Open Tank treatment from the initial Type A system.

a. Annotations (A) eg. (A1), (A2), (A3), demonstrate the separate pathways involved in evaluating the accumulating data, establishing effective chemical control methods and their subsequent extension to field and plant status. It will be noted there were progressive developments in the evolution of treatment groups and in which density was of increasing importance and, due to extensive research on a sensitive in-situ spot test (Ch. 11) which enabled study of preservative distribution in hardwood tissues, led to the clarification of macrostructure roles in de-aeration and liquid movements during treatment.

b. Flexibility of plant operations is summarised in pathways (B). For example (B1) relates schedules (Ch. 12) to species and classification into Groups.
   This extended (B2, B2-1) to other Open Tank systems (Appen. 14) and subsequently extended to vacuum pressure treatments. Importantly the control practices extended to the latter.

   The flexibility in plant design materials and ability to use fungicides to protect rainforest and softwood timbers is emphasised in (B4).

c. Data was accumulated over a range of provenances as well as plants for the multiple species being treated.

d. For thermal processes, plant thermodynamics (Ch. 13) were correlated with theoretical principles and similar research conducted on wood/air/water/preservative liquid relationships with initially macro-structure and then the micro-structure (Chs. 8, 12, 13, 14). These are shown in pathways (D) to (F) and enabled the writer to confirm the preservation practices followed fundamental principles, which were different in some aspects to those applying to softwoods. New theoretical concepts (Ch. 12) were formed and found applicable to these species.

3. Flowchart 2.2 demonstrates the similar research when vacuum pressure (full cell) plants were introduced and in which the author’s earlier studies on thermal systems and his previous experience (1958) during secondment at DFP., were applied. Pathways (G) to (J) show the progression in this field. This led to similar fundamental (and novel) principles being demonstrated for angiosperms in which the species structure was significant.

4. For both open tank systems and vacuum pressure plants, the consequential results was a viable industry which was effective in conservation of forest resources.
Explanatory Notes - Flowchart 2

Notes:

1a. Chart 1 (p.1) summarises the influence of the size of a sawmilling, or major processor, organisation upon both the economic capital cost of a treatment plant which may be installed and the auxiliary facilities such as steam generators, handling equipment and capacity available for such plant.

For such organisations, if a primary sawmiller, total log input processed per day is high but, dependent on product such as structural timbers, the range of species may be principally Group 2B, 3, 4, but if principal milling was in rainforest timbers as well as structural products, the range for treatment was high. Sub-stacks for segregation in seasoning (based on kiln or air practices) were often combined for treatment, until Group schedules (Ch. 12) were developed and shown to provide large economies in treatment. In that era, Price Control (then 11 shilling / 100 s.ft [imperial units quoted]) placed an emphasis on costs. If treatment was by a processor, who may not only saw logs but drew supplies from a wide range of sources and species, the operational economics meant a spread of possible species, moisture contents and wood densities in any charge could increase. This also applied to seasoning practices such as air drying followed by kiln seasoning.

Consequently, from a production perspective, this led to use of a “Standard Schedule” with relatively large “safety factors” and a high Coefficient of Variation for the results in the treated timber. To meet that need, the firm based such schedules upon a “representative species” which represented a major percentage of total log or sawn product.

This explains the extensive research on sampling methods as well as correlation of water and salt usage in terms of total charge volume and identification of treatable volumes, based not only on starch positive zones, but on “sapwood zones. Effects of “Reactivity” and “Wettability” (Ch. 8) were necessarily studied in terms of usage of both salt and water.

Constructional costs were high due to restriction on the materials for construction (Ch. 10) as the preservative was limited to boric acid only. That (Chs 1, 10) meant a smaller organisation originally considered preservation as limited only to larger groups.

The above represented the initial plants established for timber treatment in this State. The aim was to make the industry fully flexible and applicable to all types of organisations, irrespective of size.

Subsequent to installation of the high capital (Ch. 10) cost vacuum pressure systems, many plants were based on a central processing organisation and this explains (Ch. 14) the author advising general schedules unless specific plant operations were followed. Suppliers of these plants did, however, supply smaller units for lower production by individual mills.

1b. However for the initial Steam/Cold Quench established at El Arish (North Queensland), the sawn production was restricted to only one species, namely white cheesewood, *Alstonia scholaris* then preservative (boric acid) was incompatible with the available fungicides causing severe, uneconomic, losses through the major incidence of sapstains which made the treated product unmarketable.