VIII. A CANOPY OBSERVATION PLATFORM IN EAST KALIMANTAN, INDONESIA

Tropical biologists are often frustrated in their attempts to study plants, animals, and climate in the forest canopy because of the difficulty of access to this region 20-50 meters high. This problem can be overcome by the use of free-standing towers (Pasoh, Malaya; Barro Colorado Island, Panama) or by tree platforms (Ulu Gombak, Malaya). In April, 1978, we constructed a canopy platform and ladder at our study site in the Kutai Nature Reserve, East Kalimantan, Indonesia, to collect data on forest phenology and the travel paths of arboreal birds and mammals. Since our 39 meter-high platform and ladder are economical to construct and safe to use (desirable features) we describe its construction here in more detail.

We selected a large (180 cm dbh) Shorea situated on a sloping ridgetop so that the platform commands a view over the forest downslope and into the crowns of trees upslope. This tree has 32 meters of clear bole to where it divides into two large ascending secondary trunks. Access to the crown was gained by having one of our Indonesian assistants climb a smaller adjacent tree, cut off its crown, and shoot a nylon line over the lowest limb of the Shorea using a slingshot. This nylon line was then replaced with a 9 mm climbing rope. Both ends were tied to a tree near the ground.

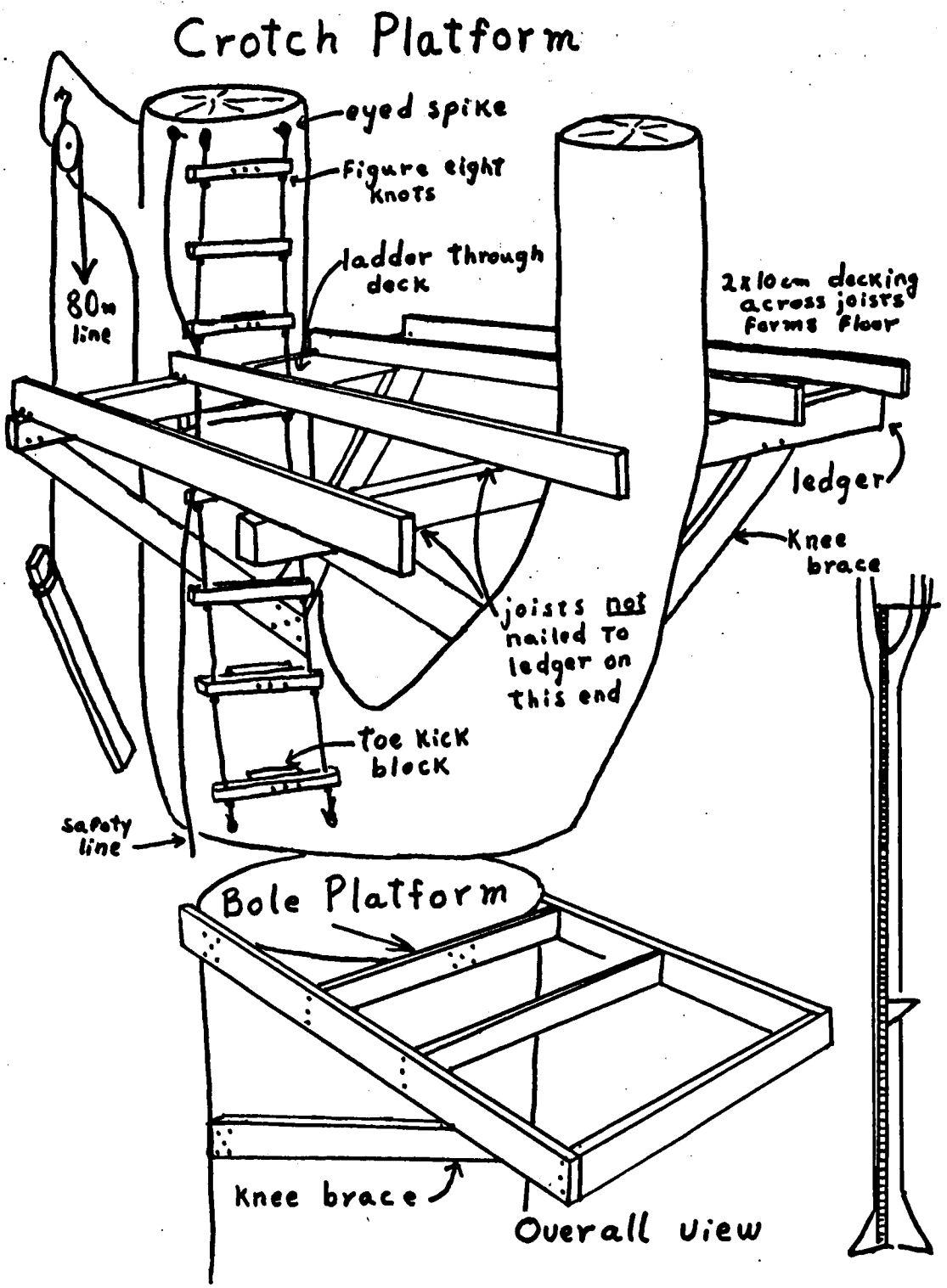
B. Thomas then ascended this free hanging rope by utilizing two ascenders, one attached to a sling seat with a short line, the other to a loop large enough for both feet (an ascender is a tool attached to a rope that will slide up the rope but not down). The climb was made by repeating a two step procedure. First: sitting in the sling seat while simultaneously raising the feet and sliding the ascender attached to the foot loop up the rope. Second: standing erect in the raised foot loop and sliding the ascender attached to the sling seat up the rope. Repeat gaining 25 cm per sequence.

We caution readers not to attempt this climbing technique without considerable practice in low trees. Recent books on mountaineering and spelunking illustrate the necessary equipment and techniques.

For safety, dead wood was knocked down from above the platform before construction began. Note that all living branches were left in place although they are truncated in the drawing to add dimension.

At 15 m high a preassembled 1 m^2 bole platform was nailed to the tree. Two 30 cm long, eyed spikes were driven into the tree and a pulley was used to raise a preassembled section of ladder which was secured to the spikes with a bowline knot. In a similar fashion two more sections of ladder were positioned — one covering the distance up to the crotch, and the other spanning the final 3 meters to where it enters the floor of the platform.

These ladders now serve as the permanent means of access to the canopy platform. The sides of the rope ladder are of 12 mm polyethylene rope, knotted (figure eight knot) every 40 cm to support the rungs. Rungs are from locally sawn 5 x 7 x 50 cm red meranti (Shorea) lumber. The rungs are


Crotch Platform
eyed spike
Figure eight knots
ladder through deck
2x10cm decking across joists forms floor
80m line
ledger
Knee brace
joists not nailed to ledger on this end
Toe kick block
safety line
Bole Platform
Knee brace
Overall view

strung along the rope sides through holes bored at each end. Every second rung is nailed to the tree, with another 5 x 7 x 25 toe kick in between the rung and the tree to stabilize the ladder and form a more secure foothold. Before nailing the rungs the ladder was stretched taut and anchored at the bottom. This keeps the supporting knots tight and makes the ladder easier to climb.

The crotch platform (2 x 2.5 m) is made entirely of lumber. Knee braces, ledgers, and joists are 5 x 10 cm; 2 cm thick planks deck the floor. Knee braces nailed to the two trunks support the ledgers which in turn support the joists of the platform. Only one end of the joists are nailed to the ledgers. The opposite ends are constrained from slipping laterally but are not nailed to the tree; thus, torsion of the trunks caused by strong winds will cause the joists to slip like sled runners on the ledgers but will not break up the platform. The total cost of material was under US$ 250; for 2 m^2 lumber ($ 175), 200 m polyethylene rope ($ 50), and 10 kg of nails ($ 12).

The mechanical ascenders originally used for climbing the rope have been incorporated as safety devices used while climbing the ladder. The movable lever-like brake of the ascender is attached by 20-50 cm of line to a belt of nylon webbing tied around the climber's waist. The ascender attaches to the safety line which hangs besides the ladder and reaches from the highest platform to the ground. While climbing up the ladder, the ascender slides easily up the safety rope; while climbing down it's simple to release the brake on the ascender and slide it down. At any time a fall from the ladder would force the ascender's brake to close and the fall would be limited to the length of line between the ascender and the safety belt.

Now, after 16 months of use, all wooden parts remain sturdy. We presume that they would begin to need replacement after 2½-4 years. We have experienced no problems with animals eating either rope or wood. A blind was immediately constructed on top of the platform and resembles a small house, with walls and roof from thatched palm leaves, and removable windows of mosquito netting. Enjoyable nights are spent above the forest canopy in a hammock strung within the blind between the two tree trunks.

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