

## The Botanical Parapegma

An Annual Calendar for the Climate Garden

By Jonathon Keats

A botanical parapegma is an annual calendar that is calibrated by the lifecycle of an annual plant such as a sunflower or chickweed. The months are named after important events in the plants' lifecycle, including germination and propagation, and days are sequentially counted until the next event is observed. For instance, the 23rd of Florescence would fall twenty-three days after the plant was first observed to blossom. If the plant started going to seed on the following day, the month of Florescence would end and the new botanical date would be the 1st of Propagation.

Because events in the lifecycle of a plant are influenced by climate conditions such as temperature and precipitation, close observation of any given plant species from year to year can reveal changes in the environment, including the local effects of global warming. Observing these changes from a plant's perspective can sensitize humans to climate conditions, and to the impact of changes in climate on ecology. Providing a living alternative to the standard Gregorian calendar, the botanical parapegma invites people to go onto plant time. Operated by hand and guided by eye, the parapegma encourages daily situational awareness, and also attentiveness to the long-term impact of anthropogenic activity, helping people to become more responsible stewards of nature. For those who decide to adopt botanical time as an alternative to the time kept by mechanical and atomic clocks, the impact may be even more profound, since the arrival of the next botanical month isn't completely predictable. It is up to each individual to decide whether this variable biological time system is more or less valid than the evenly-paced time measured by physics, and whether this way of life is more primitive or more advanced.

While botanical parapegmata are ideally suited for long-term placement in an outdoor environment, the Climate Garden provides a meaningful context for short-term experiments in botanical time reckoning. Botanical parapegmata can in turn enhance people's engagement with the Climate Garden concept and the flora within. To appreciate the complex relationship between climate and life, and to foresee how climate change might impact plant life in the future, a parapegma is set inside each Climate Garden greenhouse at the beginning of the season. In both spaces, the parapegma is placed next to the same species of annual plant. Every day, a volunteer makes a close observation of the plant to see whether it has transitioned to the next stage in its lifecycle, and records the observation by advancing a peg. The same peg is advanced daily until a floral transition is observed, at which point the peg is left in place and a new peg is added to the board to be advanced daily over the following botanical month. The pegs are labeled with the names of the botanical months so that the botanical date may be read by counting the number of spaces that the newest peg has been advanced. Depending on the style of parapegma chosen, the human timekeeper may also be responsible for updating a separate written calendar that can be instantly read by visitors to the Climate Garden.

The word *parapegma* comes from Greek, and parapegmata were used by ancient Greek societies, albeit not in the way that the botanical parapegma has been designed. (They were used to record astronomical time, in order to keep count on cloudy nights, and keep tabs on astrological phenomena.) The great age and long history of this technology – fundamentally comprising moveable pegs on a board – invites periodic reinvention and near-infinite variation. The following instructions and associated diagrams are offered only as a preliminary suggestion. It's up to each maker to make the botanical parapegmata evocative in his or her own space.

## **How To Make A Simple Botanical Parapegma**

*Note: Make one parapegma for each Climate Garden greenhouse.*

- 1) Cut a 30 millimeter thick plywood board to measure 1 meter on each side. Sand it smooth.
- 2) Inscribe a circle with a diameter of 80 centimeters on the top surface.
- 3) Drill 366 evenly-spaced holes around the circumference of the circle. Each hole should be 5 millimeters in diameter and 20 millimeters deep. Drill 4 additional evenly-spaced holes of the same size in a straight line below the circle.
- 4) Paint the board the color of your choice, stenciling the name of the plant that you will observe in the color of your choice on top of the circle. If you anticipate high humidity, use weatherproof paint to prevent moisture damage.
- 5) Saw a 5 millimeter wooden dowel into 4 segments, each 80 millimeters long. Sand them smooth and paint them the color of your choice.
- 6) Inscribe the sides of the pegs with the names of the four floral months: Germination (or Sprouting), Florescence (or Flowering), Propagation (or Seeding), and Dormancy (or Death).
- 7) Insert the month pegs in the four holes beneath the circle.
- 8) Place the parapegma next to the plant you will observe. On the first day of sprouting, withdraw the Germination peg, place it in the hole at the top of the circle, and start counting the days.
- 9) Advance the Germination peg clockwise daily until you observe blossoming. On that day, leave the Germination peg in place and take the Florescence peg from its hole at the bottom of the board and set it in the next hole on the circle. Advance the Florescence peg daily until you observe the first seeding. On that day, leave the Florescence peg in place, and take the Propagation peg from its hole at the bottom of the board and set it in the next hole on the circle. Advance the Propagation peg daily until you observe plant death. On that day, leave the Propagation peg in place and take the Dormancy peg from its hole at the bottom of the board, advancing it daily until the Climate Garden is dismantled or you see new sprouting.
- 10) If a new cycle of sprouting is observed before the Climate Garden is dismantled, or if the Climate Garden is to be tended over multiple years, the cycle begins again where it ended. The Germination peg is moved to the hole following the final destination of the Dormancy peg and the three other pegs are set back in their holes at the bottom of the board.

## **Optional Written Time Display**

You may add a written calendar to the middle of the circle. Although this calendar will not show the relative lengths of the botanical months, it will increase legibility. In its simplest form, the board is painted with chalkboard paint and the botanical month and day are handwritten in white chalk. Every day in a botanical month, the numerical date is erased and the new date is written in its place. When the next month arrives, the written name of the month is also changed.

## **Variations**

**Materials:** Instead of plywood, the parapegma board may be made out of solid wood or particleboard. Other options include urethane, aluminum and stone. Lettering may be engraved or incised instead of being painted on the surface. The pegs may be made out of brass or another metal instead of wood. They may be fitted with flat heads to provide space for engraving the names of the floral months on top instead of the side. Engraved metal tags may be used for the central time display instead of chalk. These may be placed flat on the surface or hung from hooks.

**Scale, Shape, Orientation, and Finish:** There are no limitations on the scale, shape or finish of the parapegma board beyond the practicalities of fabrication. The board may be horizontal or vertical or tilted as space allows.

**Floral Months:** The lifecycle of a plant may be subdivided into more than four units. For instance, depending on the species selected, leaf unfolding may be distinguished from sprouting, or the stages of fruit ripening can each be identified by name.

**Additional Calendrical Information:** You may add other temporal indications to the board, such as a solar or lunar calendar, or indications of solstices and equinoxes.

**Additional Parapegmata:** More than one parapegma may be made for a Climate Garden greenhouse, facilitating comparison between plants to supplement comparison between climates.

The botanical parapegma is a platform for exploration of and experimentation with time. Additional permutations are encouraged. Please share your parapegmata by emailing the Plant Science Center.