HISTORY OF UNDERSTANDING OF PHOTOSYNTHESIS

Keeton's 3rd, pp. 139-145, Campbell's 6th: 176-185, Sadava, pp 160-166, Campbel 9th: 184-189, 10th: 185-207 (v. little history...)
Revised 6 July 2016

Aristotle	~300 BC	observation: plants grow in soil. Deduced **plants get their mass from soil**.
van Helmont	1577-1644	Planted willow in pot with 200 pounds earth. Added only water. Increase in 5 years: 164 lbs,. Loss in pot: only 2 oz. Conclusion: **plant weight gain is from water**
Priestly	1733-1804	1771: candles "damaged" air; also a mouse damages air... Both "died" in sealed bell jar. postulated phlogiston (unit of fire) released. **Regenerate air with mint** in 10 days so that candle would burn. *i. e.*, plants cleanse and purify air. He published his results, BUT... Colleagues could not repeat, nor could he...
Ingen-Housz	1730-1799	Discovered that ***light* was necessary for "repair" of damaged air**. **Noted also** that at night (in dark), plants also damage or "poison" air.
Lavoisier	1743-1794	measured CO_2 produced by animals, found **CO_2 released is proportional to work performed**, likewise O_2 consumed. **Generic aerobic respiration:** $CH_2O + O_2 \rightarrow H_2O + CO_2\uparrow$ + energy
Ingen-Housz	1730-1799	suggested that in sunshine, plants absorb the C from CO_2 , throw out the O_2. [NOT...]
de Saussure	1767- 1845	showed that **equal vol of O_2 and CO_2 are exchanged**. Also**, plant gained *more* wt than just C, rest from H_2O**.
Photosynthesis: $6CO_2 + 6H_2O$ + energy → $C_6H_{12}O_6 + 6O_2\uparrow$ [actually $6CO_2 + 12H_2O \rightarrow C_6H_{12}O_6 + 6H_2O + 6O_2\uparrow$)]		
F. F. Blackman	1905	Because increased temp increased rate of photosynthesis even with identical light, concluded **two sets of reactions: one light dependent, one enzymatic**.
C.B. Van Neil	1930s	Photosynthetic bacteria using H_2S give off sulfur rather than O_2. Concluded: **oxygen in CH_2O does not come from H_2O**, but fr CO_2. General: $CO_2 + 2H_2A$ [CH_2O] $+2A + H_2O$
Calvin	1946	elucidated dark reactions:(Nobel prize) LEARN: **reductive carboxylation** 1) used C14 **radiotracer** to label initial product 2) separated products using two dimensional **chromatography** 3) located labeled (initial) product with **autoradiography**