

of position in flowers and leaves. Soon afterwards the number of known cases of plant-movement was considerably increased.

The degeneracy of vegetable histology towards the end of the eighteenth century, and the dominance of the vital-force theory, combined to hinder further progress in regard to the movements of plants. A return to scientific method, however, was well marked in the experiments of Andrew Knight (1758-1838), an English horticulturist and worthy successor of Hales. He showed that the upward growth of stems and the downward growth of roots were opposite reactions to the same stimulus—"the force of gravitation"; that when germinating plants were grown on a revolving wheel the radicles were directed outwards, in the direction of the "centrifugal force", and the young stems inwards; that the stimulus supplied by moist earth may affect roots more strongly than that of gravity; that the tendrils of the vine and Virginian creeper grow away from the light (negative heliotropism); and so on.

In 1827, while still a young student, Von Mohl published a remarkable essay on tendrils and climbing plants, "the best that appeared on the subject before Darwin wrote upon it in 1865" (Sachs); Dutrochet extended Knight's experiments with the rotating wheel, and attempted to apply his theory of diffusion to the phenomena of movement; and Brücke in 1848 made a classic research on the sensitive plant, distinguishing the periodic movements from the responses to casual stimulus, and attempting an analysis of both in terms of tension and turgidity. These and other investigations were of much interest, yet Sachs ends his historical survey by remarking that "scarcely any point of fundamental importance in phytodynamics was cleared up before 1860".

There is no greater name in the history of modern botany than that of Julius von Sachs (1832-97), and he has probably had a wider influence than  
 Sachs. any other. Not only have many of the most prominent living botanists sat at his feet, but his books have brought us all into touch with him. He was