tain whether the exposure of the plate to the transmitted rays and to the secondary rays must be simultaneous, but has been unable to produce the anomalous effect by successive exposures, that is, by an exposure first with the upper coin in place followed by another exposure with this coin removed and the lower coin in place. No vestige of cancellation could be found.

F. R. Gorton

THE ACID SPOTTING OF MORNING GLORIES BY CITY RAIN

That the trees, shrubs and flowering plants in our large cities and in the country along our trunk-line railroads are subjected to conditions which cause unhealthy growth and disease has been proven abundantly. Large factories, power plants and railroad locomotives are pouring out volumes of smoke, which alone is highly injurious, but in addition the acid which is formed in the combustion of coal, when dissolved in rain water, has injurious effect upon foliage and other plant parts. Its action is seen in the corrosion of tin roofs, rain pipes and ornamental iron work about city houses.

The following note is of interest to the plant pathologist and plant physiologist. During the night of September 19, 1913, a light rain fell, followed by a fine drizzle in the early morning of September 20. The wide-open campanulate flowers of the common morning glory (*Ipomœa purpurea* Roth), growing on a lot in West Philadelphia, four or five blocks from the Pennsylvania Railroad, had their usual quota of raindrops studded over the upper, inner surface of the purple corollas. Wherever the drops touched the surface of the corolla, the purple color was changed to a pinkish red, and in the process of evaporation of the raindrops the acid of the drops was concentrated, so that after the complete disappearance of the drops a brown spot was left in the center of the pinkish red circles of discoloration. The explanation of the alteration of color is found in the change of the sap of the corolla cells, where touched by the acid raindrops, from an alkaline to an acid reaction. A similar change can be induced in blue violet petals by bruising them slightly and placing them in an acid liquid. The petals change, like blue alkaline litmus paper, from blue to red, and this reaction with violet petals has proved useful in the physiologic laboratory in the absence of litmus paper. In nature a reverse change, which illustrates the same chemic principle, takes place in many flowers of plants belonging to the family Borraginaceæ. For example, in *Symphytum* and *Mertensia,* the red flower buds, the cells of which have an acid cell sap, gradually change to blue as the flowers open. That this is a chemic change is proved by treating the red buds with an alkaline fluid and the blue flowers with an acid one.

Similar spotting, but less clearly discernible and demonstrable, as the delicate reaction with morning-glory flowers, undoubtedly occurs on leaves and fruits, and the suggestion is made here, that such spots caused by the acidity of raindrops serve repeatedly as the points of entry of parasitic fungi, for there are many leaf spots and fruit spots that show concentric rings of diseased tissue in the earliest lesions produced. A fungus, which is stimulated to growth by an acid condition of the cell sap, would find ideal conditions for the commencement of growth by entering areas influenced by acid raindrops.

John W. Harshberger
University of Pennsylvania

SCIENTIFIC BOOKS

The Genus Iris. By William Rikatson Dykes. With forty-seven colored drawings by F. H. Round, one colored plate of seeds by Miss R. M. Cardew and thirty line drawings by C. W. Johnson. Cambridge, at the University Press. The University of Chicago Press, Chicago, Ill. 1913. Demy Folio. Pp. viii + 246. Price £6, 6s. net.

Thirty-six years ago J. G. Baker published his "Systema Iridacearum" in the *Journal of the Linnean Society,* including a revision of all the genera of the family. In this paper the genus *Iris* was made to include 81 species, distributed among six "sub-genera," namely, *Apogon* (33 sp.), *Onocyclus* (5 sp.), *Evansia*

(6 sp.), *Pogoniris* (31 sp.), *Hexapogon* (2 sp.), and *Dietes* (4 sp.). The genera *Xiphion* and *Juno,* excluded by Baker but since merged in *Iris,* included nearly 20 species, so that at that time the known plants now regarded as species of *Iris* reached about 100. A few years later (1892) when Baker published his "Handbook of the Irideae" the number of species was increased to 161, distributed among ten "subgenera" as he continued to regard them, as against six in his earlier treatment. Comparing Baker's disposition of the species with that of Dykes the greatest difference is to be found in *Pogoniris,* to which Baker assigned 52 species, while the later author assigns to it but 34 species. *Xiphium* with 14 species in Baker's "Handbook," has but 6 in Dykes's book. In some cases the later author has been unable to identify certain old names, while in others he has reduced them to synonymy.

American students have found Hasselbring's article "*Iris*" in Bailey's "Cyclopedia of Horticulture" very helpful. His treatment follows the general lines laid down by Baker, and includes 102 species.

Coming to the book before us one finds a far fuller treatment than had previously been accorded these plants, for here we have a botanical monograph of a generous type, in which there is successfully combined accuracy of scientific detail with popular directions to growers. To these matters of fact are added the exquisite colored drawings and fine printing and binding which make this a work of high artistic merit.

The botanist will notice that the author divides the genus into twelve sections, approximately equivalent to Baker's "subgenera." In eight of these the underground portion of the plant is a rhizome, while in the remaining sections it is bulbous (a bulb or corm). This character at once divides the genus into two parts—the "rhizomatous *Irises,*" and the "bulbous *Irises,*" and after this the sections are distinguished by their "smooth," "crested" or merely "bearded" outer segments (falls), and the seed characters (arillate, non-arillate). One third of the species (49) are found in the section *Apogon* with rhizomatous plants, and smooth falls, and nearly one fourth (34) are in the section *Pogoniris* with rhizomatous plants, and bearded falls. In the first of these are *Iris versicolor, I. missouriensis, I. montana, I. verna,* etc., while in the second are *I. pumila* and *I. germanica,* of our gardens. The sections *Onocyclus* (rhizomatous, with sparsely bearded falls; 16 sp.) and *Juno* (bulbous, with smooth falls; 17 sp.), include less commonly known species. The plants of the *Juno* section look very unlike ordinary *Irises,* their leaves being channeled, instead of sword-shaped, and the standards are spreading, instead of erect. In the *Onocyclus* section is found *Iris lortetii,* of the southern slopes of Lebanon in Palestine, "perhaps the most beautiful of all *Irises.*" Its large flower is quite remarkable, with its nearly orbicular falls, orbicular, erect standards (3–4 inches in diameter) and arched, crimson-red styles. "Unfortunately it seems to be one of the most difficult to cultivate among the difficult members of its class."

This fine volume is destined to become the standard book on *Irises,* and on this account must be found in every botanical library, while its beautiful plates, fine paper, print and binding will cause it to find place in many private libraries.

CHARLES E. BESSEY
THE UNIVERSITY OF NEBRASKA

Thought and Things, or Genetic Logic. Vol. III., Part I. Real Logic. Interest and Art. JAMES MARK BALDWIN. London, George Allen and Company; New York, The Macmillan Company. 1911. Pp. xvi + 284.

This Part I. of Volume III. of Baldwin's "Genetic Logic" opens with a résumé of the conclusions of the other two volumes, "with a view to their bearing on the problem of reality." The "logic" of "affective experience" is discussed under the title The Logic of Practise, in Part III.; Esthetic Experience is discussed in Part IV.; The Modes of Immediacy are discussed in Part V.; and in a sixth part, the new term Pancalism (from the motto of the work as a whole, τὸ καλὸν πᾶν) is proposed as a name for the author's philosophy,