Christmas cactus, the red-bud or Judas tree, pink dogwood, phlox, cardinal flower, salvia and no end of other flowers. In Southern California one would include the bougainvillea.

Some red flowers, like the wild geranium, turn blue when exposed to ammonia and some do not. We do not yet know what substance should be added to the cell sap to stabilize the blue; but it should not be difficult to learn this. When we have done so, and when we have learned how to make a flavone photosensitive, we should be able to start with a plant which normally has red, white or blue flowers and make it flower either of the other two colors. We can make a hydrangea bloom red, white or blue; but this is not really a case of a patriotic posy, for we do not get the white by cutting off the ultra-violet so we are undoubtedly dealing with a different variety, as in the case of the white lilac.

It should be possible to ripen a strawberry without permitting any red color to develop. That would have no scientific value; but it would have news value.

When I was a boy we used to be told that a blackberry is red when it is green, but that is not necessarily true for a biochemist.

After the biochemistry of the anthocyanins shall have been straightened out people ought to start on the biochemistry of the carotenes and of lycopene. We know that the green tomato will turn red in the dark and of course there can be no ultra-violet light reaching the inside of the watermelon or of the pink-fleshed Texas grapefruit.

Willstätter and his successors have cleared up the chemistry of chlorophyll pretty well; but we still know very little about the biochemistry of chlorophyll.

Coming back to the anthocyanins, it is possible that zymin or reductase[13] is the enzyme or one of the enzymes that makes a flavone photosensitive. There is no proof of this as yet, but it may be true and will serve as a starting point.

SUMMARY

1. An explanation has been given for the effect of subdued light on the development of anthocyanins. This effect was observed by von Sachs and by Sorby seventy years ago. Nobody has made an exhaustive study of the subject, although Askenasy, Hugo Fischer and others have done work along these lines.

2. When a flavone is reduced to an anthocyanin, as with the Japanese quince, cutting off ultra-violet light prevents the formation of the anthocyanin.

3. When the anthocyanin is formed by the hydrolysis of a leuco-anthocyanin, cutting off of ultra-violet light will not necessarily prevent the formation of the anthocyanin. This occurs with the geranium.

4. We do not know at all approximately how many or which flowers belong to what I call the flavone type and how many or which to the leuco-anthocyanin type.

5. After the biochemistry of the anthocyanins shall have been worked out the botanists and chemists should concentrate on the biochemistry of the carotenes, the lycopenes and chlorophyll.

OBITUARY

JOSEPH SWEETMAN AMES

THE death of Dr. Joseph Sweetman Ames on June 24, 1943, brings to a close a long and eventful chapter in the history of Johns Hopkins University.

Dr. Ames' career is a striking example of a life devoted to one institution. Born on July 3, 1864, in Manchester, Vt., he went to Baltimore at the age of eighteeen to enter the university. He won his baccalaureate degree in 1886, spent a short time in study in Berlin, held a fellowship in physics at his alma mater in 1887 and 1888, was assistant in physics the two following years, and received his Ph.D. in 1890. After graduation he continued his connection with the university and rose rapidly through the positions of associate and associate professor to a full professorship in physics in 1899. Following Professor Rowland's death in 1901 he was made director of the physical laboratory. He filled this post for a quarter of a century, when he was made provost of the university. The culmination of his university career came with his appointment as president of the university in 1929. In 1934 he announced that he would retire the following year, at which time he was made president emeritus. Unhappily the period of his career as president coincided with the worst years of the depression with an increased burden of financial problems.

In only one important instance did Dr. Ames share his university allegiance with another institution. He became deeply interested in the development of aeronautics through his appointment by President Wilson as a member of the National Advisory Committee for Aeronautics in 1917. For twenty years he was chairman of the executive committee of that agency, and through his guidance the committee's facilities for aeronautical research were expanded until they now comprise three great laboratories—at Langley Field, Va.; Moffett Field, Calif.; and Cleveland, Ohio. The committee's laboratory on the West Coast is officially

[13] Paladin, *Z. physiol. Chem.*, 26: 81, 1908; *Biochem. Jour.*, 18: 15, 1909.

named in his honor, although his failing health never permitted him to visit it. In all the years of his membership in the National Advisory Committee for Aeronautics, and particularly from 1927 to 1939, when he was chairman, he made frequent visits to the committee's laboratory at Langley Field and gave to its operations the same meticulous care which characterized his university work.

Dr. Ames had the reputation of being blunt. To those who knew him well he was at heart the kindest of men. But to paraphrase one of the legends which surround the memory of Professor Rowland, Dr. Ames appeared to feel himself bound by an oath to speak the unvarnished truth as he saw it about the physical world, inanimate or not. Nevertheless, in any discussion he was preeminently fair. He would listen patiently to his adversary, whoever he might be. If he was thereby convinced that he had been in error, he would frankly admit it. If they failed to agree, he merely agreed to disagree, with no hard feeling of any kind. A meeting with a specified time schedule was to him an obligation to be met, and as chairman he carried it out to the minute, even if it left his unwary speakers gasping in the middle of a sentence, as it sometimes did. All this simply reflects the orderliness of his own mind. He had trained himself to present a subject in a logical way in a specified time and conclude it on the minute. Others could of course do the same if they would try hard enough. By sheer will power he conquered a speech impediment which troubled him much in his earlier years.

If former students of physics at Johns Hopkins were asked to name the outstanding characteristic of Dr. Ames, the answer would probably be his remarkable ability as a teacher. He was not primarily an experimentalist. In fact, the literature of physics contains very few investigations under his name. He was first and foremost a teacher in accordance with the best traditions of the university. The wide use of his text-book on "General Physics" was a tribute to the clarity of his exposition. He followed closely new theoretical and experimental advances in physics, and made every effort to keep his students informed regarding current developments. The journal meetings and seminars of the physics department under his personal direction were inspiring occasions, and the habits of thought there developed were destined to have a deep influence on the students who were privileged to participate.

So firmly did Dr. Ames hold to the importance and obligations of teaching that he continued to give his undergraduate courses in physics long after he became director of the physical laboratory. His classroom lectures were masterpieces of straightforward logical presentation. Even in his graduate courses he seldom referred to his notes. In his Joseph Henry Lecture before the Philosophical Society of Washington, which necessitated a manuscript for publication, he laid aside his manuscript at the beginning and presented his subject in characteristic style.

Dr. Ames was a member and past president of the American Physical Society; a member of the National Academy of Sciences; a fellow of the American Academy of Arts and Sciences and honorary member of the Royal Institution of Great Britain. He received the Langley Gold Medal in 1935 in recognition of his leadership in developing aerodynamic research. Washington College, the University of Pennsylvania and Johns Hopkins honored him with the degree of doctor of laws. He was a member of the Baltimore School Board and was president of the Baltimore Country Club for twenty years.

In 1899, Dr. Ames married Mrs. Mary B. Harrison. There were no children of this marriage, but he was deeply attached to his three step-children. Their home on Charlecote Place, Guilford, was a delightful place to foregather. He was a kindly and genial host and a skilful raconteur. After the death of Mrs. Ames in 1931 Dr. Ames lived alone in his home in Guilford until the end. A great teacher has passed to the realm of memory.

LYMAN J. BRIGGS

RECENT DEATHS

DR. WILLIAM FOGG OSGOOD, emeritus professor of mathematics of Harvard University, died on July 22 at the age of seventy-nine years.

DR. CARL EDWIN LADD, dean of the New York State College of Agriculture, Cornell University, died on July 23 at the age of fifty-five years.

DR. GEORGE FREDERICK KAY, professor of geology at the State University of Iowa from 1907 until early this year, dean of the College of Liberal Arts from 1917 to 1941, died on July 20 in his seventieth year.

DR. AGNES LOW ROGERS, formerly professor of education and psychology at Bryn Mawr College and director of the Phoebe Ann Thorne School, has died in Scotland. She was in her fifty-ninth year. Dr. Rogers had been professor of educational psychology at Goucher College and at Smith College.

DR. GEORGE ABRAM HARTER, professor emeritus of mathematics of the University of Delaware and president of Delaware College from 1896 to 1914, died in his ninetieth year on July 22.

CHARLES H. STERNBERG, collector of fossils and a contributor to museums in Munich, London, Paris, New York and Toronto, died on July 20. He was ninety-three years old.