bran), and thus effected a slight increase in the phosphorus content of the ration as indicated by the analyses of Klein and McCollum, we believe that this difference in the intake of phosphorus had nothing whatever to do with the development of caries. For one thing, it is extremely unlikely that diets such as ours, that have given very satisfactory results for growth, reproduction, and location, could be deficient in so essential an element as phosphorus. Moreover, diets containing oatmeal and having appreciably less phosphorus than the one considered by Klein and McCollum to be deficient in this element, have been fed without producing caries at all. It would appear logical to conclude, therefore, that the development of caries may, within certain limits at least, be independent of the phosphorus content of the diet.

In table 1 are recorded the results obtained with another type of diet that has been used in our studies on dental caries. The phosphorus and calcium values have been calculated from those used by Klein and McCollum. The data for the femurs and humeri have been included, because these values express accurately the ability of the diets to support calcification of the bones and teeth. Concerning the calcium-phosphorus ratios, it is obvious that these bear little relation either to the incidence of caries observed in the rats, or to the ash content of the bones. Moreover, there is no correlation whatever between the ash content of the bones and the incidence of caries. The development of caries in the rats was just as frequent on the corn meal diet that produced bones yielding 56.2 per cent ash as on the cornmeal diet that gave bones yielding only 43.5 per cent ash. In contrast to these results, caries was not observed in any of the rats receiving the oatmeal diets, whether the ash content of the bones was high or low.

These results permit of only one conclusion, and that is that variation in the phosphorus content of the diets in our experiments had no connection with the outcome. It has always appeared rather strange that whereas a deficiency in the diet, be it an inorganic element or a vitamin, caused *general* metabolic disturbances, the same deficiency should, in the case of caries, affect *one tooth* and leave the adjacent one untouched. It would be just as reasonable to expect one femur of a rat, on a deficient diet, to have an ash content of 40 per cent, and the other femur to have one of 55 per cent. The localization in the decay of teeth is most reasonably explained on the basis of action by certain factors exterior to the teeth. Until a more plausible explanation is forthcoming, we shall adhere to our original conclusions concerning the cause of the caries in our experiments.

THE DEVELOPMENT OF INTEREST IN IRIS IN THE UNITED STATES[1]

CLARENCE P. CONNELL
VANDERBILT UNIVERSITY, NASHVILLE

It is quite certain that our forefathers or rather perhaps our foremothers brought *Iris germania major* and *Iris germania alba* to their new American homes for, as early as 1780, backwoods sections of Tennessee and Kentucky had these iris in their gardens, loved them as blue and white flags, and gave treasured bits to neighbors and friends.

Early garden lovers in America received new iris from time to time. It would be interesting to know who were the first importers, what varieties they found available and to know if they were hampered by any older sister of Article No. 37 (Federal Horticultural Board Regulations). Such varieties as Mme. Chereau, Celeste, Jacquisiana, Honorabilis and Queen of May were to be had about 1850. In 1900, the available list was greatly enlarged. Such firms as Vilmorin and Perry were regularly introducing varieties as Black Prince, Caprice, Isolene, Maori King.

From this time on introductions came fast. In 1910, Goos & Koerneman had introduced their still popular favorites Iris King, Rhine Nixe Lorelei and a host of sisters. Sir Michael Foster had laid the splendid foundation for his work which began in 1872 and continued until his death in 1907. Such varities as Caterina, and later, Crusader, Lady Foster, Kashmir White and others that are still unsurpassed.

In 1910, Bertrand Farr gave us his first list; Miss Grace Sturtevant soon followed; and then came E. B. Williamson with his variety Lent A. Williamson. From this period forward the race was fairly on.

Just prior to 1920—largely because of the introductions of Bertrand Farr and his widely circulated catalogue and the iris exhibited by Miss Sturtevant at the Massachusetts Horticultural Shows—iris interest burst into a popularity which resulted in the organization of the American Iris Society on January 29th, 1920.

Bulletin No. 11 of the American Peony Society, published in April, 1920, was dedicated to the newly born American Iris Society. The organization was announced with John C. Wister, President, and R. S. Sturtevant, Secretary. These two guiding stars are still in the

[1]Read before the Tennessee Academy of Science at the Knoxville meeting, May 8, 1931, by J. T. McGill in the absence of the author. Mr. Connell consented to the importunity of the Editor by allowing this informal talk to be published in the hope of stimulating interest in the growing of these lovely plants in Tennessee.—J. M. Shaver.

forefront of all the work of the society. The Secretary made the following announcement:

> To promote the culture and knowledge of Irises, to straighten out nomenclature, to encourage the breeding of newer and finer sorts, is a brief statement of our aims; we plan to concentrate the stray bits of information and place them at your disposal. Such a special study whether it be of peonies or irises, roses or what you will, gives a background that adds greatly to the joy of a garden and may make the garden and its associations of wider interest.

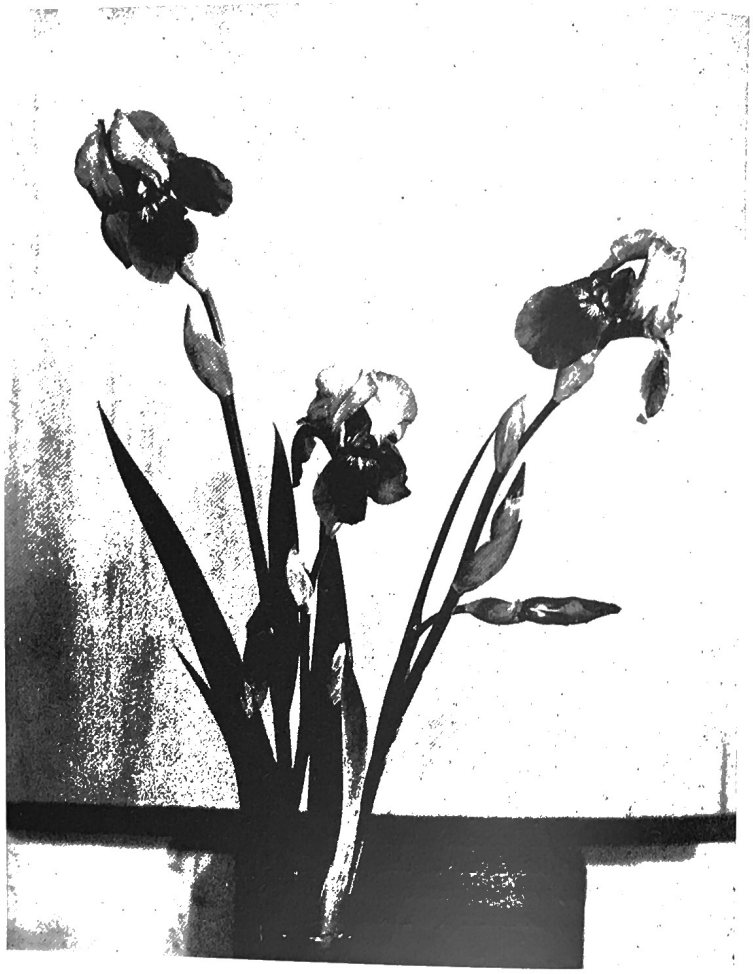

Fig. 1. Iris: Dauntless. Winner of the Dyke's award in 1929. Produced by Mr. Clarence P. Connell of Nashville.

Courtesy of the Peabody Reflector and Alumni News.

Fig. 2. Iris among an open growth of Black Locust trees on the campus of George Peabody College for Teachers.

Mr. Wister was discharged from the army in Europe. He had read in the English garden magazines accounts of splendid iris seedlings to be seen in France and England. Mr. Wister visited these European gardens and published his notes in The Bulletin. From the reading of these notes made on this visit, real and intense enthusiasm spread out all over the land. Well do I recall my own excitement and my hurried letter to Mr. Wister, whom I knew not at all. Poor man, he must have been deluged with such letters.

Fig. 3. Vases add to the interest of the garden and become handy places in which to hide faded flowers.

In these early days, iris notes were collected by the Secretary and published in a monthly magazine, *The Flower Grower*. Well does the writer recall the impatient wait for the next number. In June, 1920, our first real Bulletin was published. The subject discussed was *Culture of Iris in the United States*. Iris growers from every section contributed notes on their experience in growing the Iris. Louise Bebe Wilder wrote on *American Native Iris* almost our first information on native iris. I quote one sentence: "The First American Iris that grew in my garden was *Iris cristata*, which, more shame, I did not know as a compatriot and I had imported from Holland."

In Bulletin No. 2, Mr. Ernest Krelage of Haarlem, Holland—one of the world's best informed nurserymen—discussed *The Development of the Tall Bearded Iris in the 19th Century*. This is a remarkable historic note well worth reading. Mons. Denis also wrote of his work with *Iris ricardii* as a parent. I have worked with Ricardii and with Ricardii Hybrids. They are fascinating and I strongly urge them upon those growers or hybridizers whose climatic and gardening conditions may be combined with patience.

In this same Bulletin, Mr. William Mohr is first mentioned. As we go forward, we will find Mr. Mohr again. Here, Miss Sturtevant gives us some notes from her hybridization records. She has excellent intentions and notes that Isoline is sterile. I had an attachment for Isoline at that period and could not believe that my favorite was sterile; hence, I set out to disprove Miss Sturtevant's charge. I made some 1,000 crosses, harvested a pint of seed, raised to flowering 500 plants and discarded—even burnt—the whole lot. They were the most misbegotten children that ever disgraced an iris world. My respect for Isoline dropped to almost zero and has remained there since.

Fig. 4. Iris: San Francisco. Winner of the Dyke's award in 1928.

For the first time, we now discussed apportionment of points to be used in judging or expressing iris value. At this time we also attempted an informal symposium on about 150 varieties, but nothing came of this.

In the next two Bulletins, came notes of the life and work of Sir Michael Foster. Sir Michael was certainly the founder of modern iris breeding. His careful scientific work established our future course, and the hybridizers of today have followed the direction pointed out by this scientist whose recreation was in his flowers. It has recently been my good fortune to spend some weeks with Sir William Hardy of Cambridge University, England. Sir William was a pupil of Sir Michael and told many delightful stories of the great physiologist.

Fig. 5. Iris planted in border clumps along wide grass paths.

In the Bulletin, Mr. Wister gave his notes on American Iris growers and gardeners. I note that he says the iris, Quaker Lady, will be long in our gardens. Later he notes iris, Cygnet. I used to quarrel often with Wister in his iris judgments. Time has shown, however, that he is often right; seldom wrong.

In early 1922 there were 650 members and nearly everyone an enthusiast. They were inspired by Wister's notes of new European and American iris. They were clamoring for information about their favorites. Where could new varieties be procured? What did

they look like? Were they advances or duplications? Discussions about high prices raged. To answer some of these questions, a check-list was published. This was soon followed by the first symposium, which attempted to fix the comparative value of known varieties.

I recall the events which led to the symposium. I had imported and bought every new iris that my slender means could procure. I felt as if I had invested a million. Then they bloomed. You cannot

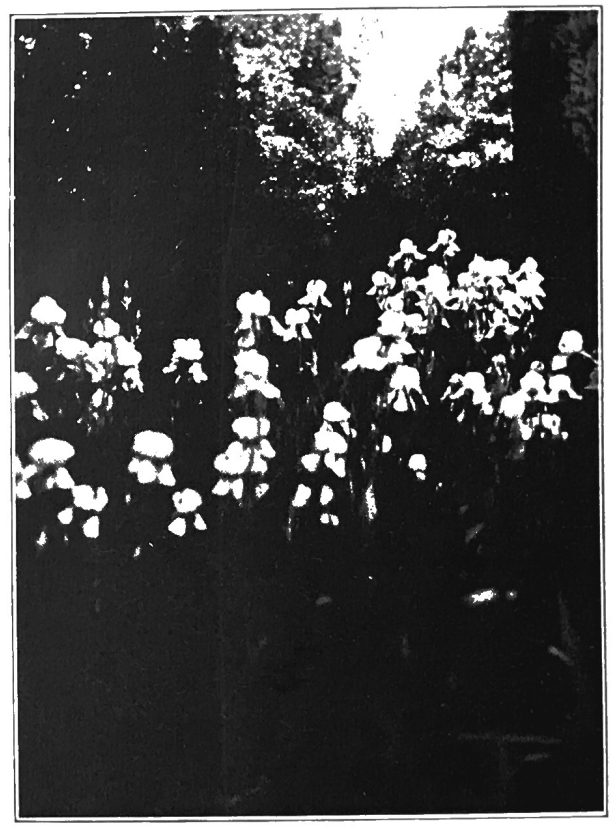

Fig. 6. Iris with contrasting height and form to add interest.

picture my disillusionment when I found that many of my hard bought treasures were no better nor very different from well-known, old iris. I immediately placed the blame on Wister and wrote him an indignant letter, telling him that the Society was a failure, that it gave its members no information and no protection against unscrupulous introductions of trash. His terse reply was to the effect of "well, what are you going to do about it?" It was up to me. A jury of judges was suggested and out of it came our first symposium.

This was an important milestone for it fixed a standard of relative values. The next few Bulletins fixed other fundamental conditions, such as accurate color, standards and nomenclature, accompanied by careful descriptions of well known varieties. Mr. Wister attended the International Iris Conference in Paris. This was in May, 1922. Further notes on European novelties came from Mr. Wister. You will note, that at this time, almost every worthwhile American novelty, with the exception of Lent A. Williamson, came from our pioneer Miss Grace Sturtevant, or from Bertrand Farr. Mr. Shull wrote a short scientific article on the chemistry of color, bud formation and principles of division. Up to this time, only the tall bearded iris were much discussed. Then Bulletin No. 11, in 1924, contained data on beardless iris. About this time the iris borer cloud was recognized on the horizon. I have mentioned, Wister, Farr, Miss Sturtevant, and Mr. Shull several times. Now new names began to appear: Mrs. McKinney, Bonnewitz, Morrison, Mrs. Peckham, Frank Campbell, Mrs. Hires, Arthur Scott, Sass Brothers, Dr. Kirkland, Dr. Scott, Mitchell, Wareham, Mead, Dr. Ayres, Mrs. Pattison, Bruce Williamson and many others.

In late 1924, Mr. Bertrand Farr died. I wonder how many here recall with excitement Mr. Farr's first catalogue in color. I still have mine, a cherished possession. The society later organized as a memorial, "The Farr Circulating Library." This collection of books contains important and useful works on Iris and is available to every member of the society.

The next important step was the establishment of a trial and display garden policy. Articles of agreement were compiled and opportunities to establish these gardens were offered to interested communities. The establishment of these gardens has done much to popularize iris.

Iris fanciers are asked to contribute notes on their observations. These notes have been compiled under the title of "Tid-Bits." They are always fresh and interesting and appear as gossip in each Bulletin. At this period the first scientific notes on sterility were published. The American Iris Society was the first flower society to undertake and support scientific research. The Bulletin is highly technical and dry reading.

Japanese iris next came in for discussion in late 1924 and have been ably written up by Prof. Miyazawa. Mons. Denis, a French hybridist, again writes interestingly of his work on production of white iris.

December, 1925, brought another serious loss to the iris world in the death of Mr. W. R. Dykes. Mr. Dykes was Secretary of the Royal Horticultural Society of England and was perhaps the world's greatest authority on iris. His great work *The Genus Iris* is an encyclopedia of accurate information. The entire Bulletin of

April, 1926, was devoted to an account of the work of Mr. Dykes. His last Iris introduction, W. R. Dykes, named post-humously, is one of our best yellows.

The Bulletin of July, 1926, contained an interesting historical article by Mr. Morrison (quoted largely from Gerard's Herball)

Fig. 7. Iris: Copper Lustre. A beautiful new Iris produced by Chancellor J. H. Kirkland of Vanderbilt University, in 1931.

together with pictures as published in these early journals. Next came a Bulletin with exhaustive studies on sterility and fertility. As

always this Bulletin was enlivened with notes, this time from Mr. Pilkington, Secretary of the English Iris Society and Mr. Duffy.

By January, 1927, exhibitions had become so numerous that it became necessary to formulate an exhibition policy. This fine work was done by Mrs. J. Edgar Hires, who continues the work as Chairman of the Exhibition Committee.

This same year the iris, Morning Splendour, introduced by Mr. Shull, was awarded the silver medal offered by the Garden Club of America for the finest variety of 1923 introduction. This was a signal honor to Mr. Shull who had done so much fine work for the Society. It might interest you to know that Mr. Shull has kept intact all of the proceeds from the sale of this iris. This fund is to offer a college education for a young Shull. One Bulletin was given over to the planting of an ideal iris garden; a dream garden, a sloping hillside, a meandering stream, silver lake, dark cedar trees, companion flowers, color combinations, etc.

Again the Society suffered loss by death of Mr. Arthur Scott, a kindly genial spirit and a lover of flowers and gardens, who had done much to advance the interest of the Society. Mrs. Scott has endowed an Arboretum at Swathmore College as a memorial. Mr. Wister is the consulting director. In July, 1927, the English Iris Society awarded the Foster Memorial Medal to Mr. John C. Wister, President of the American Iris Society, for his distinguished and enthusiastic work in the American Iris Society. The English Society also decided at that time to establish the Dykes memorial medal to be offered to the best new—not hitherto in commerce—American iris of the year. One such medal is also awarded in France.

The first award was presented to Mr. William Mohr and Sidney Mitchell for their iris, San Francisco, in 1927.

San Francisco, the big new type plicata, is not a break or accident of plant breeding, but was carefully planned for and its advent confidently predicted by Mr. Mitchell before its first flowering in his garden. Some articles by Mr. A. J. Bliss in the Gardners' Chronicle on breeding plicatas and a suggestion by Miss Grace Sturtevant resulted in a discussion between Mr. Mohr and Mr. Mitchell on how to get bigger and better plicatas. The result was that Mr. Mohr made certain crosses between his seedlings of part plicata parentage but wholly self colors, and though his untimely death prevented his seeing the results, they were as expected. The plicata color pattern is a recessive, and in the second generation it appeared according to the Mendelian ratio. Theoretically at least it is possible to make plicatas to order; indeed a big plicata with red purple instead of lavender markings has just flowered in Mr. Mitchell's California garden, and he expects colored ground ones to follow in later years.

The parentage of San Francisco is [(Juniata cross mesopotamica) cross Parisiana] cross (mesopotamica cross Parisiana). Comparison with all earlier plicatas is futile, as it is in a class shared only by its own sisters and cousins, Los Angeles being the only other one yet in commerce. It is a great big flower of fine substance and lovely shape, its white ground standards heavily suffused and edged lavender, its wide flaring falls almost pure white, the blue reticulation being confined to the haft, where it merges into reddish brown. A jury of American Iris Society members rated it in 1926 at 96, not in comparison with older plicatas but with other fine varieties in the large flowered types.

In 1928, no introduction was judged worthy of such an award but in 1929, Mr. Connell's Iris, Dauntless, was given the Dykes medal. This iris is one of the near approaches to red. Iris Blue Velvet was "runner up" this year.

By 1929, iris exhibitions had become so numerous that almost whole Bulletins were given up to notes made by judges and other interested observers. Again there appeared notes of European iris, made this time by Mr. P. C. Morgan, who noted iris, W. R. Dykes, as supreme yellow. Other notations were of Sir Michael of Mr. Yeld, Mr. Bliss' Grace Sturtevant, a white, Micheline Charraire, and pink, Mlle. Cecil Bouscant. In America, twenty five official shows were held under the auspices of the Society. They ranged from Massachusetts to California and from Michigan to Alabama. These shows were all large and sometimes expensive. They furnished an index to the growing popularity of this excellent garden flower. In the next Bulletin, the Early Dwarf Bearded Iris had their inning. These small fellows were little known. These notes indicated the value of these plants of fine color and vigorous constitution for new rock gardens.

Photo by Mattie Edwards Hewitt.
Fig. 8. The unique Iris bowl on the estate of Mr. and Mrs. Horatio Gates Lloyd at Haverford, Pa.

The next Bulletin, No. 28, dated July, 1928, brought out a new symposium. This symposium was compiled from the work of about fifty jurors. Old ratings were revised and hundreds of new ones added. It was attempted, in this list, to give the garden rating as well as the exhibition rating. By carefully following these ratings,

which are used in all good iris growers' catalogues, you can be assured of a chance to purchase discriminatingly. If the Society had done nothing more than issue this symposium, its existence would have been justified.

In the next series of Bulletins, there appeared iris garden plantings, designed by R. S. Sturtevant, Secretary of the Society and of the Groton Landscape School.

In the Bulletin of April, 1929, Mr. Franklin B. Meade contributed an article on *Judging the Judges*. Sober judges were raked over hot coals, but to show you how well we like each other—we iris folk—Mr. Meade was never cited for contempt.

Mrs. Peckham touched a new note in an article on iris for table decoration. An anonymous contributor suggested some good names for new iris such as Foaming Ale, Saw Horse, Wunlung, Suffren Kats, White Mule and others equally descriptive of beautiful new seedlings.

If anyone suppose that it is an easy task to select good names for new iris, let him try to write fifty good names and then take a check list and see how many have already been pre-empted. My percentage is about one in ten. In 1928, Mr. G. M. Reed of the Brooklyn Botanic Garden spent several months in Japan. The Bulletin of July, 1929, gave a record of his observations on the Japanese iris. In this Bulletin we find first mention of a super yellow iris from France, called Pluie d'Or or Golden Shower. Other new iris were interestingly commented upon by Mr. Duffy who spent some time in Mrs. Pattison's good collection at Freeport, Illinois.

American hybridists by the score have entered the lists. Their productions equal, even excel, those of their European competitors. Each year hundred of thousands of seedlings are produced. Out of this mass of new material, a few score are selected and named.

To the amateur buyer, I might sound a note of warning against the purchase of these new and untried sorts until they have been tried and proven. Many alluring descriptions indicate a gift for words rather than discriminating iris judgment. Buy unhesitatingly those things recommended by the established specialist and which come from hybridists of reputation and you will have fewer disappointments.

From American hybridists have come many fine varieties such as Blue Velvet, Quaker Lady, Queen Caterina, Shekinah, Morning Splendour, Honey Drop, Dolly Madison, Tuscany Gold, Dauntless, Persia, Desert Gold, Mary Elizabeth Klamath, Oregon Beauty, Midgard, Pink, Satin, Wambliska, San Francisco, Purissima, and perhaps a hundred others of equal or superior merit. Surely a record to excite pride.

Recent Bulletins contain scientific articles and notes on Mr. James Boyd and Mr. Sam Burchfield, who passed away during this year. Mr. Boyd was President of the Pennsylvania Horticultural

Society and a moving factor in the founding of the Iris Society, being continuously a member of its Board of Directors. Of Mr. Burchfield, a friend said, "He was a dear and loved friend who found untellable content in his garden." The last three Bulletins have been divided between scientific items and chatty notes by travelers—iris travelers, a most interesting and fascinating folk. To my garden comes the dignified President of the Society, Mr. Wister; Miss Sturtevant enroute from California to Boston; Mr. and Mrs. Pattison on a flying one-day trip from Freeport, Illinois, to Nashville and return; the vivacious Mrs. Hires, who dares to call Mr. Wister "The Honorable"; Mr. Bonnewitz, who charges about like a robin, hunting new color; Mr. Earle from Birmingham; Dr. and Mrs. Scott from Lexington; Mrs. Kellogg, a wanderer from Connecticut; Mrs. Peckham, still wet from the swamps about New Orleans, where she has been with Dr. Small collecting native beardless iris about which you are going to hear a great deal in the future; young Jesse Nichol, hitch-hiking from Louisiana swamps back to his college degree at Cornell. Dr. Kirkland and I may be seen exchanging notes over the back fence or jibbing at each other as to which of us will win the next Dykes award.

The Society now has approximately 1,500 members and the iris race is not run, it is just begun. I have touched only on the highlights of the Society's life and work. For a Society ten years of age, the sum total of its accomplishment is monumental. For this success we are largely indebted to Mr. John C. Wister, our President. May the Society have long and larger life and may more people travel, more friendships form and better gardens and better Iris result.

News Bulletin

On May 24th, 1932, at the Ninetieth Commencement of Howard College in Birmingham, Alabama, that institution conferred the degree of Doctor of Laws on Dr. A. Richard Bliss, Jr., Chief of the Division of Pharmacology, College of Medicine, University of Tennessee (Memphis). Dr. Bliss is an alumnus ('12) of Howard College.