

Chapter 4

Post-War Growth, 1945-1962

The end of World War II in 1945 introduced the famed "Baby Boom," and a less-noted economic boom based in a catch-up economy and the Korean war. Concurrently, incipient social changes introduced during the war gathered momentum, gradually liberalizing attitudes and laws. Alongside this, however, there was a backwash of conservatism, best shown in the Eisenhower years, based partly in nostalgia for the values and way of life that had been lost in the dislocations of war.

Science (not scientists) still stood somewhat apart from the social and economic turmoil, although less so than formerly. Atomic fission had given physical science a prominent role in military affairs and opened a new source of energy for exploitation. Jet and rocket propulsion of aircraft and missiles became functional. Most important for science, there was public realization that fundamental research could be profitable and should be supported. This appreciation provided political support for the expanded mission of the Atomic Energy Commission in biology and for the creation in 1950 of the National Science Foundation, two organizations that contributed much to the funding of plant science research. The funding was based on peer review by scientists at the forefront of their fields, which favored those investigators who made use of the rapidly developing technologies and concepts of biochemistry and biophysics, and gradually increased the sophistication of plant research. A new and larger cadre of plant physiology students appeared in the form of returned veterans studying under the G.I. Bill. And among universities, federal agencies, and industry there was increased employment for young Ph.D.s with modern training. The introduction of selective herbicides and a growing concern for understanding the basics of crop growth led to increased employment of plant physiologists in agriculture. In 1957 the Soviets sent up Sputnik, formally opening the space age, and the resulting concern over the implied lag in American space science gave a boost to science education in general, including plant sciences.

In all, it was a time of vigorous growth for plant physiology and for its American society, in which membership tripled. Indeed, the growth was worldwide and led to the formation of other plant physiology societies—Scandinavian (1948), Soviet (1954), French (1955), Argentinian and Canadian (1958), Japanese (1959), and the British equivalent, the Society for Experimental Botany (1950).

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Officers

Table 11 lists the elected officers and the appointed executive secretary-treasurers for the 1945-1963 period.

Dissatisfaction with the the fiscal year (July 1 to June 30) as the period of office increased when, in 1950, the Society began meeting with the American Institute of Biological Sciences (AIBS) in early September. A new set of officers who had no part in planning the meeting were in charge. In 1953, secretary A. S. Crafts polled the executive committee on changing the time of election or date of assuming office (1):

When our election time was established in June with officers taking office on July 1st, our National Meetings were held during the Christmas holidays. Hence the Secretary, who acts as Program Chairman, could arrange the program following his election. With the National Meetings coming in September, it is impossible for the incoming Secretary to function as Program Chairman during that year, and there is little time for him to become familiar with the business of the Society by the time of the meetings [and this] situation also applies to the other officers of the Society...

Appointive officers take over their duties on January 1st. That might be the best date for elected officers to take office also. On the other hand, elections in the fall with officers taking office after the September meetings presents an alternative possibility.

A clear majority favored the January 1 date of assuming office, but there were other opinions. Shull, who, as the insistent author of the July 1 starting date, had been asked his opinion, replied with four closely spaced, marginless pages expressing his disappointment with new developments in the Society, including association with AIBS ("a parasite unwilling to earn its own right to exist by having dues and members"[2]). With respect to Crafts's question, he answered:

By electing the president in the spring, and beginning our official year in July, as the gov't. does, the President had six months before the meetings to get used to his job. Because of the slowness of people in paying dues, it was not possible to have a new secretary, or treasurer, or any other officer come in when the journal year was starting. Everything had to be going well by Jan. 1, or the Journal affairs were in trouble. So the collection of dues had to start in the Fall, 3 months ahead of the Journal year. The constitution originally provided that meetings were to be held with the AAAS in December...And speaking frankly, I do not believe that the changes in times of meetings have benefitted anybody.

In short, Shull saw the need for sufficient time to prepare for a December meeting, but not for one in September. In effect, his recommendation was not to change the constitution but to dump AIBS and go back to the Christmas meetings.

An alternative suggestion was made by A. H. Brown, who wrote (3), "it

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Table 11
Officers of the American Society of Plant Physiologists, 1945-1962

Year	President	Vice-President	Secretary	Exec. Sec'y-Treas.
1944-45	H. A. Spoehr	F. W. Went	E. S. Johnston	J. F. Stanfield
1945-46	P. J. Kramer	E. S. Johnston	R. B. Withrow	J. F. Stanfield
1946-47	B. M. Duggar	S. F. Trelease	R. B. Withrow	J. F. Stanfield
1947-48	F. W. Went	R. B. Withrow	C. H. Wadleigh	J. F. Stanfield
1948-49	D. B. Anderson	J. Bonner	C. H. Wadleigh	J. F. Stanfield
1949-50	J. Bonner	C. H. Wadleigh	T. C. Broyer	J. F. Stanfield
1950-51	K. V. Thimann	D. I. Arnon	T. C. Broyer	J. F. Stanfield
1951-52	C. H. Wadleigh	T. C. Broyer	A. S. Crafts	J. F. Stanfield
1952-53	D. I. Arnon	F. K. Skoog	A. S. Crafts	J. F. Stanfield
1953-54 ^a	T. C. Broyer	A. S. Crafts	A. W. Naylor	J. F. Stanfield
1954-55	A. S. Crafts	H. A. Borthwick	A. W. Naylor	J. F. Stanfield
1955-56	H. A. Borthwick	A. W. Naylor	A. W. Galston	J. F. Stanfield
1956-57	F. K. Skoog	S. B. Hendricks	A. W. Galston	G. R. Noggle
1957-58	D. R. Goddard	A. W. Galston	W. D. Bonner, Jr.	G. R. Noggle
1958-59	S. B. Hendricks	A. C. Leopold	W. D. Bonner, Jr.	G. R. Noggle
1959-60	R. H. Burris	W. D. Bonner, Jr.	C. O. Miller	G. R. Noggle
1960-61	A. W. Naylor	H. Beevers	C. O. Miller	W. H. Klein
1961-62	H. Beevers	C. O. Miller	S. Aronoff	W. H. Klein
1962-63 ^b	A. W. Galston	A. Lang	S. Aronoff	W. H. Klein

^a Change to calendar year for term of office (*i.e.*, elected in spring 1954, took office January 1, 1955, rather than July 1, 1954).

^b Change to October 1 as starting date for term of office.

would be preferable if elected officers assumed their duties immediately after the annual meeting...If the time were specified in this way, it would not matter whether we met in September or at Christmas time."

The majority prevailed, and at the 1953 meetings in Madison, WI (4), the executive committee set the term of office of the president, vice-president, and secretary to begin on January 1 following the usual spring election, six months later than formerly. The fiscal year, however, remained unchanged.

Unfortunately, a "lame duck" problem arose from the delayed assumption of office. The duties of the existing officers largely terminated with the annual meeting; the responsibility of planning and arranging the next meeting lay with the new officers, who had, however, no authority to act (*e.g.*, appoint committees) until the new year, which proved to be rather late for effective administration. At the 1962 executive committee meeting (5) in Corvallis, OR, it was decided offices should be assumed on October 1 following the annual meeting. This date served well and has remained the starting date for officers and standing committees.

There were early and continuing concerns over the nomination process for officers. In October 1945, secretary R. B. Withrow included the following

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comments in a letter to the executive committee (6):

The present system of nominating persons for office is not entirely satisfactory. The election committees of the past two years have commented very adversely on the situation. Of the 20 names appearing on the 1945 ballots only 3 received 10 or more nominating votes, the remainder being placed on the ballot by from 3 to 9 nominating votes. Two names were placed on the ballot by lot. Possibly a nominating committee could prepare a better slate. Perhaps a combination of the two methods is possible in which a nominating committee supplies part of the ticket and such names are added as receive a minimum of 10 nominating ballots from the membership at large.

Withrow's suggestion for a nominating committee was fruitless (Shull had distrusted the objectivity of such committees). However, a modification was made in the case of tie votes. The constitution (as amended in October 1944) required that the secretary send out a call for nominations in February and that the ballot carry for each office the names of the four individuals receiving the highest number of nominations (7). In case of a tie for fourth place, "the secretary shall determine by lot which name shall be placed on the ballot." Withrow reported (8) in 1946, "frequently several members receive the same number of nominating votes. As a result, the names to appear on the ballot have been selected by lot [and] it has been suggested that a more satisfactory system of making a final selection be set up."

Withrow's concern got some action. The 1947 constitution (9) was amended to read, "In case of a tie for fourth place, the names of these persons shall be resubmitted to the Society." Had it been followed, this requirement would have given even more trouble, delaying the completion of the nominating-balloting process, but there were no tie nominations broken by ballot. Only after 1962 was the article supplanted by a general directive which persists to this day: "The secretary shall resolve tie votes in either nomination or election results by random selection procedure."

The requirement for four names on the ballot may have been ignored at times. Galston to Naylor (10), April 1956: "For president, you and Skoog received close to 100 nominations each and nobody else received much more than 10. I am planning on offering only two names for this office therefore." (I have been unable to locate a copy of the ballot.)

The office of executive secretary-treasurer was established at the beginning of the period 1945-1962. Appointment was for a renewable three-year term, which in practice became indefinite tenure ("our finances are handled by the Executive Secretary-Treasurer who is a permanent officer" [6]). The office carried membership on the executive committee (7) and was pivotal in business affairs. For Stanfield, the job took on unexpected support duties, as shown in this 1948 letter to Loehwing (11).

I shall send in the galleys I have with the obituary for the January issue

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and as soon as Wadleigh's data arrives from the meeting I shall arrange some short notes. If there is anything you wish to put in or if you care to write any form of report I shall put it through in order to finish the work I began last summer. The notes will follow the page proof and be returned with it since they are simple and they can proof them.

I have some mss. here which I have cleared and shall edit and send in. In order to avoid confusion I shall then arrange the galleys and send them to your office ready for paging... I shall send Thimann's paper for inclusion in this belated January issue and you can thus turn your energies to the April issue and the mss. you have. Please send me at once any materials you may have...

We shall try to have the journal out by Feb. 1. I have not received my October issue as yet! Regrettable and let us hope we can avoid such a delay in the future.

In effect, Stanfield was a copy editor and redactor for Loehwing (who was never in good health after having been badly gassed in World War I), carrying over the work he had done as Shull's editorial assistant: "I worked with the journal for about eight years and handled all detail for Loehwing when he was ill" (12). He edited and revised sloppy manuscripts, handled the proofs, corresponded with authors and printer over problems, indexed the volumes, and handled reprint orders. All this in addition to checking and paying the printer's bill, handling and selling back issues, collecting and recording subscriptions and membership dues, keeping track of the finances, putting out the directory, and generally serving as a resource person to the ever-changing cadre of officers. By 1950, however, Stanfield was relieved of editing chores—Loehwing (by then a dean) transferred details to a young colleague, R. M. Muir, and a secretary. In 1956, when he was closing his service, Stanfield wrote at President Borthwick's request a 10-page account of the duties of the office (13). The account is too detailed for recitation here, but in it he describes a demanding work load, as already noted, with exacting responsibilities.

When David R. Goddard became editor (1953) of *Plant Physiology*, he obtained an increased budget for assistance with the editorial work. It wasn't much—"Dave has had \$750 as against \$300 in the past plus the usual routine expense" (12)—but to Stanfield it was unjustified and a threat to the general endowment that had been so carefully and frugally accumulated. "The reserve we have in our general fund was built through the years with sweat and sacrifice and not by setting up elaborate editorial offices on a professional basis" (12). After he resigned in the fall of 1956, and just after the death of Mrs. Stanfield, his loyal unpaid assistant, he wrote a rather bitter letter to secretary A. W. Galston (14).

I have known for some years that no one would do what we are doing here because they either did not have time or they considered themselves too important. Mrs. Stanfield did the work and we were gradually over-come by the growing organization and should have resigned on the spot in East Lansing [1955 meeting] when the Executive Committee made such a grandiose gesture in favor of an inefficient editorial office [Goddard's] and showed very clearly what

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they thought...about this [Stanfield's] office. I kept the office upon the insistence of Mrs. Stanfield and only regret that she put in those very long hours this past year. We only got the office moved out...the very morning we went to the hospital. We have always had very high regard for the founders of our group and I knew them personally: it was this factor which caused us to sacrifice professional and recreational time to carry on...Change is inevitable and we had anticipated it; I was trying to prepare the Society for it. You may now proceed and spend the money accumulated by 30 years of service on the part of individuals who gave their time to the Society.

Galston sent a copy of this letter to president-elect Folke Skoog, who replied (15), "Apparently Dr. Stanfield has thought of the Society as a more or less private philanthropic enterprise, and I believe that in spite of his current bitterness he has derived a good deal of personal satisfaction from his association with it." This observation was perceptive. Some of the early protagonists, stung by the opposition, had developed an almost sacrificial commitment to the Society, or to Shull. (Stanfield's commitment—or more likely Mrs. Stanfield's—included salvaging and filing old ASPP records and correspondence of great value in writing this history.) But the new membership saw an established and unthreatened Society in no need of devoted service; the Society, rather, needed to serve them.

G. R. Noggle, Stanfield's successor, was working at the Kettering Laboratory, Yellow Springs, OH, and teaching part time at Miami University when he assumed office (personal reminiscence). He knew Stanfield, helped him during his distress over his wife's illness, took over the duties of executive secretary-treasurer when Stanfield resigned, and was appointed to the position for a three-year term (16) in August 1956. The following year Noggle moved to the University of Florida as head of the Botany Department, where he found, after a couple of years, that he did not have adequate time for the ASPP job. He identified a potential successor in William H. Klein of the Smithsonian Radiation Laboratory. Klein had known Stanfield and his work at Miami University (personal reminiscence) and, with Smithsonian approval, Klein was appointed executive secretary-treasurer in 1960. Mrs. Klein, like Mrs. Stanfield, undertook the business operations, initially in their home, and eventually received some pay and recognition for her efforts. But more about this later.

In 1956, K. V. Thimann suggested that Allan H. Brown, the newly selected editor, should receive an honorarium. President H. A. Borthwick agreed (17), but added, "the editor is not the only officer who contributes many hours of time to his job (I am thinking particularly of our permanent Secretary-Treasurer)." The executive committee concurred and voted honorariums of \$1000 per year to the editor of *Plant Physiology* and \$500 per year to the executive secretary-treasurer (16). For many years the secretary had been given \$100 for travel to the annual meeting.

In 1947, the Society was asked to join the proposed American Institute of Biological Sciences (AIBS), and it did so in 1948 as a charter member (18). Starting

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in 1950, the Society held its annual meetings in early September with AIBS.

In general terms, AIBS was and continues to be a consortium of biological societies formed to present a unified front in dealing with common problems. Often these societies were small, with limited resources and influence. P. J. Kramer, who was active in forming AIBS, explained the specific services to be provided by AIBS: to represent the member societies before congressional committees and government agencies, to provide a public relations service to "inform the public concerning the contributions made by biologists to the public welfare," to develop services to handle "routine secretarial work of member societies," to "assist in integrating and increasing the efficiency of publication programs," to maintain a placement service, to promote liaison between biology and other fields, and to better define professional standards. In addition, a most important but intangible service was to be the "psychological stimulus of belonging to a large and influential organization, comparable to the organizations maintained by the chemists and physicists." AIBS would have a professional staff, partially supported by the National Research Council at first, with adherent societies to pay dues of \$1 per year for each of their members (which ASPP did).

The officers of AIBS did plan and offer non-editorial and business services (20), but as Thimann wrote Naylor (21), "In regard to the AIBS proposal of a central business office, my view is that it is only of value if it saves the necessity of our having a Business Manager." The Society chose to maintain its own business and editorial services, as did almost all other adherent societies. This may have weakened AIBS, for it never developed the coherence needed for strength. The Society seemed to value AIBS chiefly for arranging meetings.

Growth and Money Matters

Table 12 (p. 128) gives the available data on growth in ASPP membership, subscriptions, journal publication, and total resources.

Members and subscribers increased steadily, trebling in 18 years. Given the rather mediocre gains from earlier recruiting programs, this increase seems remarkable, because no extraordinary efforts were made to recruit members or woo library subscriptions. The explanation is simple—times were better. There was an increase in the number of employed plant physiologists, and they could afford the dues. They wanted the journal in their libraries, and got it.

However, not everyone thought the gains in membership were adequate. Potential members existed who were not being recruited. In 1955, when the membership had almost doubled in 10 postwar years, Thimann, then an executive committee member, wrote president A. S. Crafts as follows (22):

On financial matters I am, of course, not very well informed, but I am impressed with the relatively small membership which we have. According to the AIBS bulletin, the Ichthyologists and Herpetologists have more members

Table 12
Growth of the American Society of Plant Physiologists, 1945-1962

Year	Annual Meeting ^a	Members	Subscriptions ^b	Journal Pages ^c	Resources ^d
1945 ^e	St. Louis, MO	624	499	708	\$18,032
1946	Boston, MA	664	620	604	\$24,605
1947	Chicago, IL	702	650	650	\$26,816
1948	Cincinnati, OH	752	716	651	\$28,445
1949	New York, NY	810	825	796	(—)
1950	Columbus, OH	885	839	791	\$31,779
1951	Minneapolis, MN	941	885	872	\$35,122
1952	Ithaca, NY	1007	992	860	\$38,454
1953 ^e	Madison, WI	1047	1050	778	\$43,178
1954	Gainesville, FL	1117	1147	554 ^f	\$51,604
1955	E. Lansing, MI	1153	1232	576	\$59,737
1956	Storrs, CT	1244	1288	499	\$63,843
1957	Stanford, CA	1354	1519	692	\$77,080
1958 ^e	Bloomington, IN	1447	1395	462	\$81,227
1959 ^e	State College, PA	1510	1412	692	\$89,439
1960	Stillwater, OK	1635	1499	1020	\$87,218
1961	Lafayette, IN	1723	1642	880	\$89,029
1962	Corvallis, OR	1800	1624	865	\$84,352
1963 ^e	Amherst, MA	1923	1712	779	\$90,385

^a Figures in parentheses are number of contributed papers at meeting.

^b Figures in parentheses are number of foreign subscriptions.

^c Figures in parentheses are number of journal papers.

^d Resources are cash, savings, and investments at the close of the fiscal year, June 30.

^e Change of editor-in-chief of *Plant Physiology*: W. F. Loeihwing, 1945 to mid-1953; D. R. Goddard, mid-1953 through 1957; A. H. Brown, 1958 through 1962; M. Gibbs, 1963-present.

^f Two column format for *Plant Physiology*, 6 issues per year.

^g Executive committee and business meetings were held in Montreal, Quebec, Canada, during the 9th International Botanical Congress.

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than we have, while the Limnologists and Poultry Scientists have nearly as many. It seems likely that a great many people are working more or less in Plant Physiology without belonging to the Society. Somehow or other, I believe we should try to get some of these people in, but this is beside the point immediately under discussion and merely a corollary of a decision involving expenditure.

Thimann seems to have taken his concern to the 1955 meeting in East Lansing, for it was discussed and the suggestion made (23) "that more continuing members might be obtained by attracting larger numbers of graduate students...one or two years before they graduate. A means to do this would be to reduce their dues." This led to student membership at reduced dues (23), a practice which continues today.

The belief that there were people working in plant physiology who might be recruited probably stems from the 1950 report of the *ad hoc* committee for professional status and training chaired by James Bonner (24) (Thimann was a member). A survey made of academic, governmental, and industrial centers of plant research showed 686 individuals, including graduate students, working specifically in plant physiology, and 2527 in fields closely allied to plant physiology, of which 31.9 percent and 8.4 percent, respectively, were members of ASPP. The latter group consisted of applied physiologists, predominantly agriculturists working with specific crops or diseases. The survey covered 57 percent of the membership of the Society. By extrapolation there were an estimated 500 active professional (non-student) plant physiologists in the United States and 2000 professional applied plant physiologists. Concern was expressed that the number of graduate students being trained in plant physiology far exceeded the number needed to fill the positions vacated annually. (In fact, it was to be almost two decades before jobs became scarce—the job market for scientists expanded with the economy.)

The number of journal pages published had been a prime indicator of both growth and expense. However, the change by Goddard in 1954 to a double-column format considerably reduced total page numbers—778 pages for 82 papers in 1953, compared to 554 pages for 114 papers in 1954. This format was late in coming, given the early and continued pressure for it. In 1946 the executive committee had asked the editorial board "to investigate the advisability of changing the journal format to include a larger page having two columns" (25) in order to reduce costs but little was done. Loehwing wrote Shull (26) that beginning in January 1949 printing charges would increase 12 percent, and that he was investigating some radical new developments in printing to see if economies could be made. He also summarized the AIBS proposal to take over non-editorial printing affairs for member societies:

The AIBS has undertaken the study of printing problems with the intention of serving as a centralized printing agency for quite a number of scientific journals. This project, however, is still in the investigative stage. I feel

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it includes payment for all services by each journal. In view of the fact that we now have considerable service rendered gratis by editors and editorial boards, I shall be interested to see how this particular problem can be met, if at all, by the AIBS proposals.

Loehwing also wrote Stanfield on the same subject (27):

I would welcome your comment on these [AIBS] proposals and any suggestions you might have as to a way to proceed from this point...

It seems to me that we probably now confront the absolute necessity of raising more funds for the Journal, perhaps over and above the small gains recommended by the Executive Committee at Cincinnati [dues from \$5 to \$6, subscriptions from \$8 to \$10]. I would reluctantly recommend an increase in dues but this may be necessary... The only other alternatives would be to reduce the size of the volume or go to a cheaper method of printing. I understood that the Executive Committee was unanimously opposed to a reduction in the size of PLANT PHYSIOLOGY... I might say that thus far we have never refused a paper because of financial stringency. If we are to reduce the size of the volume, I think we would merely be obliged to omit some papers of questionable value which we now publish.

Stanfield disposed of AIBS with (28), "They can save nothing since you and I work for nothing," and added, "I believe the only answer is to cut publication. If the Executive Committee does not favor this, then let them tell us how to raise the money..." The AIBS proposal was not accepted, and at the 1949 executive committee meeting, dues were raised rather than restrict publication.

In July 1950, Loehwing wrote a two-page analysis of printing options and costs for the executive committee and the editorial board (29), concluding that "it would be possible to get issues out more rapidly by offset or letter press printing," which with lighter paper "would effect probably at least a 20 per cent saving in printing costs and probably more." However, he added that compared to handset printing there might be some loss of quality. He asked specific questions: should offset or letterpress be adopted; should a double-column format be used (more an issue of style than economy, he cautioned); should issues be quarterly, bimonthly, or monthly?

Loehwing could not attend the annual meeting in Columbus, but Stanfield reported (30) to him that "it was voted to have you do as you wished." The executive committee preferred the two-column format, but were not enthusiastic about the offset printing. However, after getting details from T. C. Broyer, Loehwing wrote Stanfield (31), "I am now disposed to recommend that we merely switch from Business Press to Science Press [nonunion letterpress] and retain the present format of the Journal." Which is all he did, realizing a nine percent saving (32).

Table 13 presents available data on publishing costs from fiscal year reports (*i.e.*, for printing, mailing, and editorial expense the last half of one year and the first half of the succeeding year):

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Publishing costs rose steadily, increasing about sixfold over this 18-year period. (Surges in expenditure over the previous year, as in 1957-58 and 1959-60, resulted from delayed payment of a printing bill from the previous fiscal year [34]. The disparity between the drop in net worth [Table 12] and the deficit [Table 13] in a year such as 1959-60 is accounted for by changes in value of securities [34].) Contributing to the increased costs were two- to threefold increases in papers published, a natural outcome of increased membership. However, a threefold increase in members and subscribers did not cover the publication bill; dues (which included the journal) and subscriptions had to double for the Society to remain solvent, and they did—in this period dues went from \$5 to \$10, subscriptions from \$8 to \$16.

As is customary, library subscriptions carried the burden of the costs. In 1960 and 1962, deficit years, libraries provided 62 percent of the total income for 47 percent of the journals distributed. Although the minutes do not record it, the

Table 13
Receipts, Disbursements, and Publication Expenses of ASPP, 1945-1963

Fiscal Year	Receipts \$	Disbursements \$	Publishing ^a Expenses \$
1945-46	12,882	6,709	5,638 (84.0)
1946-47	12,437	8,757	6,604 (75.4)
1947-48	—	—	—
1948-49	16,183	14,618	10,985 (75.1)
1949-50 ^b	17,541	14,719	12,919 (87.8)
1950-51	19,643	17,183	13,983 (81.4)
1951-52	20,287	17,081	14,511 (85.0)
1952-53	21,612	16,799	13,082 (77.8)
1953-54 ^c	23,503	14,988	11,039 (73.1)
1954-55 ^d	28,635	20,487	15,309 (74.7)
1955-56	34,313	24,890	18,956 (76.2)
1956-57	36,462	22,525	18,554 (82.4)
1957-58	33,321	31,818	25,625 (80.5)
1958-59	33,919	26,308	18,590 (70.7)
1959-60	37,170	40,347	32,345 (80.2)
1960-61 ^e	41,592	39,895	32,159 (80.6)
1961-62	38,860	41,652	34,546 (82.9)
1962-63 ^f	49,715	46,870	32,674 (69.7)

^a Figures in parentheses are publishing as percent of disbursements.

^b Dues \$6 domestic, \$6.25 Canadian, \$6.50 foreign; \$10 subscribers.

^c Subscriptions \$12 (but voted to be \$14, Vol. 28:761, 1953).

^d All dues \$8, except students at \$5, and life membership at \$150

^e Gift of \$2500 from the Walter Thomas estate (33) prevented a deficit. The Rockefeller Foundation gave \$200/year, 1946-1955 inclusive.

^f Dues \$10, subscriptions \$16.

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discussions of the executive committee on how to meet printing costs must have focused quickly on subscription rates, for in one instance these rates were increased ahead of dues. In ASPP, as in many societies, the journal going to the library for general use carries some of the cost of the journal going to the member for private use. The differential in cost is often justified on the basis of the number of readers served, or on compensatory non-monetary contributions made by members, but it derives from the vulnerability of the libraries, which must provide the journal for common use.

Not all libraries felt compelled to take the journal, and foreign subscriptions were ever uncertain (see 1956-58, Table 12). Klein's 1962 report to the executive committee showed a decline in international subscriptions and included this remark (35):

In 1961 there were no subscriptions to Hungary, but we recently received orders for 19 copies to various cities...A different situation has developed in reference to subscriptions in the U.S.S.R. Last year there was a total of 75 paid subscriptions—this year the number has fallen to 9. This marked reduction seems to confirm a recent news dispatch from London stating that the Soviets have adopted the practice of duplicating foreign journals for distribution to their scientific institutions, and in some cases have even censored items.

Inspection of Table 12 shows that, despite the concerns generated by the rise in publication costs, up to 1959 the Society increased fivefold in resources. Thereafter, however, net worth shows an oscillation which can be largely accounted for in rising expenditures for publishing and for operational expense (the difference between disbursements and publishing, Table 13). A change in attitude toward finances was responsible for this leveling off in resources. The new attitude began to surface in 1953 when Goddard became editor, and was characterized by the question, "Why is this Society so dedicated to making and saving money?" A comment of Thimann in a 1956 letter to Galston, then secretary, is typical (36):

I feel the Society owes an obligation to its members to give them the best possible service for their dues. Apart from running the annual meeting, the most important service is the Journal. Therefore the Society should make available to the Journal whatever funds are needed (by reasonable standards)...it is open to serious question whether the Society should use members' dues to build up endowment if the Journal can use the money. The Society is not a holding company but an operating agency.

"Use the money" was, of course, incomprehensible to those who had nurtured the Society through hard fights and hard times with little assistance and no honorariums, and who saw security in the bank account. Stanfield's bitter reaction (12, 14) was to be expected, as was the gradual loss of his generation's influence. By 1960 the Society's survival was taken for granted. An adequate level of assistance to the editorial and business offices was expected. Enough money to

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break even was money enough (well, err on the side of a small positive balance!); if needed, raise the dues, or better yet the subscriptions.

One unwritten but seldom questioned principle was left from earlier times—the Society should maintain a reserve adequate for one year's operation. In terms of total resources it did so (see Tables 12 and 13), keeping pace with inflation. However, not all the resources were available for operations, and some of the progressive members were unaware of this. The constitution continued to require that awards and life memberships be supported by the income from endowments, with the principal left intact. In July 1962, for example, of \$84,352 total resources, \$50,539 were invested endowment funds (35). In addition, security and fluidity of operations required a reserve of cash or readily liquidated investments. An example of this appears in Klein's report to the 1963 executive committee meeting (37):

Operating income totalled \$49,714.92 whereas expenses were \$46,869.50 for a net gain of \$2,845.42, in contrast to last year's deficit. However, another positive balance is not likely next year since increases in both operating costs and size of the Journal are forecast. Discussion of the report centered on Dr. S. A. Gordon's suggestion of last year that the Society should spend some of its surplus funds. Dr. Klein presented a detailed analysis of the Society's resources, pointing out that most of these are in endowment funds whose principal cannot be spent. However, there has accumulated over a period of several years net income from the Life Memberships and General Endowment Fund of some \$12,753.23 which has not been allocated to specific purposes. He noted that the Stephen Hales endowment does not produce sufficient income for the award, and the resulting deficiency in prize money must now be made up from general income. Also, due to the seasonal nature of the Society's income, a cash reserve must be maintained to meet major expenditures which often arise before dues and subscriptions have been received for the current fiscal year. At present, only about one-third of a year's income is maintained in an interest-bearing account as a cash reserve, and Dr. Klein recommended that this reserve be increased to about half a year's operating expenses. After a detailed discussion, the motion was passed that \$6,000 of the accumulated net income balance of General Endowment be transferred to the Stephen Hales award endowment, thus making the award fund self-sufficient, and that \$6,000 be transferred to the interest-bearing cash reserve account raising this to approximately 50% of annual operating requirements that Dr. Klein deemed adequate. Dr. Gordon withdrew his proposal and concurred in these suggestions.

Shull had originally planned to build the general endowment to the point where the income from it would carry the general expenses of the Society, and he diverted all the money he could into this fund. If he had been still in control, the \$12,753.23 accrued income from the general endowment would have been reinvested on the "endowed endowment" principle. As early as 1947, however, this policy was in abeyance. A letter from P. J. Kramer to F. W. Went (38) on the finance committee expresses the more prevalent attitude.

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At one time Shull hoped to see our endowment increased to the point where it would yield enough income to carry the overhead of the Society. Then all income from dues and subscriptions could be applied to the publication of Plant Physiology. In view of the low return from investments endowment seems less important today than a steady income from members and subscribers. Possibly most of our effort should go to increasing this. In addition we need to keep a fairly large cash reserve to meet any deficits which might result from sudden loss of membership resulting from a war or depression.

With the steady increase in membership and subscriptions, the goal of sufficient endowment income to operate the Society was essentially forgotten. And with reason—current income from dues and subscriptions was (or could be made) adequate to support all Society activities, not just the journal. As shown by Klein's report (37), the Society had to be prodded into augmenting the award endowments to a level where they produced enough money for the awards, as required by the constitution. The need for a cash reserve had to be explained to keep the Society's activists from spending it.

In 1945, Section 2c of the bylaws directed that investments of the Society be made by the executive secretary-treasurer with the advice of the finance committee, which consisted of three members, one appointed each year for a period of three years. The members in 1945 were H. H. Spoehr, W. Thomas, and Shull (who, though retired, was perennial chairman, and whose advice Stanfield seems not to have questioned). The bylaws also charged the committee with seeking "ways and means of increasing the productive funds for permanent support of the Society's work," which in practice was to make certain that any unattached money (e.g., sales of back issues and volumes) went into the endowments.

As noted in Chapter 3, Shull had long envisaged the creation of a board of trustees to assume full responsibility and accountability for financial affairs. Finally, at the 1951 meeting in Minneapolis (32), the executive committee endorsed amendments to replace the finance committee with a three-member board of trustees, and the membership voted approval on the 1952 ballot. The change, however, was only in committee name. The duties and the words describing them were exactly the same (39): "act in an advisory capacity to the executive secretary-treasurer with reference to the investment of the productive funds of the Society," along with the directive to increase those productive funds.

Some members and officers had thought the change to a board of trustees had been made to delegate fiscal responsibility and authority to a committee. It was even believed that reorganization with fiscally responsible trustees was a sufficiently drastic change to require reincorporation of the Society, but this proved unnecessary (40). In reporting the minutes of the 1952 meeting (41), secretary Crafts wrote, "The new Board of Trustees has been set up...These men pass on all business transactions and they determine finance policy."

In appointing W. Thomas, S. B. Hendricks, and F. P. Cullinan (chairman) to

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the board of trustees, president D. Arnon had assumed that the board was given these broader responsibilities, but Cullinan and Stanfield quickly told him otherwise. And Stanfield wrote Crafts (42), "There is really nothing to discuss as far as this Board is concerned—they handle the investments and that is it...To change our form of government and have this Board nosing into routine will tangle things hopelessly and no one can operate this office with the status implied." The business routine that Stanfield saw jeopardized included allocation of funds, for in a similar letter to Arnon he wrote (43), "As a matter of fact, the Board has no right to allocate anything; this is the business of the Executive Committee as we now operate. All can advise—the Committee acts."

Arnon persisted in believing that an executive committee discussion on the duties of the trustees was in order, as shown in this letter to Stanfield (44):

As for the discussion of the functions of the Board of Trustees, this suggestion emanated from previous correspondence with Dr. Cullinan. He pointed out that the statement by Dr. Crafts in his letter to the Executive Committee dated October 24, 1952 that the new board "passes on all business transactions and determines financial policy" is not covered by existing legislation. This, I believe, is also the conclusion of your letter. It seems desirable, therefore, as Dr. Cullinan suggested, to have a discussion of this to clarify the apparent confusion.

Incidentally, I just had a letter from Dr. Cullinan in which he offers to meet with the Executive Committee at Madison to report on the activity of the Board of Trustees...No one, to my knowledge, has proposed to change the purpose of the Board of Trustees, but again confusion seems to exist as to what it was originally designed to be. I am sure that discussion at Madison will prevent future misunderstandings.

No mention of the role of the board of trustees appears in the minutes of the 1953 executive committee or those of the membership meeting at Madison. Apparently, no one had a job for the trustees other than advising on investments; thus, there was nothing to discuss.

It did become customary for the chairman of the board of trustees to meet annually with the executive committee, but in this period not as a voting member. The activities of the trustees as of 1962 are best described in a excerpt from a letter written by Klein (45), executive secretary-treasurer, in response to an inquiry about ASPP investments:

From time to time the Trustees, who constitute the Finance Committee, examine the securities holdings portfolio. Information in regard to earnings and market value is made available to them annually through the report of the Executive Secretary-Treasurer (ex-officio member of the Board of Trustees) and through the annual reports of the corporations in which the Society has invested. At longer intervals, usually in an effort to achieve a desirable "balancing ratio" by appropriate distribution of the security holdings among bonds, preferred stocks and common stocks, a detailed review is sought from

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professional sources...A certain proportion of reserve funds are, of course, maintained in interest bearing savings accounts.

Shull delivered the finance committee's final report to secretary Crafts (46):

We turn over to the new Board of Trustees one of the most vigorous programs of self-growth and progressively sound financial strength to be found in any scientific society in the United States. The present position is the result...of the most careful planning; especially does it result from the operation of certain laws passed by the Society during the decade of the 1930's...[We recommend that] the Society use all of its power and influence to keep these laws working...

In addition we desire to leave one admonition: that the Society resist all attempts to lower the standards of our investment policy. Safety of Principal is far more important than size of income...No speculative use of the funds should ever be tolerated.

Shull never forgot the defaulted bonds of 1930.

Publications

Table 12 gives the number of papers published in *Plant Physiology* each year. Table 14 gives a classification of these papers by editor.

Again, classification is very difficult and inexact—a paper which describes a study of respiratory metabolism as a function of breaking seed dormancy with a chilling treatment could fit in three of the above categories. Classification has been made on the basis of what appears to have been the major interest.

The data show important changes in the number and kind of papers published over the 18-year period. Advances in the science will account for most of this, but the changes of editor-in-chief also may have contributed. That is, the policies and reputation of an editor can affect the number and kind of articles submitted (Goddard's interest in respiration might account for the large number of respiration papers he attracted and published).

Loehwing edited for eight and a half years (from January 1945 to July 1953) maintaining the format and most of the policies of his mentor, Shull. On the average, he published 65 papers per year. Goddard averaged 107 papers per year for four and a half years, and Brown averaged 129 papers annually over his five years. Since the membership trebled during this period, the advance in papers published is not surprising; but it would never have occurred had not the journal expanded to accommodate them (double-column format and six issues per year). Another contributing factor was the increased availability of grant funds. The creation of the National Science Foundation in 1950 and the broadening interest of the Atomic Energy Commission in plant biology opened opportunities for plant physiological research beyond those provided by universities and experiment stations. More research, more papers.

Table 14
Classification of Papers Published in *Plant Physiology*, 1945-1962

Category	Number		
	Loehwing 1945-1953	Goddard 1953-1957	Brown 1958-1962
Mineral nutrition, ion uptake	107	92	73
Biochemistry, metabolism	92	101	150
Hormones, growth substances, herbicides	72	66	104
Response to environment, stress	48	29	45
Methods, techniques	47	20	22
Photosynthesis, leaf pigments, stomates	39	37	66
Water relations, vascular transport	32	16	30
Growth, development, tropism, senescence	25	13	21
Seeds: formation, dormancy, germination	20	12	26
Pathology, injury, toxins	16	10	21
Flowering: photoperiod, vernalization	11	20	13
Biophysics	11	3	6
Fruit: growth, ripening, storage	8	2	8
Respiration, mitochondria	7	34	26
Tissue culture	4	5	15
N ₂ fixation	0	2	4
Miscellaneous	14	21	15
Totals	553	483	645

The character of the research changed. By the 1960s there was a pronounced drop in articles devoted to methods; except for novel developments, techniques were more often described in the methods section of research reports. Although still prominent, mineral nutrition and ion uptake studies declined, due primarily to diversion of the practical aspects to agriculture (soil fertility) and of the basic aspects to biochemistry (nitrogen metabolism, bioenergetics, and metalloenzymes).

The categories that grew were biochemistry, hormones and growth regulators (including selective herbicides), photosynthesis, respiration, and tissue culture. Within biochemistry there was a marked shift from papers on chemical composition toward studies on enzymic reactions and carbon and nitrogen metabolism. Photosynthesis and respiration were increasingly studied with isolated chloroplasts and mitochondria. Control of growth, development, and senescence by endogenous (auxins, gibberellins, cytokinins, ethylene) and synthetic (2,4-D, maleic hydrazide, etc.) plant growth substances became a seminal topic, penetrating or overlapping almost every other topic on the list.

After 35 years, the plant physiologists were finally following Shull's admonition (47) to "delve more deeply into the problems of developmental metabolism under the leadership of physiologists well trained in the methods of biophysics and biochemistry." The delay was understandable: Shull did not foresee

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that the physiologists had first to discover the regulatory action of plant hormones, as well as to describe the biochemistry and biophysics of plant anabolism.

An interesting side light on the publication of these papers is that they were not protected by copyright. In November 1951, Stanfield had been approached for permission to reproduce *Plant Physiology* on microfilm, and he referred the question to Loehwing, who replied as follows (48):

I think this raises one of the most fundamental issues which we confront. The Journal is not copyrighted and, frankly, anyone is legally at liberty to reproduce in whole or part; consequently the permission requested by Schwaab's letter is more of a courtesy than a legal requirement on their part. Only if our Journal were copyrighted, can we control reproduction thereof by other agencies.

The above seems to me to hold true now and for the future for the non-copyrighted volumes issued to date. We may now wish to consider copyrighting in view of the considerations involved in Schwaab's inquiry...J. C. Canner & Co. could buy one copy of an issue and reproduce it in unlimited numbers...The net result could easily be a drastic reduction in our subscribers...I am sending copies of this letter to Doctors Wadleigh and Crafts for their consideration with a view to possible discussion by the Executive Committee and Editorial Board...I am disposed at this time to recommend approval of Schwaab's request...J. C. Canner & Co. are a reputable corporation and I do not anticipate that they would proceed over our objections [authorization for micro-carding was given them in 1954].

To date, documents on the outcome of this copyright issue have not been found. Inspection of the journal shows copyright beginning in 1970 with the transfer to Waverly Press as printer. At that time the matter of journal reproduction had become a much broader problem because of the introduction of office photocopying.

Loehwing came into the editorship of *Plant Physiology* with broad experience in Society and journal affairs. He had served as secretary-treasurer, vice-president, president, and secretary of the editorial board (Chapter 3). As secretary of the editorial board he received manuscripts, sent them out for review, had revisions made, and sent final drafts to Shull, who prepared the manuscripts for printing. Thus, he received editorial training under Shull. Unlike Shull, however, Loehwing was not a devoted editor, although he was an intelligent and informed one. As indicated previously in the matter of changing formats, he was not venturesome or innovative (exception—he got approval to publish an occasional paper in a foreign language [25], although he never did). He did not neglect the journal, but he kept it going much as he found it. He was heavily involved in administrative work at the University of Iowa, first as head of the botany department and later as dean of the graduate school (49), and collegiate administration appears to have interested him more than the journal. His health seems to have restricted his level of activity, as well: "He was exposed to gas warfare and bore the scars and

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damage of this experience the rest of his life" (49). (It is hard to recall nowadays that men were left with scarred faces and lungs from chemical attacks.)

As mentioned earlier, Loehwing initially obtained a great deal of assistance from Stanfield, and later from Muir. For this history, Muir has kindly described his experience (50):

I arrived at the Iowa botany department Sept. 1, 1948 to assume Loehwing's duties as plant physiologist [Loehwing was now head]. I taught courses in General Botany, Plant Physiology and Advanced Plant Physiology each semester...The following year I had three graduate students in Ph.D. programs working with me.

Shortly after Loehwing assumed the deanship [1950], he called me into his office and asked me if I would be willing to help him with the editing chores of the journal...I would have the help of his office secretary in the department (who had been doing most of the laborious tasks) and a part-time student help for me. In my naivete I agreed to help him.

I received a letter from the president of ASPP (T. C. Broyer) dated December 4, 1950 informing me that the executive committee at Loehwing's request had appointed me as Secretary of the Editorial Board for a term of five years beginning July 1, 1951. In the interim I "might act in similar capacity, although in an 'unofficial' way."

In December 1950 I got started on the processing of all manuscripts. What a dreadful job it was in addition to all of my other responsibilities! Only on infrequent occasions was there any consultation with Loehwing about editing decisions...

I have no knowledge as to the immediate cause for Loehwing's resignation as Editor-in-Chief. He did have periods of ill health which I ascribed to his having been gassed in World War I. The letter from the president of ASPP (D. I. Arnon) organizing a committee "...to study and report on ways and means of improving the journal of the Society" did mention that he was forced to resign because of poor health. However, I think he wanted to devote all of his time to the affairs of the graduate college. Shortly thereafter he also resigned as head of the botany department.

Loehwing used Muir as Shull had used Loehwing. The distinction, of course, was that Loehwing's appointment as secretary of the editorial board in 1939 (chapter 3) occurred after he was an established professor and had served the Society as secretary-treasurer, vice-president, and president. He could afford to sacrifice research time for the journal, and he received his reward in Shull's support for promotion to editor-in-chief. Assistant professors, in contrast, need research time, will have little to show for editorial chores, and will not have attained the professional stature required for advancement to editor-in-chief. After Goddard became editor, the position of secretary of the editorial board was dropped, and Muir served the balance of his five-year appointment simply as a member of the board. Subsequent editors have employed help for editorial assistance or shared the burden with associate editors. Loehwing probably felt he could not spend ASPP money for

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assistance (certainly Stanfield would have resisted—much of their correspondence is on how to meet rising costs of publishing the journal, storing and insuring extra volumes, and the like).

There is little to suggest that Loehwing enjoyed being editor, at least in the sense of feeling rewarded beyond the recognition the job provided. In 1947, two years after accepting the editorship, he submitted his resignation to the executive committee on the grounds of increased duties at the University of Iowa (51). However, he was talked out of it at the annual meeting. The relevant passages of the minutes read as follows (52):

7. The Committee declined the resignation of Dr. W. F. Loehwing as Editor-in-Chief of the Journal, and prevailed upon him to continue in this office.

8. It was decided to defer the selection of someone to fill a vacancy on the editorial board pending study by the Editor-in-Chief towards making a recommendation to the Executive Committee.

10. It was voted that the Executive Committee appoint a Managing Editor on the advice of the Editor-in-Chief in lieu of the former Secretary of the Editorial Board.

11. The Committee voted that members of the Editorial Board other than the Editor-in-Chief be designated as Associate Editors.

There is no indication that anyone was ever appointed a managing editor. The masthead never indicated that members of the board were associate editors, nor that Muir was designated secretary of the board, although Loehwing used the terms in correspondence. The duties of the board seem to have been largely in reviewing or refereeing manuscripts, the common practice. (As an aside, it should be noted that the executive committee often voted actions, such as appointment of a managing editor, that were not taken. Indeed, these lapses are not unknown even in recent times. It proves easier sometimes to pass a resolution than to get the following administration to remember it and activate it.)

At the 1949 Christmas meeting with AAAS in New York (53), Loehwing accepted another five-year appointment as editor-in-chief, with one concession—the size of the editorial board was to be doubled from eight members to sixteen (ten appointed, six elected; Muir as secretary of the board became one of the appointed). There was also financial relief to be forthcoming in the form of an increase in dues and subscriptions (Table 13). In consequence, the journal had a sustained increase in papers published (from 68 in 1950 to 80 in 1951, Table 12). On May 13, 1952, Loehwing wrote his sixteen associate editors a letter of appreciation (54) that implies that he and Muir were only the negotiating agents between the editorial board and the authors:

The creation of the panel of Associate Editors twice the size of the original editorial board has been an unqualified success. The new plan has given PLANT PHYSIOLOGY the benefit of a wider range of professional talent and

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expert judgment of manuscripts on increasingly diverse subject matter, and has effectively distributed the editorial burden resulting from the great increase in manuscripts received. The new plan has also expedited the processing of manuscripts which, of course, has been greatly appreciated by authors...Only the expert help of our editorial associates makes possible the survival of the editor-in-chief and the secretary of the editorial board as go-betweens among our referees, authors and members. Dr. R. M. Muir and I wish to express our personal thanks for your help and patience with the often difficult editorial work.

Inspection of a surviving file of correspondence on withdrawn or rejected papers of this period reveals that most papers had at least one member of the editorial board as a reviewer, but there is no indication that editorial board members had any other editorial function. Negotiations for revision were frequently over Muir's signature, while most of the rejection letters were written by Loehwing. There are a few plaintive inquiries wanting to know the fate of a paper submitted some months previously.

By this time, however, Loehwing had reached a firm decision to resign. At the September 1952 meetings at Cornell (55), president C. H. Wadleigh "reported that Loehwing wishes to resign from the Editorship-in-Chief because of poor health." This was followed by passage of a motion by Skoog that "the President appoint a special committee of five members to study possible means of improving the publication of Plant Physiology." At a later meeting "Arnon [new president] announced that Thimann would serve as chairman of this committee," which in effect became a search committee to "report one or more candidates for the position of Editor-in-Chief."

On February 24, 1953, Arnon reported to the executive committee (56) that "the Special Committee...consisted of K. V. Thimann, chairman, B. S. Meyer, D. R. Goddard, F. Skoog, and H. B. Vickery (W. F. Loehwing and R. M. Muir declined appointment)." The committee "nominated unanimously (except for D. R. Goddard's dissent) the following candidates in the indicated order of preference: D. R. Goddard, D. B. Anderson, W. E. Loomis, S. B. Hendricks." The executive committee was polled, and Goddard received eight out of twelve votes cast (57).

Loehwing had set July 1 as his date of retirement as editor. Arnon immediately entered into negotiations with Goddard, who knew, from serving on the search committee, a good deal about the position. (As an aside, these are the first letters found in the archives that are marked VIA AIR MAIL.) He assured Goddard (58) that "the financial resources of the Society are dedicated principally to the publication of its journal. Secretarial assistance to the Editor is definitely a part of the expenses incident to publication [and] we are determined not to lose the elected editor because of inadequate secretarial assistance." He was confident that any changes in format or publication of the journal would be approved. And they were, including the additional \$600 for secretarial help which upset Stanfield so.

Goddard also made inquiries of Loehwing, and received this reply (59):

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I shall endeavor to cover the questions as raised in your letter.

1. The secretary to the editor has been working a 44 hour week.
2. The University has carried all costs of secretarial services.
3. We reject 20% of the manuscripts submitted.
4. The financial and business arrangements for the JOURNAL have been in part prescribed by the constitution and bylaws, in part by the executive committee, and in part by the editor. I would assume any or all of the present arrangements could be modified as circumstances would indicate.

5. We receive between 10 and 12 manuscripts a month and found the peak at 16 for March. We currently have 87 manuscripts in process and 22 in galley.

6. The stipend made available by the University for an editorial secretary, of course, does not permit hiring of professional personnel to do the actual editing such as was done for many years for the BOTANICAL GAZETTE at the University of Chicago by Miss MacCloud [MacLeod]. The actual editing must be done by the editor or members of the editorial board.

I think you are very farsighted in being sure that you have adequate time to handle such work as you may not be able to delegate. I frankly feel that it would also be wise if provision could be made before hand to hire someone else of sufficient professional competence to perform those duties for which you yourself might not have time.

In his last sentence Loehwing seems to refer to the kind of work done for him by Muir as secretary to the editorial board. At this time the editor prepared manuscripts for publication (redaction).

Goddard accepted the editorship starting July 1, 1953, on condition that an additional \$600 be allocated for secretarial help (60). He put out the last two issues of Volume 28 in the established format with papers in process. In the last issue, he placed a note of appreciation for the work done by Loehwing as editor-in-chief and Muir as secretary of the editorial board. Starting with Volume 29 the journal was converted to two-column format and six issues a year. Science Press was retained as printer.

There appears to have been widespread and warm approval of Goddard's appointment. Even Stanfield in writing to Crafts (61) was not negative:

Hope Goddard can get the journal out on time—in spite of all of the funds named for Iowa City the journal has always been late. We hope it can work out better; Iowa City must have had other fish to fry—someone must give their time to it. Goddard should have enough help unless he plans to devote no time to it at all and he apparently does not plan this. After all, it is not my responsibility but I do have to work rather closely with the editor and printer.

Goddard was a University of California, Berkeley, graduate, who had obtained his Ph.D. in botany in 1933. He had two years as a National Research Council fellow at the Rockefeller Institute, where he worked with L. Michaelis of enzyme kinetics fame. In 1935, he obtained a position in the botany department at

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the University of Rochester. He first appears as a member of the Society in Bulletin No. 13, 1941, but he published in *Plant Physiology* in 1938 and was probably a member at that time. His studies of plant respiration (published in the *American Journal of Botany*, then the prestigious journal for basic research) gave him a strong research reputation. He received the Hales award in 1948. In 1946 he moved to the University of Pennsylvania as professor of botany, advancing to chairman of the department in 1952, to director of the division of biology in 1957, and to provost in 1961. After retiring he served as home secretary of the National Academy of Sciences. During his editorship he was department chairman and, in his last year, director of the biology division. Like Loehwing, he had the distractions of administration to interfere with his editing.

Goddard was scarcely settled in as editor when he wanted out. Administrative duties may have been responsible. At the Gainesville meeting in September 1954, a little more than a year after becoming editor, Goddard requested relief as of December 30, 1955. President Crafts, in reporting this to the executive committee (62) wrote:

I wrote Dave on April 8, 1955....,"Personally I would like to see you continue on for a period of two or three more years until the new pattern of publication is crystallized and we can make a leisurely but thorough search for a new man."

In his reply of April 13, 1955 Dave says "It had been my intention last summer to give up the editorship of *Plant Physiology* on December 30, 1955, completing Volume 30, hoping that we could appoint a new editor as of July 1, 1955 who would from that date act on manuscripts to be published in 1956. However, if the Society wishes me to continue as editor, I am willing to do so, at least through the year 1956, as I feel I would like to solidify the standards of the journal...However, if I am to continue as editor, I must have more funds for the editorial assistant. This year the Society has allowed me \$900...and the University supplemented that salary to the extent of \$225, so that Dr. Valentine will receive \$1,125 from July 1, 1954 through June 30, 1955. However, the amount of time that she has put in is out of all proportion to the pay that she has received. The only way I can continue as editor is to continue to have the assistance of someone of the competence of Dr. Valentine...I feel we must pay her \$2,000 for the year. This is a part time position calculated at a rate of \$4,000 for full time...it is possible that this would require a budget of \$19,000."

I am asking that each of you write me a reply soon, stating whether you prefer (1) seeking a new editor this year or (2) asking Dave to serve through 1956. If the majority favors (1) I will immediately reactivate Thimann's committee and we will all have to work on the problem of finding a new editor. If the majority wants to retain the present editor through 1956 we should be prepared to grant his request for additional support.

Crafts reported the results of the ballot to secretary A. W. Naylor (63):

I have just written to Dave, giving him the results...We have 14 members;

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Thimann holds two positions and votes once; so there are 13 voting positions. Goddard is a member, and he will not vote; that leaves 12. Of these, 10 are strongly in favor of keeping Dave through 1956, or longer if he will stay. They favor giving him all necessary financial aid. Weintraub and Stanfield did not reply.

Stanfield wrote earlier at considerable length to the effect that his relations with Dave were friendly, he thinks he is doing a good job, but he is afraid Dave just does not have enough free time to devote to the job.

Thimann is willing to head the Committee again to search for our next editor; he cannot consider it himself because of other commitments. He says there are several runners up from the previous search, and possibly some one of them could do the job. We can thrash this out in September.

Stanfield's remark about Goddard not having enough time for the job may have been on the mark. In a letter to the president, H. A. Borthwick, dated January 13, 1956 (64) Stanfield remarked, "I am glad to state that the July issue should be in the mails next week and the November issue is well along the way." (Six months from date of issue is, of course, an unusually long delay.) Earlier, on November 30, 1955, he had written Galston, the secretary-elect (65), "our Journal is farther behind than it was a year ago and I see no hope for a change under the present set-up." To which Galston replied (66), "I, too, have been profoundly disappointed and disturbed by the lack of progress in the Journal. I think it has improved in format and in content, but it is certainly irritating to have it run so far behind schedule. I suppose Dave's absence from the campus of Pennsylvania is a contributing factor."

When Galston became secretary he wrote Goddard on February 3, about several items, and in ending touched on the publication delays (67): "I join many others in hoping that *Plant Physiology* will soon approach its schedule with regard to publication. As you may know there has been some grumbling on this matter." In reply (68), Goddard explained that he left (on leave, presumably) with all manuscripts ready to go to press, but in his absence "Dr. Valentine apparently did not push the matter of printing, so that the September issue did not go back in page proof until the day of my return." The time was long past when an editor (Shull) could advise contributors to delay submitting papers while he went on a quarter's leave.

Goddard was not able to attend the 1955 meeting at Michigan State, and so submitted a report on the journal for fiscal year 1954-55 to Naylor for transmittal to the meeting (69). He made no mention of late issues, but reported that "the cost of six issues is going to be about \$13,300 which is approximately \$1300 more than was spent for four issues in 1953." Surprisingly, six double-column issues were to cost only 11 percent more than four single-column issues! Goddard's budget increases lay not so much with printing costs as with hiring assistance that the University of Iowa had furnished Loehwing. Goddard's major concern was with the number of papers published (69):

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Our goal is to publish 120 papers a year, but you will notice that we have only published 100 [vs. 87 previous year].

You will notice that the number of papers declined during the year is only about one-half that of the previous year [32 vs. 65]. In my judgment this does not reflect in lowering of the standards, but an increase of the quality of the papers submitted to the journal. A fair number of papers which used to be submitted to us and which were primarily of horticultural and of agricultural interest, now go elsewhere.

Goddard's editorial philosophy had been clearly laid out in the first double-column issue of *Plant Physiology* (70).

As was pointed out by the editor twenty-eight years ago, we are interested in articles in *Plant Physiology* that contribute to physiological science without reference to the department of origin or the professional title of the author. Good physiology is often done on plants of economic importance [but] papers which are primarily agricultural, that is, that deal with increased yield of a particular crop, should be submitted to agricultural journals...

...we must expect in the future that articles will occasionally appear which are theoretical, that is, the reinterpretation of previously published material and do not contain new data of their own...The authors of such articles should expect theoretical papers to be sent out to reviewers...We cannot afford to give space to mere speculation that is not based upon an established body of scientific knowledge.

...measurement alone does not constitute scientific investigation...measurements may turn out to be of use to biology only if they are of value in the extension of scientific knowledge. [Printed data] would be far more useful if a time axis were also presented, so that instead of merely having a static picture of the composition [it would be] possible to calculate the changes in composition which occur through time. In the same vein, the presentation of data on the composition of developing fruits and seeds merely as the percentage of protein, for example, without any measure of the number of fruits and seeds analyzed, makes it impossible for the interested reader to recalculate the amount of protein per fruit or seed as it develops.

One member of the editorial board remarks that a paper "should tell a story," and there is much merit in this proposal so that scientific data are presented in a consistent picture and an article develops a thesis.

Despite the irritation over delayed issues, there seems to have been general approval of the change in format and content and editorial policy. Goddard was respected professionally and personally, which dampened criticism. In good measure he was the very model of the modern plant physiologist—but was being drawn off into administration.

In addition to changes in the kind and quality of papers published, there were changes in the service articles—that is, the notes on Society affairs, announcements, obituaries, book reviews, felicitations on retirements and on seventieth birthdays. Loehwing had faithfully maintained these items and had been especially generous

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of space for book reviews and important committee reports, such as the Bonner committee report on "The Status of Plant Physiology in the United States" (24). Loehwing must have shared the view that a society publication should cover the affairs of the society as well as its scholarship.

Goddard made some changes. A letter from Broyer (71) shows that Goddard polled the executive committee on continuing the numerous short book reviews—announcements, really, many of which were of limited interest to plant physiologists (e.g., "Manual of Phycology"; "Natural and Synthetic High Polymers"; "The Yeasts: A Taxonomic Study")—and got approval to limit reviews to subjects truly germane to teaching and research. They were bonafide reviews, signed by the reviewer. Goddard was authorized to assign one of the editorial board as review editor, but this was not done. Publication of important committee reports continued, notably the van Overbeek committee's report on "Nomenclature of Chemical Plant Regulators" (72), complete with the minority report of P. Larsen (73). Naylor and Galston (secretaries during this period) published very informative accounts of the annual meetings, and the description of the sectional meetings also improved. Publication of brief obituaries continued. In general, the "News and Notes" section became more interesting and useful.

As the annual meetings grew larger there were requests from members that abstracts of the papers presented be published in a form suitable for citation. The secretaries had begun printing the abstracts, but in a 6 x 9-inch program booklet. At the 1954 executive committee meeting the secretary was instructed (70) "to explore the possibility of having the abstracts published as bulletins or supplements suitable for binding with volumes of *Plant Physiology*." Naylor wrote Goddard about implementing this directive (74).

As you will no doubt recall, the consensus...was that the A.S.P.P. program would well be published as a separate or supplement to the journal. It was thought by some that our abstracts would be more legitimately citable if they were printed in a format suitable for binding with Plant Physiology. It was also suggested that we might send the program out simultaneously with an issue of Plant Physiology...

Seemans' Printery, which prints Ecology and Ecological Monographs, is printing our program for distribution by August 10th. Page size, format, and typography are the same as for Plant Physiology. An author's index is included. Twenty five hundred copies are being printed. The Physiology Section of the Botanical Society is buying 150, while the remainder are to be distributed to members and subscribers in envelopes prepared and sent to the printer by Stanfield. As it now stands, the cover is designed to carry on the top line the words: Volume 30, Supplement. The second line bears PLANT PHYSIOLOGY as it usually appears on our issues. This is followed by an announcement of the meetings. My concern is this: Do you approve of the cover? Should the pages be designated with Roman or Arabic numerals?

Goddard replied (75), "The cover is by all means satisfactory and I would

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suggest that you number your pages with small Roman numerals since presumably when the supplement is bound by the libraries it will come in the back of Volume 30."

Since this time the abstracts of papers given at the annual meeting have been published as a supplement to the journal (suggestions for papers to be listed by title only were rejected). Citation of these abstracts as scientific literature came into question. In a 1958 letter to his editorial board A. H. Brown, editor-in-chief, listed as a topic for discussion at the Bloomington meeting (76), "The status of journal 'Supplements' and the use of abstracts as legitimate literature citations." In 1960 Brown formally polled the editorial board (77), who voted to insist on published abstracts of papers to be presented at meetings (yes, 9; no, 0; unclear, 1) but were equivocal on authorizing abstract citation (yes, 4; yes with qualifications, 2; no, 5). Scrutiny of the reference lists in *Plant Physiology* shows that both Brown and Martin Gibbs permitted citation of the abstracts.

No details on the transfer of editorship from Goddard to Brown have been found. Goddard was obviously persuaded to complete his five-year appointment, and he finished with Vol. 32, 1957. Brown's appointment was approved at the 1956 executive committee meeting in Storrs as the secretary's minutes (78) tersely report:

A committee under K. V. Thimann, including H. B. Vickery, B. S. Meyer, F. Skoog, A. S. Crafts, and D. R. Goddard reported on the new editor for *Plant Physiology*. Allan H. Brown of the University of Minnesota was chosen for this office and has accepted as of the January issue, 1958. Until that date, Dr. D. R. Goddard of the University of Pennsylvania will continue as editor. It was moved and passed that beginning on January 1, 1958, the editor receive an annual honorarium of \$1000.00 for his services, exclusive of the expenses of publishing and editing the journal.

It appears that the selection of the editor was delegated to the committee, with the executive committee voting approval. Brown had served as an elected member of the editorial board since 1954. His scientific background was similar to Goddard's, but then he had studied under Goddard at Rochester, getting his Ph.D. in botany in 1944. After service with the Radiation Laboratory at MIT, 1944-45, he worked for two years as a research associate and instructor in chemistry at the University of Chicago. He joined the botany faculty at the University of Minnesota in 1947 and was chairman of the department when he became editor of *Plant Physiology*. At this time his research interests were more in photosynthesis than in respiration.

There is little documentation of Brown's editorship other than his annual reports published in *Plant Physiology*. These, however, are quite valuable because they provide, in addition to data, some details and comment on the editorial process and its trials. It is doubtful if the problems Brown faced were much different from those of his predecessors, but he described them for the members. (At the other

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extreme, Loehwing turned in some reports giving only the number of manuscripts received, rejected/withdrawn, published, and in process.)

In his first report (79) Brown gave his objectives as (a) maintaining the standards achieved by his predecessor, (b) speeding up processing of manuscripts, (c) improving the literary quality, and (d) "learning the routine and not so routine aspects of editorship well enough to carry out the various duties with reasonable efficiency and still have time and energy remaining for other activities." He noted that the second objective "has been disappointingly elusive," and presented a breakdown of where the time goes: From receipt through review averages 6.3 weeks; from review to decision, 1.1 weeks; from decision to return from author, 3.9 weeks; from return to publication, 13 weeks; total of 6.2 months. He also admitted he was somewhat naive in his hope to improve literary quality: "He [Brown] has even indulged in limited rewriting of a manuscript or two, but he is not in a position to do much more than this." With respect to having time for other work, he reported that his assistant, Dr. Mary A. Swaebly-Ehrlich, had done an admirable job and he was optimistic. Only one change in policy was noted—disappearance of the "Brief Papers" section. "Short communications now receive the same treatment as longer manuscripts—evaluation by two reviewers and, upon acceptance, publication in turn according to date of receipt." The reason for the policy change is not given. Along with other matters of policy, brief papers were to be discussed with the editorial board at the annual meeting (76). The topics give a picture of editorial concerns:

The following topics are among those which I should like us to discuss:

1. Whether our journal should continue to publish book reviews and, if so, what kind and how managed.
2. Should we contemplate increasing the number of issues per year?
3. To what extent should we cooperate with the promised editorial service pool which the AIBS has been considering?
4. Is the current policy regarding "brief papers" satisfactory?
5. Are we approaching a stage where it would profit us to investigate publication of PLANT PHYSIOLOGY articles on microcard or microtape with only summaries to be generally distributed?
6. Are charges to authors realistic?
 - a. excess pages
 - b. illustrations and tables in excess of 25%
 - c. fee for papers by non-members
7. Should we always enforce reviewer anonymity?
8. The status of journal "Supplements" and the use of abstracts as legitimate literature citations.

The resolution of these matters is not always recorded, but some decisions can be seen in the journal itself. Book reviews were dropped; six issues a year were continued; the AIBS editorial service was not utilized; the brief paper section was dropped; microcards and microtapes were more trouble than picking a journal off

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the shelf, and were not utilized; no change in charges to authors was reported; reviewers remained anonymous; the supplements were continued, and their abstracts were accepted as citations.

So far as most members were concerned, seldom in its 30-odd years had *Plant Physiology* ever provided prompt publication. There are two periods where delays could (and did) occur—the editorial handling of the manuscript through review, revision, and redaction, followed by the printing process with its exchanges of galley and page proofs, printing, and mailing. In his initial year, Brown attempted to set up a printing schedule with Science Press that would reduce printing delays. The schedule proposed by the press did not satisfy him, so he submitted one of his own (80):

The proposed schedule is unfortunately vague about when you will send out galley proof. I am very much in favor of commitments which will expedite prompt handling of this stage and I want to know what to expect from you and what you will expect from us. As you know, we work manuscript by manuscript, not sequentially. I assume that "Dummy to begin coming in..." refers to galley...

The implication of this part of your proposed schedule is that we send you the dummy all pasted up. In the past we have not done this and we do not wish to take on that task...We expect to indicate the order of the articles only at the time the galley is returned...

In setting up the schedule for Vol. 34 [1959], I suggest modifying your proposal and making it generally applicable to all issues as follows:

1. Copy for each issue will be submitted as soon as possible in groups of four or more manuscripts; the last of the copy to be in your hands by the first week of the second month preceding publication (Nov. for Jan. issue, Jan. for March issue, etc.).
2. Last of our galley and author galley to be sent out in the third week of that month (Nov. for Jan. issue, etc.).
3. Corrected galley to be returned by first week of month preceding publication (Dec. for Jan. issue, etc.).
4. Page proof to be sent to us within four working days of receipt of corrected galley (in second week of month preceding publication).
5. Page proof to be returned to you within two working days thereafter.
6. Issue to be in the mail during the first week of the month of publication.
7. Reprint orders to be received with galley proof and reprints to be mailed during second week of month of publication.

I hope that the above schedule coincides with your intent.

Last January I wrote to you regarding the ambiguity of the reprint order form which was in use then and which has not been changed...As I indicated...the confusion brought on by the wording of this order form is a chronic annoyance to us and to our authors. It involves extra paper work on our part and inconveniences the purchasing office of ordering institutions...I enclose suggested copy for the new reprint order forms which I hope you will begin using at once.

Details are lacking, but this emphatic rejoinder and plan must have failed in

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its intent, for Brown's next annual report (81) shows the average time from receipt through publication increased to 7.75 months and that he had changed printers (presumably related events):

Several factors have kept the past year from being monotonous for the editor and his assistant. Chief among these has been a change of printers. The journal is now being printed by Craftsmen, Inc., in Kutztown, Pa., under new contractual arrangements designed (hopefully) to expedite publication of papers through a carefully planned timetable of manuscript processing...

One of our fond hopes this year was that we would shorten the average time between the receipt of a manuscript and its appearance in print. For several reasons [not given] we have lost ground rather than gained...

A chronic uncertainty which plagues the editor's office involves the number of manuscripts which we may expect to receive each year. Past experience is our only guide and, in the last four years, variation in the number of manuscripts submitted has shown no consistent pattern...In the last few months an unseasonably large number of manuscripts has arrived and possibly if this trend continues, we shall be able to consider more frequent publication (as opposed to fatter issues). At present, no change in number of issues per year seems warranted.

The quality of submitted manuscripts seems to the editor to average the same as previously. One not very adequate measure of this is the rejection percentage. This varied between 13% and 18% over the previous three years. This past year it was 15%...

More than ever the editor has come to realize how very dependent the journal is on its large number of volunteer reviewers. It continually amazes this office that reviewers so often seem to devote more effort toward improving a particular paper than the author did in writing it in the first place!...The editor has made note of the following:

I. In spite of numerous outstanding exceptions, the younger plant physiologists usually write the more carefully thought out and useful reviews...

II. Many reviewers who are exceptionally critical and helpful when giving an appraisal of someone else's paper are often surprisingly careless and uncritical when they submit manuscripts themselves...

III. Nearly all authors have been found to accept reviewer's criticism in the proper spirit. A large fraction of all manuscripts are returned for at least some and often major revision...

Brown's next report (82) described a dull year. He noted the appearance of the AIBS publication, *Style Manual for Biological Journals*, and his efforts to conform with its instructions and to get authors to do so. He analyzed the AIBS offer to take on the copy editing and processing of accepted manuscripts and concluded that the present cost of \$2 per page would rise to \$2.75, while the work of his office would be lightened by only 5 to 10 percent. He pointed out the need for improved photographic reproduction and better paper to bring out details of electronmicrographs, chromatographs, and radioautographs; he improved halftone reproduction and bought better paper in an effort to attract valuable articles that were going elsewhere.

Without any comment he reported that the average publication time of manuscripts (receipt to print) for the past year was 9.2 months (the previous two years were 6.2 and 7.75 months, and the data show the increase was primarily due to the time required to print a manuscript). There had also been a substantial increase in manuscripts published (153 vs. 124), manuscripts rejected (19% vs. 15%), and average length of published papers (7 pages vs. 5.5). "Unless there has been a change in the editor's ability to judge, the longer manuscripts do not represent an increase in flagrant padding but hopefully reflect a trend away from 'telegrams' toward more substantial papers." Lastly, he ran over budget for editing, printing, and mailing (\$26,445.63 vs. \$23,111 budgeted).

The following year (1961), Brown's report (83) to the executive committee began by observing that the tabulations he supplied "which make up the bulk of the report fall well short of telling about the true condition of our Journal. That can be judged only by our readers' opinions of it, by the quality—both scientific and literary—of the articles...by the readiness with which contributors of good papers send their manuscripts to PLANT PHYSIOLOGY..." He did not offer a personal appraisal, but moved on to the tabulations.

He noted that the large number of papers categorized as "rejected" or "withdrawn" resulted from applying more rigorous criteria to papers that were returned to the author and never surfaced again. "They move from the active to inactive file. Finally they are forgotten. They can never be properly accounted for in our totals unless, after the passage of a reasonable number of months, they are frankly acknowledged as withdrawn or rejected, which ever seems more appropriate."

Brown next pointed out that compared to previous years "the number of manuscripts on hand (an inverse measure of our processing efficiency) has been steadily decreasing [from 89 in 1957-58 to 59 in 1960-61]." He had other good news; the average receipt-to-print time for manuscripts had been reduced to 7.2 months (from 9.2), and "during the past year all Journal issues have appeared in the same month as the date of issue. We confidently expect this practice to continue. Our arrangements with Craftsmen, Inc. include a workable countdown for the several stages preceding actual publication."

But costs had soared, and Brown wanted \$40,695 budgeted for next year's editing, printing, and mailing. He defended this on the basis of handling and publishing more manuscripts.

Considering first only printing and mailing, our cost per page has not changed significantly over the past year...Nevertheless, larger issues mean more paper and a higher printing and mailing cost per issue. Thus our printing, mailing, and editorial office cost *per copy* rose from \$1.29 in 1959 to \$1.60 in 1961 [for a total cost of] \$9.60 for six issues, a number which may be of at least incidental interest when compared with our membership fee [\$8]...

Our editorial policy has been to publish all manuscripts which come up

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to the standards we are trying to maintain. No manuscript has been rejected for lack of space. No article has been delayed waiting for publication space to become available. While the editor has insisted on condensation of many manuscripts...never has he insisted on shortening an article merely to save space. If this policy is continued, it seems likely that our Journal volumes will continue to increase in size and in overall cost.

Brown's arguments were persuasive and the executive committee approved his proposed budget.

The executive committee then took up a weightier matter (83). "Since the editor's term ends in August 1962, President Naylor was authorized to consult with Editor Brown and to appoint a small committee to be selected from this Editorial Board which will be charged with choosing a new editor. Dr. Brown indicated that he prefers not to serve on this committee, but is willing to act in an advisory capacity if asked to do so." In taking the editorship Brown had specified that he would do so for only one five-year term (personal communication).

A January 22, 1962, letter from Brown to president Harry Beevers (84) indicated that Naylor had not actually appointed a committee during his tenure as president. Brown was quite disturbed by this: "The timing is such that we have no great leeway. The new editor must be selected before this year's AIBS meetings and you know what summer vacations are apt to do to committee functions." However, a subsequent letter from Beevers to members of the editorial board (85) indicated that Naylor had proceeded informally to identify candidates:

In consultation with members of the editorial board whom he was able to see personally, Dr. Naylor explored several possibilities. As you will readily understand, he encountered a good deal of reticence for perfectly valid reasons among likely candidates.

The present position is that two qualified members have indicated their willingness to be considered and these have been heartily endorsed by the advisory group which Dr. Naylor was able to consult.

They are (1) Dr. Martin Gibbs, Department of Biochemistry, Cornell University, Ithaca, New York and (2) Dr. Harlan K. Pratt, Department of Vegetable Crops, University of California, Davis, California.

It is the feeling of the advisory group that either of these gentlemen would do an effective and business like job of editing our journal, although there seems to be some stronger sentiment in favor of Gibbs.

I am transmitting this information in order to get your reaction to these developments. Specifically I am asking that you let me know as soon as possible whether in your estimation these two gentlemen would be acceptable and to express a preference if you have one. In addition if any of you have ideas which we may have overlooked, please let us have them. I should point out however that several possibilities—it would be invidious to mention them by name—have already asked that their names be withdrawn from consideration.

Having arrived at a consensus from the Editorial Board, I can then proceed to a final consideration by the executive committee which of course will

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be strongly influenced by your consideration of this matter.

Would you please reply at once so that this urgent piece of business can be completed without further delay.

Brown replied to this letter (86) by saying that he was pleased to see that "our presidents, past and present, have been moving ahead on the selection of a new editor," and that he knew both candidates and had used them as reviewers (Gibbs was on the editorial board). "Judging from personal contacts with the candidates and from the care they have taken and the competence they have shown in preparing reviews, I feel that either one would be a good bet as editor." Brown declined to vote, adding, however, "if I thought that either candidate would not do a satisfactory job, I should not hesitate to say so."

Details are missing, but Gibbs was selected and approved by the executive committee. In his last annual report (5), Brown gives the members a brief introduction to Gibbs (along with the news that he has the publication time down to 6.7 months, and spent only \$33,121 of the \$40,695 budgeted).

Dr. Gibbs is no stranger to readers of PLANT PHYSIOLOGY since he and his collaborators have published a dozen papers in our journal over the past 15 years. His research has emphasized the exploitation of biochemical tools, especially those involving radioisotopes, in the investigation of physiological problems including the mechanisms of photosynthesis and respiration. He received his formal graduate training at the University of Illinois, and spent 8 years at Brookhaven National Laboratory before going to Cornell. He has been professor there since 1960.

In this report is a footnote explaining that \$167 was spent in sending Brown's assistant, Mrs. L. Sukalo, to Ithaca to familiarize Gibbs with editorial and office routines. Brown finished with thanks to the authors, the reviewers—"some 429 of them"—and his assistants. He made a point of commending Mr. Harry N. Wylie of Craftsmen, Inc., who had done "a remarkably efficient job of preparing layouts, meeting deadlines, catching errors, and in a variety of ways showing a genuine pride in the Journal." (We shall meet Mr. Wylie again.)

In a letter of March 26, 1962, to Beevers (87), Gibbs accepted the position of editor-in-chief and raised some questions. What was the length of tenure? Could John F. Thompson be appointed assistant editor? To whom should he speak about financial matters, such as salary for an editorial assistant—Klein? He needed to talk to Brown, possibly at the Corvallis meetings. Last, "I would like to initiate a change in the routine of refereeing manuscripts. I feel that the Editorial Board should carry more responsibility. All papers with few exceptions should be referred to two of them for opinions. It is their responsibility for farming them out to others if they feel that the paper is not pertinent [to them]."

Beevers's reply is not known, but no problems seem to have appeared. Gibbs recalls the visit of Mrs. Sukalo to assist in getting the editorial office work started,

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and he visited Klein, and Wylie of Craftsmen, Inc. (personal communication). In the end he used the board members as did his predecessors, that is, as principal reviewers.

One point is of special interest. Gibbs does not recall anything being said about the tenure of the office, nor were there any subsequent reappointments (personal communication). In effect he held his editorship on indefinite tenure. Which is surprising, since the constitution at that time clearly called for five-year appointments (Bulletin No. 21, July 1962).

Article IX-5. The editorial board of Plant Physiology shall consist of sixteen members. Ten of these members, one being designated Editor-in-Chief, shall be appointed by the Executive Committee, two each year for a period of five years. Six of these members shall be elected by the Society, two each year for a period of three years. The Editor-in-Chief shall be chairman of the Board. All members of the Board other than the Editor-in-Chief shall be designated as Associate Editors.

An explanation may exist in the changed provisions of Article IX-5 as given in Bulletin No. 22, 1964. At his first meeting with the executive committee as editor-in-chief in 1963 it is recorded (37) that "Editor Gibbs would like more latitude in appointing members to the editorial board, which as presently established often fails to adequately provide strength in those fields from which most manuscripts currently are received." This request, plus several others requiring amendments, led to a revision of the constitution and bylaws. There were significant changes in the description of the editorial board:

Article IX-5. The Editorial Board of Plant Physiology shall consist of a minimum of sixteen members with ten or more to be nominated by the editor with the approval of the Executive Committee. Six of these members shall be elected by the Society, two each year for a period of three years. The editor-in-chief shall be appointed by the Executive Committee and is a member of the board.

The five-year term for appointments to the editorial board was dropped, although maintained in practice (initially Gibbs made appointments for variable terms up to five years "after discussion with all present editorial board members" [88]). The executive committee appointed the editor-in-chief, but for no stated term. There was an implied change in authority from the editor-in-chief being designated as one of ten appointed members of the editorial board to being separately appointed as editor-in-chief and, by virtue of position, being chairman and *de facto* appointer of the board (executive committee approval of appointments was perfunctory, if given at all).

Thus, the appointments of the editor-in-chief and the appointed editorial board members were without stated tenure after 1964, and in the case of Gibbs this appointment policy seems to have been retroactive. No statement on the reason for

this change in policy has been found, but at least one executive committee member questioned it. G. G. Laties wrote on the bottom of his ballot (88a), "Are the length of the appointment period and the staggering provision to be left out? I think at least the duration of tenure as associate editor should be specified."

At this point we leave Gibbs and the journal to the next chapter. As a scientific journal *Plant Physiology* had progressed over these 18 years. Editorship had passed from a nutritionist and general physiologist to a biochemist, paralleling the changing emphasis of the articles published. Although physiological responses were still being recorded and analyzed, there were improved ways of determining why they occurred, and the papers describing these events were giving the journal a bit of scientific sophistication and prestige. But only a bit. Really important papers on plant metabolism, for example, tended to appear in biochemistry journals, which had more prestige.

As *Plant Physiology* gained standing as a scientific journal, however, it lost ground as a Society journal. Shull had worked hard to establish in plant physiologists a sense of identity and collegiality. He did not name it a society *for* plant physiology, but rather a society *of* plant physiologists. He published biographies of the founders of the science, honored eminent plant physiologists, published long obituaries, described laboratories, gave generous space to news and notes, reviewed books widely, used his "Notes" to lecture and encourage, and the like. In short, his journal was part trade paper and news letter. Shull had felt he was fighting a battle for survival and needed to build *esprit de corps*. But the battle, if it was that, had been won, and after a while editors (and members) began to wonder if all this bucking-up wasn't wasting space needed for papers. The emphasis on service to the Society gradually eroded and by 1963 the book reviews were gone, the biographies were gone, the obituaries were short, etc. Publication of research became the overriding mission. However, the members were being better informed on important Society affairs; the reports on the annual and sectional meetings were more complete.

Very early there developed a pervasive opinion that the Society should publish more than research papers. Plant physiology was expanding rapidly, too rapidly for busy teachers and researchers to stay up with the literature. Authoritative summaries of progress in specialized areas were needed. The initial venture in publishing a review volume, "The Structure of Protoplasm," edited by Seifriz (Chapter 3), was a success and resulted in formation of a monograph board. A constitutional provision was introduced (Bulletin No. 15, October 1944) and maintained throughout this period:

Article IX-6. The editorial board of the American Society of Plant Physiologists' Monographs shall consist of an Editor-in-Chief and four members appointed by the Executive Committee, one each year for a term of five years, and of the Editor-in-Chief of *Plant Physiology*. It shall be the duty of the board

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to select the titles of monographs to be published, to determine the fiscal and editorial policies to be followed, and to advise in the selection of key contributors.

In February 1945, W. F. Loomis was elected editor-in-chief of the monograph board (89). He had chaired the committee that published Seifriz's symposium, arranging all details including printing. Went, Hoagland, Shive, and MacKinney were appointed members of the board. The board controlled a "reserve fund" gained from sales of the first volume which they could use for the next publication ("Our royalties on this amounted to \$400 which are now being held by the Monograph Board" [90]).

Loomis had planned a photosynthesis volume before the war, and in 1945 took this up again (91). He now had the collaboration of James Franck, a Nobel prize winner, and was confident of getting contributors for a broad coverage (91). Four years later this second publication appeared (92); "Photosynthesis in Plants", edited by James Franck and W. E. Loomis and published for the Society by State College Press, Ames, Iowa, cost \$7. It contained twenty-two contributions, extending from photosynthesis under field conditions through chlorophyll chemistry and quantum requirements to a memorable article on the comparative biochemistry of photosynthesis by C. B. van Niel (Hales award, 1942). The book sold well.

The issue of *Plant Physiology* that announced publication of the photosynthesis monograph (No. 2, Vol. 24, 1949) also carried a short item stating that Annual Reviews, Inc., was introducing an *Annual Review of Plant Physiology*. The series was successful and was to affect the publication of monographs by the Society.

The next monograph volume, "Growth and Differentiation in Plants," edited by W. E. Loomis, was announced (93) in 1953. "The price will be \$7.50, but if society members order promptly from J. Fisher Stanfield, and accompany their order with a check, they may obtain the book for \$5.50." Documentation is not adequate, but as before Loomis probably underwrote the publication with some of the earnings from the previous monographs, reducing the cost to members. On August 16, 1954, Loomis wrote the following to Kramer, Naylor, Thimann, and J. H. C. Smith (94) (members of the monograph board):

You will be interested to know that our monograph, Growth and Differentiation in Plants, sold half of a printing of 2000 in the first 8 months and seems due for a reprinting next year. This makes it equal to Photosynthesis and considerably above the average monograph in sales.

President Broyer is asking for our recommendations regarding the future of the monograph series. I do not feel that I can spare the time to continue as editor, but I do think there is a place for publications when these present rounded discussions of an important physiological topic. I should like to suggest Mineral Nutrition as a topic that could be so covered, in spite of much, more or less disjointed, recent work. I should like to have, as promptly as possible, your reactions to: (1) continuance of the monograph series, (2) possible changes in procedure, and (3) topics for future consideration.

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We should consider also the use to be made of our reserve fund, now over \$3000. I believe most of this could be transferred to the permanent endowment of the Society.

There is no record of the committee's reactions or of Loomis's recommendations beyond that for a volume on mineral nutrition. Broyer was asking for recommendations because not everyone thought the monograph board should be continued. There were earlier indications of this sentiment. The minutes of the executive committee meeting have the following item (95):

No report was available from the Chairman of the Monograph Board. Some questioned the desirability of continuing the board. Since Dr. Loomis had privately indicated he did not care to be reappointed Editor of Monographs, the matter of finding a new editor is mandatory if Monographs is to continue as a vehicle of publication of the Society. No new members were appointed to the board to replace those retiring this year. The officers were instructed to obtain concrete proposals from the Monograph Board about intentions and policies. The Executive Committee is to be kept informed of developments, and the matter considered more thoroughly at the Executive Committee Meeting in 1954.

In transmitting these minutes to the executive committee, secretary Aubrey Naylor wrote a defense of the monographs as follows (95):

A comment with respect to the Monograph Board is perhaps in order. At the time of our meeting in September the question of its continuation was seriously challenged. The Monograph Board is one of the four standing committees provided for in our constitution [Not quite. It was entered in Article IX, Standing Committees, Section 6, as above, but it was not listed as one of the four—executive, program, finance, and editorial board of the official journal.] Technically, therefore, it is on the same plane as the Editorial Board of Plant Physiology. Apparently it has been the intent of the Society that the Monograph Board serve as a major instrument of publication. Since its inception, two books have appeared and a third volume is ready for sale. Apparently a genuine need is being filled, for both published volumes have made money for the Society. If pre-publication comment means anything, the third volume will sell. One can conclude there is a demand for works at an advanced level in plant physiology...Annual Reviews, valuable as they are, do not replace monographs...At present the Executive Committee is in a position to select an editor who will be willing to catalyze a monographic treatment of some one of the areas needing it...If we rely on presses outside of our control, we are almost at the mercy of chance. As retiring editor, it is to be hoped that Dr. Loomis will present his views.

F. C. Steward, a prominent and outspoken plant physiologist, wrote the following to Naylor (96) on May 8, 1954.

It is very doubtful that I shall be able to attend the meetings of the

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Society...this summer. There is, however, one subject to which I have given some thought and I venture to bring it up in advance...If you think it is in order to do so, your may take this letter as representing a motion which I would be prepared to present to the business meeting if I were there...

For some time I have been concerned with the Society's monographs. At best, they are late, too late to make them very useful. I understand this has given some concern to authors who have contributed chapters. I have, however, stronger criticisms of the latest monograph [Growth and Development in Plants]. I have a review which I wrote by request [he worked with cell and tissue growth] and I am prepared to send it to you if you wish to see it, but it is clear that many of the chapters in this monograph fall short of what one has a right to expect of a volume sponsored by the Society...

We should, I think, re-evaluate the usefulness of the monograph series. It is arguable that the annual reviews of plant physiology have gone far to render these monographs superfluous. If they are to be continued, we should, I think, aim at volumes which reach the highest standards of such publications and they should be a credit to the Society. This means they should be prompt, written by authorities whenever possible, and should be adequately edited to ensure uniformity of style and quality. I do not think that Volume II [Growth and Development in Plants ?] meets these standards. I would be prepared to propose that the monographs be discontinued and if that motion were defeated, I would be prepared to propose that the subject matter of each monograph be decided by the Society and an editor chosen from among its membership for each volume.

I am aware that these views may not be widely held and they may even be regarded in some quarters as provocative. It is for that reason that I am sending this letter so that you can give me an idea how you think we ought to proceed.

A mystery develops here. Despite the evidence for concern, no one seems to have introduced the monographs issue. Neither the 1954 nor 1955 executive committee meeting minutes mention the monograph board. No more monographs were published. So far as the records go the board ceased to exist. However, as late as 1962 the board was still carried in the constitution. As Naylor remembers it (personal communication), there was no one willing to take over from Loomis, and no real concern that there was not. It was a thankless job first to find experts willing to write chapters and then to push and prod to see that they did. At times it was necessary to settle for contributors who were more willing than able. The monograph, when it appeared, was most likely to be late, out of date, and uneven. In all, it was one of those issues that is best resolved by ignoring it, and that is what was done. No great loss occurred because the *Annual Reviews of Plant Physiology* provided up-to-date summaries of research progress in different areas. The *Encyclopedia of Plant Physiology*, published by Springer Verlag, was appearing volume by volume with comprehensive coverage of different fields of interest (unfortunately for language-deficient Americans, many of the articles were in German!). And yet despite the competition the monographs produced sold well, which, as Naylor pointed out, can only mean they filled a need.

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Another publication which filled a need was the career bulletin. Then, as now, there was a continuous call for career information from students and their teachers/advisors. What do plant physiologists do? What are their job opportunities? How can I become one? It took a great deal of time for the secretary to answer these inquiries. In 1952 Crafts reported about 25 inquiries per year, mostly from high school and junior college counselors who requested vocational guidance materials (97), and he had nothing to give them. Finally, a brochure describing the profession was authorized by the executive committee.

The job of writing it fell to the committee on professional status and training chaired by James Bonner, who in 1950 had authored the acclaimed report on the status of plant physiology in the United States (24). At the meetings (95), Bonner announced that the brochure was written and ready for submission to the Society for publication. "It was thought the A.I.B.S. might be interested in publishing the brochure" (95), but they were not. Stanfield had 5,000 copies printed as 4 x 9-inch pamphlets. As he explained to Bonner (98), who had suggested a larger booklet as an investment in the recruiting of new plant physiologists, the smaller size could go out with regular mailings to members, whereas "the size you mentioned would require an odd envelope and thus cost us more." Later he added, "we might make back one-half of the original cost by sales to members at \$1 per dozen postpaid. They would cost us about 2 1/2 cents plus postage and envelopes for mailing." Stanfield was ever attentive to financial security.

The pamphlet (99) had four pages of text with four sections: "Plant Physiology," "Contributions of Plant Physiology to Agriculture," "Training in Plant Physiology," and "Positions Open to Plant Physiologists." Plant physiology was initially defined as "the study of how plants grow and how to control the growth of plants in such a way as to make them most useful to man." In the last paragraph it was called "the science of plant behavior." Throughout there was heavy emphasis on the role of plant physiology in agriculture, as shown in the following excerpts:

A professional plant physiologist has two general kinds of careers open to him. (1) He may work in a university where he will train more plant physiologists and will, in addition, do basic research into the understanding of plants; research which may be applied in the improvement of agricultural practices. (2) The professional plant physiologist may alternately go into one of the applied aspects of his science. He may become an agronomist interested in the improvement of field practices. He may become a plant physiologist in industry interested in finding new ways of using chemicals for controlling the growth of plants and for increasing crop production. He may become a horticulturist interested in growing better fruit crops or in better handling and preservation of fruit products. He may become a forester interested in the improvement of forest management and in increasing the productivity of our timberland. Or he may go into range or pasture work to improve the productivity of our grazing lands...

Through the work of a great number of plant physiologists, the individual

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mineral elements which plants require have become known, and we have found out how to supply them in optimal quantities for many different kinds of crops. This has had an important bearing on the increases in crop yields...

During the past 25 years, plant physiologists have made great strides in understanding the chemical reactions which go on inside plants as they grow, and in finding particular chemicals which can be used to affect these growth controlling processes of the plant. By the use of such specific chemicals as 2,4-D, it has become possible to control flowering, to cause or prevent the fall of leaves and fruit, to hasten the maturing of fruit, and even to kill undesired plants such as weeds. This chemical control of plant growth has raised our agricultural productivity, and has opened many new vistas for future agricultural improvements.

[Plant physiologists have contributed to] understanding photosynthesis [which] will be of importance in the future in helping us to increase our agricultural productivity and thus feed the growing population of the earth.

The highly trained professional plant physiologist of today is, in general, a person who has taken a bachelor's degree in botany, agriculture, forestry, or chemistry and who has then gone on to graduate school and earned a Ph.D. degree. In graduate school he has learned how to carry on independent and original investigation in order to find new facts and make new generalizations...

[After obtaining the Ph.D., the student] may elect to remain in a university or in an experiment station...and continue in basic research; or he may...switch his interests to application in crop production, pest control, in fertilizer practice, in work with soil conditioners, etc.

Apparently, a need was felt to justify the profession in terms of utility in agriculture, which, while real enough, was in some respects misleading. Agricultural departments sometimes hired plant physiologists for basic work on crop problems, but these people rarely became true practicing agronomists, horticulturists, pathologists, or foresters, as suggested. A student comparing *Plant Physiology* with the *Agronomy Journal* (as an example) would readily see differences in the kinds of research done and, more importantly, in the interests and questions underlying the research. "How do I grow a crop?" and "How does a crop grow?" have "crop" and thus "agriculture" in common, but are likely to produce widely different research papers.

At the 1957 meeting at Stanford University, it was reported that the supply of the career bulletin was running low (100). Suggestions that the recent report of the committee on professional status and training, produced under the supervision of V. A. Greulach, be distributed in its place were rejected because it was too technical for vocational guidance, and "a separate report should probably be made, perhaps by another committee, to serve as up-to-date vocational guidance information." Greulach reported that his committee had not yet started on the new career booklet as requested the previous year, but work would start during the coming year.

(The Greulach committee report, "Plant Physiologists in Industry," was printed as a 14-page bound supplement to *Plant Physiology*, Vol. 32, 1957. Replies to a questionnaire indicated about eight percent of all U.S. plant physiologists [135

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people, including "peripherals"] were employed by industry, largely in the fields of growth substances, mineral nutrition, and metabolism and biochemistry. Their work required competency in chemistry, but they were utilized for their understanding of plant life. They received better salaries than academics, but had less freedom in research and publication. The report, though very thoroughly done, does not appear to have had much impact.)

The following year, however, Greulach's committee was dissolved (79). President D. Goddard agreed to appoint a new committee to rewrite the career bulletin, "in view of the continued interest in the pamphlet from high schools and colleges throughout the U. S., and because the pamphlet is now outdated" (79).

At the 1959 meetings in Montreal, it was reported (81) that, "the vocational guidance bulletin, 'Plant Physiology as a Career', newly revised by Dr. A. W. Galston, was distributed. This bulletin has just been printed by the Society. Single copies may be obtained from the executive secretary-treasurer." Galston was coauthor with Bonner of a popular textbook, *Principles of Plant Physiology*, and was fully conversant with the character and scope of the profession. His revision (101) was a comprehensive rewrite and probably presents as clear a picture as we have of how most plant physiologists viewed themselves in 1959.

The pamphlet again measured 4 x 9 inches, but now had seven printed pages of text and was written around six questions: What is plant physiology? What is the importance of plant physiology? What do plant physiologists do? Where do plant physiologists work and how much do they earn? How does one get to be a plant physiologist? What are the professional organizations and publications associated with plant physiology in the United States? The bulletin closed with "Further advice for students contemplating a career as plant physiologists." Each of these subjects was discussed in reasonable detail.

The pamphlet now defined plant physiology as "the study of plant behavior" and as "a part of the science of botany, which is devoted to all aspects of the study of plants." Botanists were classified as taxonomists, morphologists, ecologists, and physiologists. Plant physiologists were described as "interested in the how and why of plant growth and development, chemical transformations that go on within plants, the relation of plant to soil and environment and a myriad of other topics." Agriculture was not mentioned. However, the next section described the total dependence of man on green plants, then brought in the world's geometrically expanding population and asked, "Where will the food come from to feed these people?"

We can assume that continued improvements in plant physiology and related sciences which bear on agricultural practice will help cope with this crisis, just as advances in the sciences related to agriculture in the past 100 years have helped greatly to increase the output potential of every acre now under cultivation. Thus, in a real sense, the plant physiologist is a key man in the perpetual struggle between man and nature. It is the plant physiologist, among

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others, who will help solve the problem of the control of plant growth and development in such a way as to make possible an increased food production to feed the present and anticipated larger population of people...

Thus, in this version, plant physiologists were regarded as botanists, not agriculturists, although their investigations of how a plant grows and develops and responds to the environment provided basic knowledge utilized in agriculture. Did this deemphasis of agricultural work represent a consensus? Examination of Bulletin No. 20, 1958, shows one-third of the members having addresses indicative of employment by an agricultural unit (102), and it is doubtful if many of them considered themselves botanists (plant scientists, perhaps). Then, as now, part of the basic physiological knowledge utilized in agriculture came from agriculture. Nitrogen metabolism is just as likely to be investigated in an agricultural laboratory by agricultural scientists as in a botanical laboratory by botanists, perhaps more so. The fundamentals of physiology are integral to all plant sciences and are indifferent to whether the motivation for study is simple curiosity or practical application or what is likely to get grant support.

Galston placed the work of plant physiologists into four categories: (a) basic research, (b) applied and developmental research, (c) teaching, and (d), administrative and governmental work. Basic research was done in universities, experiment stations, government laboratories, and private industry. Active research areas were photosynthesis, mineral nutrition, water relations, growth and differentiation, biochemistry, and interdisciplinary plant physiology (*e.g.*, physiological genetics, host-pathogen relations). Each got a brief, well-written, informative discussion. Teaching was usually done by members of botany or biology departments, though many plant physiologists were found in more applied departments, and involved both elementary and advanced level courses and the supervision of graduate student research. Applied work brought the plant physiologist into many fields, and examples were given. "Almost any phase of agriculture which would be improved by a more precise knowledge of the functioning of plants is amenable to cooperation with plant physiologists. The field is growing constantly and the list of plant physiological applications can be added to day by day." As for administration, "we live in an era when federal and state governments are committed very strongly to a policy of the support of research." If the funds for plant research were to be allocated intelligently the administrator must know plants, government organization, and how to work with people. "In recent years, many plant physiologists have found their way into responsible positions of administration in government, in universities, and in industry."

Plant physiologists of 1959 worked mainly in colleges and universities, experiment stations, industrial concerns, information services, publishing houses, and a variety of smaller enterprises. A beginning instructor at a university probably started at \$5000-\$5500 per year. As a "full professor in a first-rate university, he can plan to earn between \$12,000 and \$15,000 or more per annum." In industry,

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salaries started at \$7000 to \$8500 and rose much higher. Government salaries tended to be midway between industry and universities.

Although some plant physiologists did not have the Ph.D. degree, the majority did, and it was becoming more important to have the degree. Undergraduates usually majored in botany, including several courses in plant physiology, mathematics, physics, chemistry, and languages. There were 20 to 30 centers for graduate study of plant physiology, which normally took three or four years. For the Ph.D. "the student must usually take additional course work...he must pass at least two foreign language examinations...and finally satisfy his faculty advisor and his department that he is competent to conduct research...by the production and oral defense of a thesis." While in training, a graduate student "is usually able to earn his tuition and maintenance costs through a teaching assistantship or fellowship..." In recent years it had become customary for the Ph.D. to be followed by a year or two of postdoctoral training: "after several years of postdoctoral research, the new plant physiologist has achieved enough research experience to permit him to step into a somewhat higher level job than a man without such extra training." (It is not mentioned that getting a position was easier with postdoctoral research, so perhaps at that time it was not so important.)

The discussion of professional organizations and publications started with *Plant Physiology* and ASPP, "the major professional organization for plant physiologists in the United States." The Botanical Society of America was recognized as including many plant physiologists as members and its journal, *American Journal of Botany*, as publishing many plant physiological articles and being read by most plant physiologists. Both organizations belonged to AIBS, a federation of organizations in all fields of biology.

The "further advice" was to refer questions to a plant physiologist or to the executive secretary-treasurer, who would relay the letter to an appropriate person for an answer. Any student with competence in science and a desire to do research and teaching in a field of great potential usefulness would do well to investigate plant physiology, which was a "road to a worthwhile and challenging profession for any biologist with an experimental turn of mind."

Galston's career bulletin seems also to have been in demand, although quantitative data are lacking. (Correspondence indicates that another bulletin sent out was "Career Opportunities in Biology," prepared by the National Research Council/National Academy of Sciences.)

Meetings

Table 12 lists the locations of the annual meetings during this period. Meetings with AAAS were resumed in St. Louis (103) on March 28-30, 1946. These were actually the "Christmas" meetings of 1945, delayed three months due to unspecified difficulties. The executive committee meeting was called for a day

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earlier, March 27, in order to allow more time for accumulated business. As Loehwing commented to R. B. Withrow (104), "I was also very much pleased that we held the Executive Committee meetings in advance, a practice which might well merit consideration in the future as a policy. We really got some things settled, which is more than usually was accomplished..." Having the executive committee meetings a day before the formal sessions gradually became a custom. It permitted executive committee members to attend the sessions that followed.

The St. Louis meeting also showed the trend toward annual business meetings that were little more than brief, poorly attended formalities. The report reads (103), "After acceptance of the officers' and committees' reports, it was voted by attending members that the editor-in-chief be authorized to publish dates of receipt and final acceptance of papers published in *Plant Physiology*." And that's all. The executive committee, on the other hand, had to hold two sessions. Except for an occasional stirring issue introduced on the floor, only on mail ballots were members involved in making significant decisions. Even then the questions were being posed and proofed by the officers and executive committee, with ballots sent out because the constitution required it. As the Society grew, the members tended to leave decisions to the executive, voting approval when required. Better attendance was obtained by holding the annual business meeting in conjunction with the banquet, but this move brought protests of forcing members to pay for the banquet in order to attend. Skoog (105) made such a protest to Crafts, who replied (106) that, in his experience, meetings tended to be hurried affairs "in which the business of the Society is rushed through so that the members may get away. Our banquet meetings...have given time for adequate discussion of our Society problems." Nonetheless, the banquet atmosphere was not conducive to business, and in 1957 separate annual meetings were again scheduled (100).

This first postwar meeting was unexpectedly well attended. There were two parallel sessions held jointly with the Physiological Section, and others were held jointly with Section G (botanical sciences) and with the horticulturists (ASHS) (103). Loehwing wrote Withrow (104), "I realize that the St. Louis meeting was much larger than had been anticipated, and I myself was in favor of joint sessions...however, I think [it] would be desirable if the A.S.P.P. were to retain its own identity for presentation of professional individual papers."

Loehwing's opinion was shared by others, but throughout this period the joint sessions with the Section were continued. As long as the societies met at a common time and place, the majority of plant physiologists preferred joint sessions. The bitterness between Society and Section had retired or died with those who had nursed it, and what was left was the awkwardness of pooling two separately derived physiology programs. Informally, the secretaries were able to work out the difficulties as indicated in a January 1951 letter from secretary Broyer to president Thimann (107):

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I might further suggest your appointment of E. M. Palmquist to the program committee. He is a member of both B.S.A. and A.S.P.P. as many of us are. He is also Secretary of the Physiological Section with which our papers are dovetailed. He will according to recent custom handle the overall coordination of contributed papers for both groups. I did it last year for both. In due time, the elected Secretary for 1951-53 should also go on this committee—either he or I acting as chairman for this year. I will of necessity have to carry a large part of the load since he will not take office until July 1 and the program will be essentially if not entirely completed by then.

This type of cooperation appears to have continued for some years and had formal support in a committee report. At the 1950 meeting in Columbus, appointment of a committee to review relationships between the Society and the Section was authorized (108). The appointment was made at the 1951 meeting (32) in the form of a joint committee of the Society and the Section under B. S. Meyer as chairman (he had served both as president of the Society and chairman of the Section). The committee reported to both BSA and ASPP as follows (109):

(1) We recommend continuation of the present policy of joint sessions... as the program arrangement which best serves the interests of both organizations and the continued development of plant physiology as a science.

Comment: The advantages of this arrangement are self-evident and it appears to have the approval of an overwhelming majority of members in both the Society and in the Section. Some minor difficulties have arisen because the two organizations have not always followed the same policies with regard to permissible length of papers, number which could be presented by one author, etc...It is desirable that a permanent policy of uniform regulations regarding submission of papers be adopted...

(2) We recommend that it be the general policy of the Botanical Society of America and the American Society of Plant Physiologists to hold joint annual meetings.

Comment: This recommendation is a necessary corollary to the preceding one. As long as both societies continue to meet under the auspices of the American Institute of Biological Sciences such joint meetings will be automatic. The A.I.B.S. has recently outlined the program of meetings which it plans to sponsor through 1957, which should simplify the problem of advance planning... This recommendation does not imply that an occasional exception to such a general policy of joint meetings would not be permissible and perhaps even desirable.

(3) We recommend that abstracts of all papers presented at joint sessions ...be mimeographed in suitable form and supplied to all members of both the Section and the Society in advance...

Comment: For years the A.S.P.P. has mimeographed and sent out to its members abstracts of papers presented at annual meetings. Abstracts of papers submitted to the Physiol. Sec. were formerly printed in the American Journal of Botany, but this practice has been discontinued. The cost of such a procedure would presumably be shared by the Section and the Society.

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(4) We recommend continuance of this committee for one more year, in order that further consideration can be given to other matters which have been suggested as coming within its province.

Comment: For reasons largely beyond the control of the committee its operation did not begin until late March of the current year [1952]. Sufficient time has not been at its disposal to give adequate consideration to certain proposals which have been suggested for its consideration. Among these are (1) the possibility of joint memberships between the two societies, (2) relationships between the journals "Plant Physiology" and the "American Journal of Botany", (3) the feasibility of closer affiliation or possibly even merger, in some form or another, of these two and perhaps other botanical societies, and (4) the problem of recruitment of well-qualified persons into professional work in plant physiology and the development of vocational guidance materials in plant physiology. It is possible that the Committee may have no additional recommendations to make after deliberating these matters at greater length, but the way should be left open for possible further recommendations at the annual meetings of 1953.

However, when ASPP secretary Crafts asked Meyer to prepare a report for the 1953 meetings, he replied (110) that the committee "has no further report to make beyond that made last year, and I am now recommending that this committee be discharged." And, at the 1953 meeting, it was. Although with good will it was possible for plant physiologists of Society and Section (many belonged to both) to cooperate in talking about their research at the annual meeting, this good will did not extend to joint membership or joint journal production. The attitudes back of this are found in a letter (111) P. J. Kramer, chairman of the Section, wrote Crafts in response to an inquiry about program cooperation:

Thanks for the carbon copy of your letter to Dr. Rosene [secretary of the Section, and also a member of the Society]. I wrote to her some days ago stating that it was my understanding and hope that she would cooperate with you in arranging the program of physiological papers...

I received a letter from B. S. Meyer concerning the committee on inter-relationships between the Section and the Society. This has always been a rather vexatious problem to me, the more so because I see no easy solution.

I was a bit embarrassed over being elected chairman of the Section because I have several times questioned whether or not there is any excuse for the existence of the section, but as chairman I can scarcely argue this viewpoint. At least I am reasonably certain that I would not have been elected chairman if my feelings were widely known. I regret that the Botanical Society did not evolve as did the American Chemical Society which has held its specialized divisions under the parent society. Several of the sections of the Botanical Society serve useful purposes, but a physiological section isn't really needed since most plant physiologists already belong to the A.S.P.P. and the remainder ought to join it.

I hope that we can continue our joint sessions and if possible provide abstracts of papers presented at these meetings, regardless of whether they are presented by Section or Society members. Perhaps eventually the Section can drop its program and turn physiology over to the A.S.P.P.

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A move in the direction of turning physiology over to ASPP occurred on the part of the Physiological Section in 1961. The section proposed maintaining itself as a paper section of BSA only (no officers, no meetings) for the purpose of channeling submitted papers to ASPP meetings. The Society secretary would also serve as the Section secretary. The ASPP executive committee discussed this at the Corvallis meetings (5) in 1962:

The impending transfer of authority of the physiological section, Botanical Society of America, to our society was discussed. The general concept was received sympathetically, except for the contemplated provision that our representative to the Botanical Society governing board be required to be a member of the Botanical Society of America. It was agreed that such restrictions were not compatible with the independent nature of our society, although our president would undoubtedly seek to make an appointment agreeable to both societies.

Nothing seems to have come of this proposal. Cooperation on programs altered nothing on attitudes toward organization—all the reasons for having a separate society for plant physiologists were still present.

There was growing dissatisfaction with the AAAS meetings, which had become too large for good management. The various plant science societies could be assigned to different hotels, blocks apart, which inhibited interaction (not all plant physiologists were indifferent to papers on anatomy, horticulture, fungi, etc.). There was competition for desirable meeting rooms. The overcrowded St. Louis meeting had been particularly troublesome. The American Phytopathological Society had decided not to meet with AAAS in Boston in December 1946, but to meet separately in Cincinnati. Withrow, who was a conscientious secretary, wrote to H. A. Meyerhof (112), secretary of AAAS, about the pathologists' decision, which was based on the great success of meeting by themselves two years previously when there was no AAAS meeting.

...it would be most unfortunate if the trend of the Phytopathological Society led to different plant science societies meeting in different cities at the same time. Undoubtedly the annual meetings of the A.A.A.S. are rapidly becoming too large for any one city. The membership of the various scientific societies is increasing and the proportion of members attending the annual meetings is likewise increasing. It appears to be necessary for some kind of provision to be made so that the A.A.A.S. can meet in different cities at the same time in order to relieve the congested conditions that are developing. I would like to suggest that the A.A.A.S. initiate such a division along natural cleavage lines...Since there is a great bond of interest between the various organizations of the plant science group, they could meet in the same city and not produce the overcrowded condition that is developing with the A.A.A.S. as a whole.

Would it be possible for the Botanical Society of America, the Mycological Society of America, the American Society for Horticultural Science and the

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A.S.P.P. to all meet in Cincinnati with the Phytopathological Society this Christmas? I know the Horticultural Society is planning such a move and the Mycological Society feels that if the Horticultural Society does that they will have to do likewise. If the Horticultural Society goes to Cincinnati, I know that many of the members of our Society will attend the Cincinnati meeting rather than those of our own Society...For many of us in the A.S.P.P. there is almost equal interest in the A.S.P.P. and the Horticultural Society. There is likewise almost equal interest in the A.S.P.P. and the Botanical Society. [In 1946, 233 ASPP members belonged to BSA, 158 belonged to ASHS, and 41 belonged to both.]

Subsequent correspondence is missing, but the result is clear (113): ASPP met in Boston, not Cincinnati, in December 1946. There were 63 papers given in five joint sessions with the Physiological Section, and there were three symposiums, one given jointly with the horticulturists, who evidently changed their minds about Cincinnati. No mention is made of meeting problems, but the agenda for the executive committee meeting says (114), "The Committee should carefully consider what course of action should be taken regarding the various proposals for the unification of biological societies. This subject will be discussed in a joint meeting of botanical societies Friday afternoon."

Nothing is available about this meeting, but a breakaway from AAAS with its comprehensive science meetings was in the air. The published report of the Chicago meeting with AAAS in December 1947 states (18), "With an attendance of 80 [at the business meeting] it was voted to affiliate as a charter member with the American Institute of Biological Sciences on an experimental basis." Wadleigh's minutes of the meeting (115) say nothing about an experimental basis: "It was moved and seconded that the American Society of Plant Physiologists take immediate steps to become affiliated with the American Institute of Biological Sciences under full charter membership. Passed without a dissenting vote." (Wadleigh's minutes are probably accurate.)

Emphatic or tentative, the vote represented a step toward an affiliation with other plant science societies. AIBS was, however, an affiliation of biological societies, and thus broader than many wanted. On the positive side, the striking similarity of plant and animal cells at the biochemical level was emerging, and, for some members, the opportunity to hear relevant papers from the animal side compensated for the increased size of the meetings.

On November 7, 1947, Wadleigh wrote to the executive committee (116), "The A.A.A.S. declines to sponsor meetings of affiliated societies at their 1948 meeting in Washington, D.C. next September. If the American Society of Plant Physiologists holds a meeting during 1948 it will be through their own sponsorship." He went on to say that the secretaries of the plant science societies had been corresponding on the possibility of a joint plant science meeting in Cincinnati in September 1948. This possibility was taken up at the Chicago meeting where the decision was left to the secretaries of the societies (18). The planners went ahead with the meeting in Cincinnati, September 8-10, 1948. The Botanical Society

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backed out, but, as reported in the journal (117), the meeting "was well attended even though it was the first meeting of the Society held independently of the large A.A.A.S. conventions. The horticulturists met at the same time and place and the usual fine spirit of cooperation and fellowship between the groups was much in evidence." The report ended, "Plans have been initiated for the Society to meet with the A.A.A.S. during the Christmas holidays of 1949."

Earlier, in April 1948, Wadleigh had reported to the executive committee (118) that Frits Went, president, had inquired "as to the possibility of [AIBS] making the arrangements for the meetings of A.S.P.P. along with other plant science societies in 1949." The answer (118) was that "at the present time the A.I.B.S. is inadequately organized to assume this responsibility." There was some thought of meeting with the American Society of Agronomy in Milwaukee in October 1949, but the final decision was to meet once more with AAAS in New York.

There were problems with New York meetings. Projection of slides had to be done by union operators at \$20 per session, which with eight to ten sessions was a serious expense (119). At first, AAAS offered to pick up the tab, as it usually did, out of registration fees, "providing that the affiliated society requires registration for attendance at sessions." Wadleigh wrote the executive committee (119), "Union operators are sufficiently well organized in New York so that they will undoubtedly prohibit the arrangement we used in Cincinnati, whereby we provided our own projection equipment and had some of our own members do the operating." He continued, "Now I know that most of you will not be in favor of seeing our meetings 'policed'... Yet, it is questionable if the Society could stand the financial burden which would be incurred by having to pay for the projection equipment and operators..." Later the AAAS retracted the offer to pay for the projection, but offered alternative plans for providing societies with some financial assistance. Wadleigh asked the executive committee to vote on these plans (120).

Broyer was incensed over this union rule, consulted with a number of members, and wrote a two-page protest to Wadleigh (121).

The meetings of this Society as well as others are private meetings and are not subject to admission by any but members...any individual member may as his personal right and prerogative, borrow a projector and may individually project slides or film for his associates or may request an associate to project them for him...there is no infringement upon the rights of union members since no fee or salary is paid to any operator...

The gathering is likened to a personal gathering in a home or in a public institution, or in a room hired in a hotel or elsewhere, at which any individual desires to present pictures or film for the interest of his invited associates, guests or family; or it may be likened to an organization of charitable or other nature which desires to offer non-commercial information...

Our local members would rather circumvent this difficulty if possible at this time, by presenting their material in chart form or by use of a blackboard, but not yielding in any way to the basic principle involved...

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Wadleigh made the practical reply (122):

I am completely in accord with the suggestions you have made. In fact, we of the Program Committee effected just such a policy at the Cincinnati meetings when we were on our own...

However, the New York meeting will be under the auspices of A.A.A.S. and under such arrangements the A.A.A.S. decides general policy...

I fear that you are not fully cognizant as to how thoroughly union operators can hog-tie a scientific meeting. I attended an A.A.A.S. Council meeting in Chicago at which Dr. F. R. Moulton explained to us how difficult it is to deal with union operators. He stated that in the St. Louis meetings one of the scientific exhibits contained an automatic projection machine. The local union boss demanded that two operators be hired to stand by while this automatic machine operated. Dr. Moulton refused to do this. The union boss then stated that the operators would either be put on or he would close the whole place down in an hour. In order to avoid a showdown, the city of St. Louis hired the necessary two operators to stand by.

It just simply will not be possible to use projection machinery in New York City without hiring union operators. The expense in New York is going to be terrific. The rental on each machine will be \$5.00 a session, the services of a union operator for each session will be \$15.00, other incidental costs will run \$5.00 a session.

To effect the recommendations you have made, our only choice would be that of pulling out of the New York meetings. I feel that plans have already progressed too far to make a change in meeting place...

In the end the Society accepted the AAAS suggestion (123) that "each society will pay all of its projection costs but it will receive a contribution from the AAAS, the exact amount determined equally by (1) the average percentage of registrants at its sessions, and (2) the proportion of its membership also members of the Association."

By the following year AIBS was sufficiently organized to sponsor a September meeting in Columbus for its adherent biological societies. The executive committee gave 12 to 1 approval for meeting with AIBS in early fall at a university using dormitory facilities (120), thus establishing the pattern for subsequent meetings of this period. They were held with AIBS in late August or early September at the end of the academic year when accommodations could be arranged at a university campus: costs were modest; summer sessions at universities and colleges were over, and the trip could be combined with a family vacation; and for academics it provided an opportunity to visit the other guy's campus and laboratory.

There was a bit of hesitation before committing the Society to AIBS meetings. At Columbus it was decided to meet the following year with AIBS in Minneapolis, but no further commitment was made. After the meeting, Broyer, the secretary, wrote as follows to president Thimann (107):

Following our decision to go along with the A.S.H.S. and the B.S.A. to

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Minneapolis we were further informed of the other societies decision for further years. The A.S.H.S. is committed for 5 years (1950 included) to go where the A.I.B.S. sponsors. The B.S.A. voted to go...in 1951, 1952 and 1953. I think...I should poll the Executive Committee on a yes or no vote on doing likewise for 1952 and 1953...I would favor going where these other two societies have directed, for they are those most directly interested mutually in research problems. I have entered quotes on the word "West" [odd—"West" does not appear previously in this letter] for the A.A.A.S. will never sponsor a really western annual winter meeting. They indicate that they now sponsor summer meetings in this area (also the South and Southwest) and consider this adequate. The A.I.B.S. has not indicated whether or not they would ever sponsor meetings in the far west, but my inkling is that the Mississippi line holds a fascination for them as well...[AIBS meetings were held at Stanford in 1957 and Oregon State in 1962].

Nothing drastic can be done to get "physiological-biochemists" to publish in *Plant Physiology*. All we can do is hope that word gets to members of influence in each institution who will urge strongly that their papers and those of their colleagues be so published. We are committed to welcome them and I know they will be an asset to our journal.

Clearly, in this period, a major factor in selection of a meeting site was whether other plant science societies would also attend. The executive committee agreed to meet with AIBS in 1952 and again in 1953.

The second paragraph in Broyer's letter is included here because it bears on a growing concern of some members that the Society's affiliations and activities were not catching up with advancements in the science. It would help if there were ties to biochemistry where important developments were occurring. As it was, few papers dealing with modern plant biochemistry were submitted to *Plant Physiology*. The report on the Columbus business meeting (108) says, "One phase of discussion pointed up the necessity of encouraging the publication of physiological papers with biochemical aspects in our journal." But in 1950, neither at the meetings nor in the journal was there much to attract biochemists.

A reduced participation in the AIBS meetings occurred in 1959 when the Society also met at the IXth International Botanical Congress at McGill University and the University of Montreal. It was intended to forego meeting with AIBS at Pennsylvania State University in favor of the Congress, but this proposal ran into opposition at the 1958 Bloomington meeting (79). "In spite of a mail ballot which had indicated the majority of the executive committee being opposed to meeting with the AIBS in 1959, the year of the International Congress, a minority opinion in favor of meeting with the AIBS was vigorously expressed." It was decided to take the matter to the members at the annual business meeting, and, on this occasion, they were stirred into activity (79):

During a discussion concerning whether or not our Society should meet with the AIBS at Pennsylvania State University in 1959, Dr. Bandurski pointed

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out that the enthusiast could look forward to four weeks of continuous meetings in 1959. After a lively discussion a vote showed the majority of members wished to meet with the AIBS in 1959. Dr. A. Brown moved that the Society hold its 1959 business meeting in Montreal in connection with the International Botanical Congress. This proposal was seconded and passed. The change in by-laws to allow the establishment of Emeritus status was voted on and passed as was the proposal to stabilize the executive committee membership by election of representative[s] by local section[s]. This latter proposal, however, was amended to include the statement that members of sections who are not members of the Society cannot serve as representatives on the executive committee. Following a discussion, the former ruling that student members are not entitled to vote was rescinded.

Both the executive committee and business meetings were held at McGill (81), August 25-26, 1959. A good many of the members gave papers at the Congress and did not repeat these the following week at the AIBS meetings in State College. Consequently, ASPP was poorly represented (see number of contributed papers, Table 12), as were some other societies. The enthusiasm of those insisting on the AIBS meeting was inadequate to make it thrive.

There was one earlier occasion on which the dutiful members attending the annual business meeting were reported to be moved to a "lively" discussion. This session occurred at the 1954 Gainesville meeting (70), at a time when the McCarthy hearings were having an impact on the national political scene:

Dr. Arthur Galston introduced a resolution that the American Society of Plant Physiologists go on record as opposing the apparent infiltration of influence of political feelings into the making of grants in support of scientific research. A lively debate followed—particularly over the wording of the resolution. After slight modification, the resolution was finally accepted by majority vote and the secretary instructed to transmit the resolution to the appropriate authorities. The resolution reads as follows:

"It has come to the attention of the American Society of Plant Physiologists that political criteria are now being employed by the Department of Health, Education and Welfare in awarding of research grants through the U.S. Public Health Service. We deplore this practice, for we feel the introduction of such political considerations into scientific effort to be contrary to American tradition and to be harmful to science as a whole. We respectfully urge a return to former selection procedures, in which only the scientific merit of the research proposal and the integrity and research record of the investigator are judged."

Aubrey Naylor, secretary, forwarded the resolution, by way of AIBS, to D. W. Bronk, president of the National Academy of Sciences. The minutes of the 1955 meeting (23) report that Dr. Bronk "had energetically taken up this question with Mrs. Hobby [Secretary of HEW]. Dr. Bronk described his activities in this direction and referred 'off the record' to high level discussions of the problem which he had attended at the White House." A motion of appreciation to Dr. Bronk was approved.

The original resolution infuriated Stanfield, who seems to have shared

Senator McCarthy's phobias. Stanfield saw it as a "pressure move" that got a small group to endorse, on behalf of the Society, a statement of dubious merit and intent: "THIS DOES NOT REPRESENT THE MAJORITY OPINION in our Society and I do not mind stating that anywhere (124)." He also wrote to Bronk (125), saying that only 60 members out of 1100 were present, and 20 percent of these were strongly opposed. The resolution was introduced in the dying minutes of the meeting, and not more than 15 minutes were given to discussion. "To say that it represents the American Society of Plant Physiologists is rather ludicrous." He ends by hoping Bronk will weigh the matter carefully. No record exists of further action on the part of the Society (McCarthyism became a pejorative for reckless accusations of disloyalty, and as such was weakened to the point of ineffectiveness).

It has already been pointed out that beginning in 1955 the abstracts of contributed papers presented at the annual meeting were printed as a supplement to *Plant Physiology*, and the journal accepted these as literature citations. Although it is difficult to document, this process seems to have given the abstracts standing as scientific literature they did not have when distributed on mimeographed sheets or printed in 6 x 9-inch pamphlets. In turn, the annual meeting assumed greater importance in reporting experiments, and plant physiologists made real efforts to attend. It has not been possible to assemble attendance records, but the increasing size of the meetings can be seen in the number of contributed papers (Table 12). Notice, however, that location was important—West Coast meetings doubled as vacation trips and thus drew big crowds, whereas Oklahoma and Florida, in the heat of late summer, did not.

One aspect of publishing abstracts was troublesome; abstracts were submitted and printed, but the author did not have to appear to give the paper. As Steward complained to Naylor (126), "we now have abstracts in existence of papers which were never delivered and we have really no reason to believe that there is any evidence behind them." He suggested that before abstracts were bound with the journals, those not given should be stamped "cancelled", or "paper not delivered". The concern was taken up at the 1955 meeting (23), and recognized as serious, but no action was taken.

The prewar summer meetings sponsored by AAAS were never resumed.

Constitution and Bylaws

Hardly a year went by without some change to the constitution and bylaws being proposed, and sometimes enacted. The basic reason for this continual activity can be traced to Shull, who saw security in well-defined "rules." The constitution and bylaws were written to provide such close guidance that no group with questionable motives could take over the Society. Oddly enough, open-ended authority was given to the executive committee which "shall have power to consider and act upon all matters not reserved to the Society as a whole" (Bylaws, Section 2a). Reserved, that is, in the constitution and bylaws, and enough was specified to

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narrow the executive committee's activities.

And the Society was conditioned to think in terms of detailed rules of procedure. As an example, in 1953 Shull proposed to president Crafts (2), "Why not simply provide that the Secretary have his way paid to the two meetings for which he prepares the program? A simple item in the bylaws could take care of it." Yes, it could, but a simpler way to take care of it would have been a provision which directed the executive secretary-treasurer to submit an annual operations budget for approval of the executive committee. Secretarial travel could be entered as a budget item and examined annually on its merits. It took many years for the Society to delegate authority and responsibility in this fashion. As it was, small problems continually arose that required specific changes in the constitution or the bylaws or both to solve. Either that or ignore the constitution and do what had to be done.

(Attention must be called to the fact that only copies of the constitution and bylaws as published in the directories [bulletins] for 1944, 1947, 1955, 1958, and 1962, have been available for following the changes in this period. Furthermore, the results on balloting for amendments are not always available, although in the absence of contrary evidence it appears safe to assume that amendments placed on the ballot were approved.)

The first problem dealt with was the resolution of tie votes, the ballot on which was authorized at the 1946 St. Louis meeting (103). This was discussed previously under "Officers."

At the Boston meeting in December 1946, "several constitutional changes relative to corresponding members and the Program Committee were approved for presentation to the membership in March by mail ballot. These concern the privilege of corresponding members to receive the journal, as well as the bulletins, without charge. It was also recommended that the Secretary act as Chairman of the Program Committee"(113).

The amendment to make the secretary chairman of the program committee was approved, since Article IX in Bulletin No. 19, 1955, says "The Secretary shall be chairman of the [program] committee and the two additional members shall be appointed by the President." However, with respect to corresponding members receiving the journal, Article III-4 remains unchanged, "They [corresponding members] shall be entitled to receive the Bulletin throughout life, but not the Journal unless they are also annual or life members." Wadleigh, then the secretary, got into an embarrassing situation over this article in 1948, which he explained to Loehwing (127):

I am greatly embarrassed that I have committed an error with respect to the prerogatives of Corresponding Members.

At the time of the Chicago meetings, I was asked to write the four plant physiologists in Europe, who had been elected to corresponding membership, and advise them of this honor. It is my recollection that I was informed to advise them that the corresponding membership was permitted to receive the journal

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without dues. I found, in the minutes of the Boston meetings, a statement to the effect that the Executive Committee had voted to honor the corresponding members with this prerogative. Since I was inadequately familiar with the affairs of the Society at that time, I proceeded in good faith to advise these corresponding members that they were privileged to receive the journal without dues.

Stanfield now advises me that that isn't legal and he is right. I have looked further into Withrow's records and find that Dr. Shull later vetoed the action of the Executive Committee.

And how could Dr. Shull veto an action of the executive committee? Easy. He had been elected a member of the executive committee in 1944, and, although he pointed out that this was an error since he was already a member by reason of his editorship, he did not decline the honor and continued on after retiring as editor. Bulletin No. 16, 1947, lists him as a member of the executive committee. His solitary negative vote could, and did, deny the journal to the corresponding members. Shull had obtained this important regulatory constraint on amendments in 1929 when he chaired the committee for revision of the constitution and bylaws. Article XI (Bulletin No. 5, 1929) said a proposal for an amendment had to be submitted to the secretary two months in advance of the annual election and that "such proposals, before they can be voted on must be reviewed as to their desirability by the Executive Committee, and must receive unanimous approval of that committee." Given unanimous approval, the secretary was to place the amendment on the ballot, and "a two-thirds majority of those voting shall be required to pass any proposed amendment." One negative vote, or a refusal to vote, at the executive committee level, was all that would be required to prevent an amendment from being placed on the ballot.

Veto power came up at the 1947 meeting in Chicago as one of two interrelated problems. First, the dues had to be increased by a minimum of \$1 to cover the AIBS assessment, and the dues were fixed at \$5 by Article III-3 of the constitution. Thus, a constitutional amendment was required. Second, it was clear that even without Shull (his term ended June 30, 1947) it would be difficult to secure unanimous approval of amendments—some members were always absent from meetings. Wadleigh sent a ballot to the executive committee (128) on February 5, 1948, with proposals to reduce the unanimous approval to three-fourths and to raise the dues to \$6. On June 14 he reported (129):

Two amendments to the constitution were considered:

1. Change the requirement of a unanimous vote by the Executive Committee on constitutional amendments to a three-fourths vote.
2. Raise the dues from five dollars to six dollars a year.

Since all members did not vote on these proposed amendments it is questionable if they could be considered as unanimously adopted even if all the members who did vote were of the affirmative. A negative vote was received for each proposed amendment, hence they could not be placed on the annual ballot.

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In this case, the ballots were filed along with the copy of Wadleigh's letter and have been preserved. Someone, presumably Wadleigh, wrote names on the ballots where these were not signed (the ballots seem to have been identified by return address). Stanfield cast the negative votes. O. A. Leonard, representative for the Southern section, also voted 'No' originally, but changed his vote after being told by Went that he was opposing a much needed constitutional change (130).

The latest directory available for this period, Bulletin No. 21, 1962, still requires a unanimous vote for submission of amendments to the members. It appears that the veto power of a single executive committee member was maintained until 1964, when a general updating of the constitution permitted balloting on proposed amendments passed by two-thirds of the executive committee (Bulletin No. 22).

It was imperative, however, that immediate action be taken to raise dues, something that even Stanfield had to recognize. Details are not available, but at the September 1948 meeting in Cincinnati, some sagacious person suggested that moving the specifications on dues to the bylaws would enable changes to be made as needed. The bylaws contained no provision for their amendment, and thus they fell under the general authority of the executive committee (exception: Section 9 on the Stephen Hales award could not be amended without unanimous approval of the executive committee, "and only after due notice of all changes shall have been published to the membership a full calendar year in advance of the changes"). In 1954, however, the matter of raising dues was referred to the members at the annual business meeting (70); but referral does not seem to have been made consistently.

Moving dues to the bylaws received the necessary unanimous approval and was voted on in the spring of 1949. Wadleigh reported (131): "The Constitutional Amendment providing that stipulations as to the amount of dues paid by a given member should be stricken from the Constitution and transferred to the by-laws was carried by a 10 to 1 margin." The new bylaw was added as Section 11. At the December 1949 executive committee meeting the dues for 1950 were raised to \$6.

Also at the 1949 meeting (53), the executive committee authorized a ballot on the doubling of the editorial board (Article IX). As mentioned earlier, this change was requested by Loehwing and was approved.

The report on the 1951 meeting (32) includes a note that the executive committee had approved a vote on a constitutional amendment establishing the board of trustees (Article IX-1, 3). (Discussed in some detail in this chapter under Money Matters.)

In preparation for publication of a new directory with constitution and bylaws, secretary Naylor pointed out in a September 5, 1954, agenda (132) to the executive committee that changing to early autumn meetings necessitated deleting dates based on December meetings. Thus, changes were required in Sections 9 and 10 which dealt with the Hales and Barnes awards and which Shull had laid out in detail. The changes were authorized (70). Also for the 1955 directory (Bulletin No.

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19), Section 8 was changed to read, "The term of all officers shall begin on January 1 and close on December 31."

There is a perplexing addition to the bylaws in Bulletin No. 19, 1955. Section 12, Sustaining Subscriptions, appears: "The rate for sustaining subscriptions to the official journal shall be \$300.00 per year for a period of ten years." Nothing has been found to indicate why this new bylaw was established, and nothing in the financial reports shows sustaining subscribers.

At the 1955 executive committee meeting in East Lansing (23), "Dr. Stanfield proposed, and it was approved, that the By-Laws be amended to read that the Life Membership be raised to \$150.00 and the Patron Fee to \$200.00. The new regulations are to take effect January 1, 1956."

At the 1958 meeting in Bloomington (79), emeritus membership was established as follows: "A member reaching age of retirement and who has been a member ten years or more may apply to be admitted to Emeritus membership. Such a member will not pay dues, will not receive the Journal, but will retain all other rights of membership." It is puzzling that the 1964 constitution and bylaws recognize emeritus membership as existing (Article III-1) but do not define it. At the same annual meeting it was voted that the representatives from the sections to the executive committee be members elected for staggered three-year terms. Again, however, these details are missing from the 1964 constitution and bylaws.

The Stephen Hales award was increased from \$100 to \$500 at the 1959 meeting in Montreal (81). The executive secretary-treasurer was instructed to pool the Hales and Barnes funds with regular Society funds and investments, but inspection of the financial reports shows this was not done—amendments to the constitution and bylaws would have been required.

The fact is that the constitution and bylaws were always a bit out of step with practices and procedures authorized by the executive committee and membership. In 1953 Broyer, who had been a conscientious secretary and who had just been elected president, compiled a list of the recent rulings and customs (133):

Standing Rules and Customs as of 1953

(In addition to Constitution and By-Laws)

1. The A.S.P.P. shall co-sponsor symposia under Section G programs of the A.A.A.S... (Exec. Com. Sept. 9, 1951).
2. Before elections to offices, the Secretary shall secure the consent of nominees for the office of Secretary before their names are placed on the election ballot. (Exec. Com. Sept. 9, 1951).
3. Symposium papers may be submitted for publication in Plant Physiology if the speakers are members of the Society. As of this date, the Monograph Board was considering publication of these papers. No decision rendered. (Ann. meeting, Sept. 11, 1951).
4. Resolved that the Executive Secretary-Treasurer be granted the authority to sell, assign, and transfer stocks, bonds, securities, etc. Resolved that each such transaction shall be submitted to the Board of Trustees and upon

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their approval a copy shall be countersigned by the Secretary. (Exec. Com. Sept. 7, 1952).

5. Abstracts are required on all submitted papers for our programs. (Exec. Com. Sept. 8, 1952).

6. Number of papers that any one author be allowed to present at the annual meetings to be left to the discretion of the Program Chairman. Maximum time of paper, 15 minutes each. (Ann. meeting, Sept. 9, 1952).

7. It has been customary, within the stipulation of Part J, Section 10 of the By-Laws, that the President call upon the Chairman of the Charles Reid Barnes Life Membership Committee, if present at the banquet, to announce the name of the award recipient, to read a biography, and introduce the individual if present, to those present. The recipient is not notified beforehand and may or may not be in attendance at the banquet.

No one followed up Broyer's initiative, which is a pity because it is evident that the officers and the executive committee could have used a ready reference to what they had enacted in their annual deliberations.

Awards

Table 15 lists the awards for this period. Making up this table revealed some discrepancies in the listing of corresponding members as given in the directories and as announced in *Plant Physiology*. The directories fail to list H. Lundegardh as elected to corresponding membership in 1950, whereas both the journal and correspondence show that he was. W. O. James is listed in the directories as elected in 1951, but correspondence shows he was elected in 1952. The directories list H. Tamiya as being elected in 1953, whereas the journal (4) lists N. Kamiya. Naylor's minutes of the 1953 meeting (134) list H. Tamiya as elected, and Naylor recalls this as correct (personal communication).

No reason is found for the failure to elect corresponding members after 1953. The constitution required that "no such election shall occur at any time when the total number of corresponding members shall exceed two percent of the current paid-up enrollment of the Society." In 1953 ASPP membership was about 1000, and the number of living corresponding members appears to have been 19. Presumably, the Society decided to wait for a significant growth in membership before electing more corresponding members. And then forgot (16 new members could have been elected by 1963).

The Barnes and Hales awards were made with only occasional glitches. As president, Galston had to deal with Borthwick's failure to receive his Hales award certificate and check, both of which had been mailed (135): "...it might be desirable for the Awards Certificates to be ready at the banquet, so the President could present them to the recipients, together with a check. This could all be handled by the Executive Secretary-Treasurer, so that continuity of practice could be assured." (It appears this procedure became standard, but it needed a discrete inquiry whether the

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Table 15

Barnes, Hales, Kettering^a, and Corresponding Membership Awards, 1945-1962

Year	Barnes	Hales	Corresponding
1945	D. R. Hoagland		
1946	E. C. Miller	B. E. Livingston	R. Bouillenne
1947	W. W. Garner		H. Burstrom
	H. A. Allard		R. Collander
			A. Frey-Wyssling
			F. G. Gregory
1948	H. H. Dixon	R. Emerson	
		D. R. Goddard	
1949	E. Kraus		
1950	J. W. Shive	B. Vennesland	H. Lundegardh
1951	W. H. Chandler		L. Brauner
			K. Hofler
			B. Huber
			W. Ruhland
			W. Stiles
1952	C. B. van Niel	L. R. Blinks	T. A. Bennet-Clark
			W. O. James
			J. S. Turner
1953	H. Lundegardh		R. Harder
			G. Melchers
			R. N. Robertson
			H. Tamiya
1954	A. E. Murneek	F. K. Skoog	
1955	W. F. Loehwing		
1956	H. P. Vickery	M. Calvin	
1957	W. E. Loomis		
1958	P. Boysen-Jensen	F. W. Went	
1959	F. G. Gustafson		
1960	H. A. Borthwick	P. R. Stout	
1961	F. P. Cullinan		
1962	A. S. Crafts	S. B. Hendricks	
		H. A. Borthwick	

^a The Kettering Award was established in 1962. The first recipient was R. Hill.

recipient planned to be present. As indicated in Broyer's list of rules and customs (133), the recipients were supposed to hear about their award for the first time at the banquet. The annual banquet was a major event and provided the atmosphere needed for happy formalities, such as announcing awards.)

Upon the death of R. B. Harvey in 1945, the Minnesota Section tried to establish a fund for a memorial award, but found that at most about \$500 could be raised in the state. R. H. Landon, acting for the section, appealed to the Society (136)

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for help, suggesting a broader campaign to raise the money: "...if anything is to come of the Harvey memorial the Society will have to get behind it. I realize that the Society cannot memorialize every good member but in Harvey's case he was the founder of the organization in conjunction with Dr. Shull." The act of founding, although recognized, raised little enthusiasm in the executive committee at the St. Louis meeting. Secretary Withrow wrote a long, tactful letter to Landon (137) explaining the situation:

After considerable discussion the general consensus of opinion was that such an award would be difficult to administer in view of the fact that a Stephen Hales award is already being administered by the Society. The view also was expressed...that such prize awards should be limited to honor non-contemporary physiologists.

A second proposal which was favorably considered by the Committee suggested that a research fund be set up which would make possible the granting of aid to research workers...Dr. Harvey had made industrial contacts and some of these might yield considerable sums...A principal of ten to twenty thousand dollars would make possible a grant of from two hundred and fifty dollars to five hundred dollars per year...

A third proposal was the establishment of a publication fund in the name of Dr. Harvey for the financing of special publications in the journal...

A fourth project might be that of establishing a few distinguished service memberships for retired members of the Society [who are sometimes] unable to retain their membership in the Society...

These are the suggestions as I have collected them. Unfortunately it would require a principal of at least ten thousand dollars...for any substantial form of award. There are two possible groups from which such a fund might be solicited. It might be obtained by soliciting the membership of the Society as a whole. The Executive Committee felt that [it could not justify] such a solicitation at the present time in view of the rising cost of living and the relatively static nature of professional incomes. In addition the costs of the Society are increasing and it may soon become necessary to increase dues. Therefore it would not be feasible to depend upon the membership of the Society as a whole for such a fund. Dr. Harvey had a great many friends both in the profession and in industry. Solicitation of these might yield the necessary income...

The long and short of it was that if the Minnesota group could come up with the money the Society would find an appropriate means of disbursing it in Harvey's name, though probably not as an equivalent of the Hales award. The proposal died. It is a puzzling fact that, aside from perfunctory praise of his effort in founding the Society, Harvey never received from his contemporaries the recognition one might have expected—the kind given Shull, in whose honor the Society later created an award out of its reserves. But then, in the initial fight, Shull was the general behind the lines; Harvey was the shock troop, opening them. Shull carried on in command; a shock troop was no longer needed.

The Society established a new award in 1961 "for especially meritorious

work in the area of photosynthesis or energy transfer in the photosynthetic process" with a grant from the Charles F. Kettering Foundation (87). The grant was for a \$1000 award each year, with a review of the commitment after five years, "but it is thought that it will continue indefinitely (87)." Oddly, for this Society, the award was not mentioned in the constitution and bylaws during this period. Robert Hill of Cambridge University, he of "Hill reaction" fame, was the first recipient.

Sections

The original sections of the Society were local organizations formed in 1926 on the Purdue University and University of Minnesota campuses. Section members discussed on-going campus research or interesting papers and listened to occasional off-campus speakers. The next sections to be formed, however, were regional, encompassing several states: New England (1933), Western (1935), and Southern (begun as Southeastern, 1939), holding annual meetings much in the fashion of the parent society. After the war petitions for two additional local sections were approved: Illinois (1948) (138) and Washington, D.C. (1951) (139). The Washington group, however, was much larger (116 members in 1959) and more comprehensive than the campus sections, including, as it did, universities and government agencies in the adjacent areas of Maryland and Virginia. Washington had organized meetings with symposiums, lectures, and paper sessions. In fact, the Washington Section was regional, but it seemed local because the region was conveniently small.

The campus sections had difficulty maintaining active programs. The Minnesota Section was dissolved in 1953 due to decreased activity (140). Strength lay in numbers. In general, participants in small discussion groups get to know one another too well, the meetings lose interest, and it is difficult to maintain committed leadership. Regional sections with their annual meetings and greater diversity had more to offer. In 1954 the Illinois Section inquired of president Broyer about forming a Midwestern Section along the lines of the Western Section. Broyer encouraged this move (140), provided the present local sections did not also have representation on the executive committee (the Illinois plan was to dissolve the locals). Broyer added, "There are definitely advantages to regional sections provided they through separate meetings would not weaken our regular annual meetings."

In June 1955 the Illinois Section held a well-attended invitational meeting at Urbana at which the Midwestern Section was organized. Society approval was given at the 1955 executive committee meeting in East Lansing (23), and the Illinois, Purdue, and Minnesota sections were disbanded.

At the same meeting (23) permission was given the New England Section to change its name to Northeastern Section to correspond more closely with the territory represented at meetings (the section added New York, New Jersey, and,

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later, Delaware, and eastern Pennsylvania). A committee consisting of Crafts, Borthwick, and Broyer was directed "to draw up a brochure on sectional organization." What they drew up was a one-page resume and discussion for "News and Notes" of *Plant Physiology* (141), one of the most rapid committee responses in the history of the Society. The committee quoted the constitutional provisions for forming sections (petition of 10 members, possession of local autonomy, and dissolution on failure to maintain 10 members). The group recognized the move toward regional sections (Washington area an exception) and commented on the sectional activities: the Southern Section had for some years been meeting successfully with the Association of Southern Agricultural Workers (ASAW); the Western Section held its annual meetings with the Pacific Division of AAAS, holding joint symposiums with the Botanical Society, the horticulturists, and sometimes the Western Society of Soil Science. The committee added:

All information and observation leads to the conclusion that section formation and active participation therein has been and can be of pleasure and benefit to our members. Meetings are held at times which do not conflict with or detract from our annual national meetings...These meetings serve those who cannot attend the national fall sessions under the A.I.B.S...

Members at large are urged to attend and participate actively in these sectional meetings and to invite and foster attendance by younger plant physiologists and others who as yet are not members of our Society [sections being autonomous could enroll people who were not members of ASPP].

They could have added that smaller meetings with neighboring institutions in non-conflicting sessions are more fun. In those cases where meetings could be mounted with the aid of a coordinating organization, the mechanics were easier and the science amplified. The Western Section, dominated by Californians, who worked jointly with botanists and agriculturists, was able to mount scientifically comprehensive meetings which were the equivalent of small national meetings. In this period the Southern Section held nearly all of its very successful meetings with the Association of Southern Agricultural Workers; indeed, the Section had an additional allegiance, and drew additional strength, as a member organization of ASAW (142).

At the end of this period, 1962, all sections were functioning well.

Committees and Representatives

In the history of any organization something should be noted about committees and representatives, the functioning bodies of all societies. In the writing to this point, the activities of the standing committees are evident in the activities of the Society. Some *ad hoc* committee reports are discussed. Not discussed, however, are the more or less bureaucratic trivia of other reports—bureaucratic in that inherent in societies is a need to satisfy regulations or problems or complaints

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(appoint a committee!) or to maintain working contacts with outside organizations, which are trivial because the work done on these matters often produces nothing of importance. At least this observation seems true from a distance. Bureaucratic work produces files that periodically have to be cleaned out, sometimes with the sacrifice of important materials.

At times the Society carried a large number of representatives and committees. The following list illustrates what appears to have been the peak level of involvement (the original document [143] lists individual committee members and representatives as well):

Committees and Representatives, ASPP, 1951-52

Executive Committee
 Editorial Board of *Plant Physiology*
 Monograph Board
 Finance Committee
 Program Committee
 Memorial Committee
 Committee on Stephen Hales Award
 Committee on Charles Reid Barnes Life Membership Award
 Committee on Chemical Methods
 Committee on Physical Methods
 Committee on Nomenclature of Plant Growth Substances
 Committee on Professional Status and Training
 Committee on Artificial Light on the Growth of Plants
 Committee on Aid in Preparation of a Handbook on Biological Data
 Committee on Publication of a Newsletter
 Committee on Relations between the Society and the Physiological Section of the Botanical Society of America
 Representative on the Council of the AAAS
 Representative to the National Research Council
 Representative to the Governing Board of AIBS
 Representative to the Editorial Board of the *American Journal of Botany*
 Representative on the Joint Committee on Grassland Farming

Of all the representatives, the one to the governing board of AIBS was probably the most important because annual meetings were held with AIBS at this time. Beyond the meetings, however, it is difficult to see where AIBS had much influence on Society affairs. In the larger sphere of biological science, AIBS (located in Washington, DC) must have provided the Society with a political voice, but it does not seem to have been a very loud one. And as a group (that is, individuals excepted) plant physiologists did not seem to have much to say. Of course, there was always the opinion that plant physiology deserved greater research funding, but since funding steadily increased during this period, there was no effective agitation in the Society for political action on this front. For most members, there was much more excitement over research developments than over anything political. The Society was useful in communicating science, whereas AIBS and AAAS operated in a sphere well removed from the laboratory.

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In retrospect, the science and its Society were enmeshed in a period of national growth, when things American dominated the world scene. A boom, we say, but that implies quantity; yet, there was rapid advancement in the qualitative aspects of plant physiology as well. A much more sophisticated level of research was emerging, which broadened the perspectives of the science. Survival of the Society was never in question, and the journal started on a slow but definite shift toward publishing science only.

References

1. Crafts, A. S. (April 1953). Letter to the executive committee on date of officers assuming office.
2. Shull, C. A. (May 14, 1953). Reply to Crafts on date of assuming office and other matters.
3. Brown, A. H. (May 12, 1953). Reply to Crafts on date of assuming office.
4. ASPP, Report of 1953 annual meeting, Madison, WI (1953). *Plant Physiology* 28: 759-761.
5. ASPP, Report of 1962 annual meeting, Corvallis, OR (1962). *Plant Physiology* 37: 841-844.
6. Withrow, R. B. (Oct. 24, 1945). Letter to executive committee, ASPP.
7. ASPP (Oct. 1, 1944). Constitution and Bylaws, Bulletin No. 15.
8. Withrow, R. B. (March 15, 1946). Letter to executive committee, ASPP.
9. ASPP (Jan. 1, 1947). Constitution and Bylaws, Bulletin No. 16.
10. Galston, A. W. (April 9, 1956). Letter to A. W. Naylor on nominations to office.
11. Stanfield, J. F. (Jan. 3, 1948). Letter to W. F. Loehwing about the journal.
12. Stanfield, J. F. (July 11, 1954). Letter to F. P. Cullinan on work of publishing the journal.
13. Stanfield, J. F. (undated, 1956?). Description of duties of executive secretary-treasurer.
14. Stanfield, J. F. (Oct. 9, 1956). Letter to A. W. Galston about work as executive secretary-treasurer.
15. Galston, A. W. (Oct. 16, 1956). Letter to F. Skoog transmitting copy of Stanfield's letter (ref. 14).
16. ASPP, Report of 1956 annual meeting, Storrs, CT (1957). *Plant Physiology* 32: 67-69.
17. Borthwick, H. A. (June 20, 1956). Letter to P. J. Kramer on compensation for certain Society officers.

History of the American Society of Plant Physiologists

18. ASPP, Report of 1947 annual meeting, Chicago, IL (1948). *Plant Physiology* 23: 165.
19. Kramer, P. J. (undated, 1947?). A report on the proposed American Institute of Biological Sciences.
20. Lee, M. O. (July 23, 1953). Letter to A. S. Crafts transmitting AIBS offer of business services.
21. Thimann, K. V. (Dec. 4, 1953). Letter to A. W. Naylor with comments on AIBS business service.
22. Thimann, K. V. (May 17, 1955). Letter to A. S. Crafts with comments on ASPP membership.
23. ASPP, Report of 1955 annual meeting, East Lansing, MI (1956). *Plant Physiology* 31: 82-84.
24. Bonner, J. (1950). The status of plant physiology in the United States: The number, interests, and rate of training of plant physiologists. *Plant Physiology* 25: 529-535.
25. Withrow, R. B. (Dec. 29, 1946). Secretary's report of executive committee meeting.
26. Loehwing, W. F. (Nov. 6, 1946). Personal letter to C. A. Shull.
27. Loehwing, W. F. (Nov. 3, 1948). Letter to J. F. Stanfield on meeting printing costs.
28. Stanfield, J. F. (Nov. 9, 1948). Reply to W. F. Loehwing (ref. 27).
29. Loehwing, W. F. (July 24, 1950). Analysis of printing options and costs for the executive committee and editorial board, ASPP.
30. Stanfield, J. F. (Sept. 13, 1950). Personal report to Loehwing on executive committee actions.
31. Loehwing, W. F. (Oct. 10, 1950). Reply to Stanfield on intentions with respect to printing.
32. ASPP, Report of 1952 annual meeting, Ithaca, NY (1952). *Plant Physiology* 27: 215-216.
33. Taylor, J. T. (Oct. 28, 1960). Transmittal of check from the Walter Thomas estate.
34. Noggle, G. R. (Aug. 24, 1960). Letter transmitting the executive secretary-treasurer's report to the executive committee.
35. Klein, W. H. (Aug. 26, 1962). Executive secretary-treasurer's annual report to the executive committee.
36. Thimann, K. V. (Oct. 19, 1956). Letter to A. W. Galston about J. F. Stanfield's attitude toward ASPP finances.
37. ASPP, Report of 1963 annual meeting, Amherst, MA (1963). *Plant Physiology* 38: 751-754.
38. Kramer, P. J. (Sept. 9, 1947). Letter to F. W. Went on finances.
39. ASPP (1955). Constitution and Bylaws, Bulletin 19, 1955.

History of the American Society of Plant Physiologists

40. Cunningham, W. (Aug. 24, 1951). Letter to J. F. Stanfield advising that creation of a board of trustees required no reincorporation.
41. Crafts, A. S. (Oct. 24, 1952). Letter to executive committee commenting on role of the board of trustees.
42. Stanfield, J. F. (June 25, 1953). Letter to A. S. Crafts on role of trustees.
43. Stanfield, J. F. (June 11, 1953). Letter to D. L. Arnon on role of trustees.
44. Arnon, D. I. (June 16, 1953). Reply to J. F. Stanfield (ref. 43).
45. Klein, W. H. (May 14, 1962). Letter to L. P. Miller on handling of ASPP investments.
46. Shull, C. A. (1953). Letter to A. S. Crafts on turning over the duties of the finance committee to the board of trustees. This letter has been mislaid.
47. Shull, C. A. (1926). Foreword. *Plant Physiology* 1: 1-2.
48. Loehwing, W. F. (Nov. 13, 1951). Letter to J. F. Stanfield on lack of copyright on the journal.
49. Muir, R. M. (1961). Walter Ferdinand Loehwing, 1896-1960. *Plant Physiology* 36: 126-127.
50. Muir, R. M. (Feb. 2, 1987). Letter to J. B. Hanson on experience as editorial assistant to W. F. Loehwing.
51. Wadleigh, C. H. (Sept. 17, 1947). Letter to executive committee announcing Loehwing's resignation as editor-in-chief of the journal.
52. Wadleigh, C. H. (Dec. 26, 1947). Report of 1947 executive committee meeting, Chicago IL.
53. ASPP, Report of 1949 annual meeting, New York, NY (1950). *Plant Physiology* 25: 359.
54. Loehwing, W. F. (May 13, 1952). Letter to M. W. Parker on effect of doubling the number of editorial board members.
55. Crafts, A. S. (Oct. 24, 1952). Letter to executive committee with news of Loehwing's resignation as editor-in-chief.
56. Arnon, D. I. (Feb. 24, 1953). Letter to executive committee with ballot to elect one of four candidates editor-in-chief.
57. Crafts, A. S. (March 10, 1953). Report of ballot committee to D. I. Arnon on election of editor-in-chief.
58. Arnon, D. I. (March 27, 1953). Letter to D. R. Goddard on terms of appointment as editor-in-chief.
59. Loehwing, W. F. (April 3, 1953). Letter to D. R. Goddard on editorial affairs.
60. Arnon, D. I. (May 19, 1953). Letter to A. S. Crafts on Goddard's conditional acceptance of the editorship.
61. Stanfield, J. F. (May 28, 1953). Letter to A. S. Crafts with comments on delayed journal publication.
62. Crafts, A. S. (May 9, 1955). Letter to executive committee announcing Goddard's intention to resign as editor.

History of the American Society of Plant Physiologists

63. Crafts, A. S. (June 6, 1955). Letter to A. W. Naylor with comments on Goddard's editorship.
64. Stanfield, J. F. (Jan. 13, 1956). Letter to H. A. Borthwick with comment on delayed issues of the journal.
65. Stanfield, J. F. (Nov. 30, 1955). Letter to A. W. Galston with comments on lateness of the journal.
66. Galston, A. W. (Dec. 6, 1955). Reply to Stanfield (ref. 65).
67. Galston, A. W. (Feb. 3, 1956). Letter to D. R. Goddard with comment on lateness of the journal.
68. Goddard, D. R. (Feb. 6, 1956). Reply to Galston (ref. 67).
69. Goddard, D. R. (Aug. 16, 1955). Letter to A. W. Naylor transmitting report for the annual meeting.
70. ASPP, Report of 1954 annual meeting, Gainesville, FL (1954). *Plant Physiology* 29: 540-541.
71. Broyer, T. C. (May 13, 1955). Letter to D. R. Goddard on publishing book reviews.
72. van Overbeek, J. (1954). Nomenclature of Chemical Plant Regulators. Report by a Committee of the American Society of Plant Physiologists. *Plant Physiology* 29: 307-308.
73. Larsen, P. (1954). Nomenclature of Chemical Plant Regulators. A Criticism. *Plant Physiology* 29: 400-401.
74. Naylor, A. W. (July 22, 1955). Letter to D. R. Goddard on publishing abstracts of contributed papers.
75. Goddard, D. R. (July 26, 1955). Reply to A. W. Naylor (ref. 74).
76. Brown, A. H. (1958). Letter to editorial board with questions for annual meeting of the board.
77. Brown, A. H. (Aug. 3, 1960). Letter to editorial board on printing and citing abstracts.
78. Galston, A. W. (Sept. 19, 1956). Secretary's minutes of the 1956 executive committee meeting, Storrs, CT.
79. ASPP, Report of 1958 annual meeting, Bloomington, IN (1959). *Plant Physiology* 34: 90-93.
80. Brown, A. H. (Sept. 1958). Letter to Science Press on publication schedule.
81. ASPP, Report of 1959 annual meeting, Montreal, Canada (1960). *Plant Physiology* 35: 147-150.
82. ASPP, Report of 1960 annual meeting, Stillwater, OK (1961). *Plant Physiology* 36: 121-124.
83. ASPP, Report of 1961 annual meeting, Lafayette, IN (1961). *Plant Physiology* 36: 847-850.
84. Brown, A. H. (Jan. 22, 1962). Letter to H. Beevers about Naylor's failure to appoint a committee to find a new editor-in-chief.

History of the American Society of Plant Physiologists

85. Beevers, H. (undated, 1962). Letter to the editorial board requesting vote on candidates for editor-in-chief.
86. Brown, A. H. (Feb. 12, 1962). Letter to H. Beevers on candidates for editor-in-chief.
87. Gibbs, M. (March 26, 1962). Letter to H. Beevers with questions about editorship of the journal.
88. ASPP, Report of 1964 annual meeting, Boulder, CO (1964). *Plant Physiology* 39: 1061-1065.
- 88a. Laties, G. G. (1963). Ballot on constitutional amendments.
89. Johnston, E. S. (Feb. 6, 1945). Letter to W. E. Loomis announcing his election to editor-in-chief of the monographs.
90. Kramer, P. J. (Aug. 15, 1945). Letter to the executive committee listing matters to be dealt with.
91. Loomis, W. E. (July 13, 1945). Letter to P. J. Kramer discussing monographs.
92. ASPP. (1949). Announcement of "Photosynthesis in Plants." *Plant Physiology* 24: 333.
93. ASPP. (1953). Announcement of "Growth and Differentiation in Plants." *Plant Physiology* 28: 762.
94. Loomis, W. E. (Aug. 16, 1954). Letter to members of the monograph committee about the future of the monograph series.
95. Naylor, A. W. (Nov. 5, 1953). Letter transmitting minutes of the 1953 meeting at Madison, WI, to the executive committee.
96. Steward, F. C. (May 8, 1954). Letter to A. W. Naylor about the Society's monographs.
97. Crafts, A. S. (July 29, 1952). Letter to W. H. Bragonier on requests for occupational information.
98. Stanfield, J. F. (Jan. 3, 1954). Letter to J. Bonner on the vocational brochure.
99. Bonner, J. (1954). "Plant Physiology as a Career." A vocational guidance bulletin issued by ASPP.
100. ASPP, Report of 1957 annual meeting, Stanford, CA (1958). *Plant Physiology* 33: 74-77.
101. Galston, A. W. (1959). "Plant Physiology as a Career." A revision of the vocational guidance bulletin (ref. 99).
102. ASPP. (1958). Directory of Members. Bulletin No. 20.
103. ASPP, Report of 1946 annual meeting, St. Louis, MO (1946). *Plant Physiology* 21: 241-242.
104. Loehwing, W. F. (April 10, 1946). Letter to R. B. Withrow about St. Louis meeting.
105. Skoog, F. (June 29, 1953). Letter to A. S. Crafts on annual business meetings.

History of the American Society of Plant Physiologists

106. Crafts, A. S. (July 7, 1953). Reply to F. Skoog (ref. 105).
107. Broyer, T. C. (Jan. 5, 1951). Letter to K. V. Thimann on presidential appointments.
108. ASPP, Report of 1950 annual meeting, Columbus, OH (1951). *Plant Physiology* 26: 198-199.
109. Meyer, B. S. (1952). Report of Committee on Relations between the American Society of Plant Physiologists and the Physiological Section of the Botanical Society of America.
110. Meyer, B. S. (Aug. 3, 1953). Letter to A. S. Crafts requesting discharge of committee (ref. 109).
111. Kramer, P. J. (May 2, 1952). Letter to A. S. Crafts commenting on relations with the Physiological Section of BSA.
112. Withrow, R. B. (July 9, 1946). Letter to H. A. Meyerhof on meetings sponsored by AAAS.
113. ASPP, Report on 1946 annual meeting, Boston, MA (1947). *Plant Physiology* 22: 201.
114. ASPP. (1946). Agenda for 1946 executive committee meeting.
115. Wadleigh, C. H. (Dec. 29, 1947). Secretary's report of annual business meeting, Chicago, IL.
116. Wadleigh, C. H. (Nov. 7, 1947). Letter to executive committee on AAAS refusal to sponsor 1948 meetings.
117. ASPP, Report on 1948 annual meeting, Cincinnati, OH (1949). *Plant Physiology* 24: 182-183.
118. Wadleigh, C. H. (April 20, 1948). Letter to executive committee on planning 1949 meeting.
119. Wadleigh, C. H. (March 4, 1949). Letter to executive committee on requirements for the New York meeting.
120. Wadleigh, C. H. (May 6, 1949). Request for executive committee to vote on projection for New York meeting.
121. Broyer, T. C. (May 11, 1949). Letter to C. H. Wadleigh protesting union regulation of ASPP meeting in New York.
122. Wadleigh, C. H. (May 16, 1949). Reply to T. C. Broyer (ref. 121).
123. Wadleigh, C. H. (June 3, 1949). Letter to executive committee with decision on New York meeting, and other matters.
124. Stanfield, J. F. (Jan. 29, 1955). Letter to A. W. Naylor on resolution passed at 1954 annual business meeting.
125. Stanfield, J. F. (Oct. 19, 1954). Letter to D. W. Bronk protesting resolution passed at 1954 annual business meeting.
126. Steward, F. C. (Sept. 30, 1955). Letter to A. W. Naylor about abstracts of papers not delivered.
127. Wadleigh, C. H. (Nov. 12, 1948). Letter to Loehwing about journal for corresponding members.

History of the American Society of Plant Physiologists

128. Wadleigh, C. H. (Feb. 5, 1948). Letter to executive committee on proposed constitutional amendments.
129. Wadleigh, C. H. (June 14, 1948). Letter to executive meeting on the results of their voting.
130. Leonard, O. A. (April 20, 1948). Letter to C. H. Wadleigh retracting negative vote (ref. 129).
131. Wadleigh, C. H. (June 23, 1949). Report to executive committee on results of annual ballot.
132. Naylor, A. W. (Sept. 5, 1954). Agenda for executive committee meeting, Gainesville, FL, with comments on needed bylaw changes.
133. Broyer, T. C. (1953). "Standing Rules and Customs as of 1953." Mimeographed for distribution to officers and executive committee.
134. Naylor, A. W. (Sept. 6-7, 1953). Minutes of executive committee meeting, Madison, WI.
135. Galston, A. W. (Jan. 18, 1963). Letter to H. Beevers on failure of Hales award to be delivered to H. A. Borthwick.
136. Landon, R. H. (June 26, 1946). Inquiry of P. J. Kramer on proposal to create a R. B. Harvey award.
137. Withrow, R. B. (July 9, 1946). Letter to R. H. Landon on executive committee discussion of the proposed Harvey award.
138. McAlister, D. F. (May 19, 1948). Letter to C. H. Wadleigh transmitting petition for creation of an Illinois Section of ASPP.
139. Borthwick, H. A. (Aug. 10, 1951). Correspondence with A. S. Crafts on establishing a Washington, DC, Section of ASPP.
140. Broyer, T. C. (June 8, 1954). Letter to J. B. Hanson on establishing a Midwestern Section of ASPP.
141. Crafts, A. S. (1956). Committee report on establishing sections of ASPP. *Plant Physiology* 31: 258.
142. Southern Section of ASPP (1952). Historical Statement 1940-1952. Typescript, author not given.
143. ASPP. (1951). Mimeographed list of officers, committees, and representatives.