

# Chapter Four

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## *Translating Industry, Transforming Science: Making a Transition in Virginia, 1963–1976*

From 1963 to 1976, science “took off” in Virginia, as the business community slowly gained an awareness of the valuable contributions made to industry by organized scientists. Often assuming center stage in research and development, Virginia scientists rose in stature, both professionally and socially. Increasingly, scientists were called in to lend their expert knowledge, offering various explanations for events as well as providing mechanisms by which social groups — especially political — could accomplish objectives they viewed as necessary. At first, the Virginia Academy of Science benefited from the new role of scientists, achieving a fairly strong position in many of the webs of negotiations defining the course of Virginia science. Most notably, the Academy was able to translate political interest in research and development into political interest in science education. This initial success did not last, however, in large part due to the inability of the VAS to continue to position itself in terms of the changing context of scientific professionalism.

### *Setting the Stage: Virginia, 1963–1976*

By the mid-sixties, Virginia at last could breathe a small sigh of relief. Massive Resistance — which many Virginia historians cite as the most crucial, shaping event of the century in the Commonwealth — by and large had come to an end, and the Old Dominion had begun the slow journey away from the evil of racism towards a more moderate social and political order. The Civil Rights Movement rendered more power to the state’s African-American population, and the “new” black vote changed the tenor of campaigning and elections for good.<sup>1</sup> With

the death of Harry Flood Byrd in 1966 came the decline of his organization, making way for a new tradition in which the ideals of “prosperity and respectability” reigned supreme.<sup>2</sup> The election of Republican Governor Linwood Holton in 1970 halted nearly a century of rule by the Democrats and, for the first time since Reconstruction, the potential for a genuine two-party system emerged in the state. It was, perhaps, no accident that the emergence of the Republicans came at a time when new attitudes toward prosperity through business were sweeping the Commonwealth. Partly as a result of this prosperity and partly as a cause, a large number of people moved to Virginia.

Virginia’s population rose from 3,996,949 in 1960 to 4,648,494 in 1970 to approximately one-half million more in 1975.<sup>3</sup> Accompanying this phenomenal growth in population was an enormous leap in industrial capacity. From 1962 to 1966 alone, more than a billion dollars was invested in Virginia by private companies, both in new and expanded plants.<sup>4</sup> The following decade, the amount more than doubled, as a program of economic expansion and urban renewal became a gubernatorial priority. It is quite clear that Virginia was able to attract the new companies and business investments as a consequence of the weakening not only of the Byrd machine but also the decline of the philosophy that gave primacy to rural interests. The urban areas, once viewed as a source of sin and left-wing persuasion, now became centers of development that not only brought people into the Commonwealth but also political power. In particular, the geographic area that would in the 1980s become known as the urban crescent — stretching from Northern Virginia through Richmond to Hampton Roads and over to Norfolk and Virginia Beach — gained population that would eventually translate into the election of new Democrats of liberal persuasion. The businesses and urban centers also were characterized by an interest in the educational institutions that supported the rapid industrialization of their areas: in the business schools, in the sciences and the technologies that were important to their endeavors.<sup>5</sup>

Rapid industrialization often translates into an equally quick depletion and pollution of natural resources; by the early 1970s, Virginia’s governors, reluctant though they may have been, were beginning to see that ahead of them lay the difficult job of implementing conservation legislation without scaring off businesses. Conservation had never been a Virginia priority, however, despite the efforts of the academic scientific community. Furthermore, booming business meant rising in-

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comes for many, making Virginia's politicians leery of introducing too many environmental regulations. As a consequence, conservation efforts were minimal until 1974, when the almost accidental discovery that Life Science sProducts, Inc. of Hopewell, a spin-off of Allied Chemical, had been dumping tons of the polychlorinated hydrocarbon Kepone into the James unveiled the most severe ecological drama in Virginia's history. This event was to mark the second term of Mills Godwin in a manner that neither he nor his predecessors could have foreseen.

Among those predecessors was a native of Brunswick County, the calm and collected Albertis S. Harrison. Harrison could count among his forebears a signer of the Declaration of Independence and two Presidents of the United States, placing him squarely in the traditional mold of Virginia leaders. While his family was by no means affluent — his father a farmer, his mother a school teacher — they did make every effort to ensure their son's eventual attendance at University of Virginia's School of Law. The legal training served the dedicated Democrat well. After sixteen years of public service — save for time taken out for the military — as his county's Commonwealth Attorney, followed by ten years in the state senate, and four years as Attorney General, Harrison's gubernatorial victory in 1962 came as little surprise. Although steeped in the Byrd philosophy, Governor Harrison moved beyond such rigid and often repressive politics, making the leap from the conservatism and reactionism of the fifties to the more moderate and progressive sixties. "If I were to fix one goal for Virginia during the final decades of this century," he said in his inaugural speech, "it would be the expansion of the minds of our people within the tradition of Virginia character."<sup>6</sup> Guided by these "politics of transition," the state made steady, though not by any means remarkable, progress during Harrison's administration. His low-key manner did much to soothe the ever-present racial tensions, notably in addressing the problems of school integration. Most important, Governor Harrison was able, as Virginius Dabney commented, to "bring the Commonwealth to the threshold of far-reaching advances in education and industrialization. . . . set[ting] the stage for the moderate administrations of Mills Godwin and Linwood Holton."<sup>7</sup>

A close personal friend of Harrison, Governor Mills E. Godwin Jr., remains the only man twice-elected to Virginia's highest post. Elected first as a Democrat in 1966 and second as a Republican in 1974, the native southsider shared with the popular Governor Colgate Darden a

significant gift: the ability to move smoothly between the most conservative and the most liberal camps. During his first race, for example, Godwin enjoyed the backing of not only the Byrd organization but also Virginia's AFL-CIO and black leaders. A one-time architect of Massive Resistance, Godwin, by his administration's policies, marked the end of the Byrd organization as a dominant factor in Virginia politics. It is fittingly symbolic, therefore, that during Godwin's first year in office, Harry Flood Byrd died. Byrd, although in youth a forward-looking man who appeared to promise progressive policies, with the passage of years had become not only extraordinarily powerful but also exceptionally right-wing, in both his social and his fiscal policies. Looking back, it is clear that when Mills Godwin moved to the gubernatorial mansion, he brought Virginia's future with him.

Throughout both of his terms, 1966–1970 and 1974–78, Mills E. Godwin strove to move Virginia into a position of leadership among the states through emphasizing economic expansion, improvement of state services, and urban renewal.<sup>8</sup> While his first administration focused on resurrecting the Constitution of 1902 — two major tenets of which increased the chief executive's ability to direct the state agencies and explicitly guaranteed every child the right to a quality public education — Godwin's second four years were characterized by the constant struggle between maintaining and encouraging urban and industrial development while protecting natural resources and the environment. Godwin's first term was considerably more tranquil, therefore, than his second, but his reputation as a statesman and leader of vision survived the second term intact.

Between the two Godwin terms, A. Linwood Holton — who had run against Godwin in the 1966 primary — was elected as the first Republican Governor of the twentieth century.<sup>9</sup> A native of Southwest Virginia, Governor Holton valiantly attempted to prove that public service can come before partisanship. Among his achievements may be numbered a commitment to protecting the environment — one that continued to endure throughout the long years of quiet and low-ranking public service that followed his term — and the creation of the Old Dominion's first gubernatorial cabinet. Yet perhaps more than anything else, Governor Holton's belief in racial harmony, a belief that probably resulted from his origins in the southwest where African Americans numbered fewer than ten percent in any county, marked his time in office.<sup>10</sup> Laying the ground rules for his administration, Holton's first

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executive order read: "I will not tolerate nor will any state official tolerate racial or ethnic prejudice in the hiring or promotion of state employees."<sup>11</sup> In a state that remained torn by racial passions, Holton's example was a remarkable one, for he meant exactly what the Executive Order laid out. Holton practiced what he preached in his personal life as well; nationwide, the governor is remembered for escorting his thirteen-year-old daughter to a predominantly black Richmond public school during his first year in the state's capitol. By the end of Holton's tenure, black employment had risen twenty-five percent. His inability to remain a major player on the Virginia political scene has been attributed to a naiveté about the realities of party politics. Yet Holton had governed well and followed a vision that few could fault.

These twelve years changed the type of society that Virginia was to one that was more like the rest of America. The rise of the Republican party meant a scramble for re-alignment among politicians and voters alike. New so-called liberals became a force within the Democratic party, and they created a situation where black votes both counted and were courted and where environmental concerns became important. The once-moribund Republican party — indeed at one time the outcast across the board in the old Confederate states — now attracted the new conservatives. Pro-business, wary of racial preferences, uninterested in the African-American voters, the Republican party increasingly offered a safe haven for those conservatives to whom some of the policies of Byrd and of the old Virginia remained attractive. The national uproar that took place over the war in Vietnam, while it has little place in a discussion of the VAS, did affect the political scene in Virginia because highly traditional Virginians who put considerable stock in public order and mannerly discourse moved toward Republicanism as they were repelled by the images projected by the national Democratic party. In that sense, there is tremendous and instructive irony in the role played by Holton in revitalizing a party soon to turn into one in which he probably did not belong, and in the actions that Godwin was forced to take on behalf of the environment in the Kepone debacle.

#### *Sections, Committees, and Related Events*

For the Virginia Academy of Science, 1963 and 1964 marked the inevitable beginning of the passing of the "Old Guard." The membership had hardly recovered from the deaths of Allan T. Gwathmey and

Sidney S. Negus in 1963,<sup>12</sup> when, less than one year later, in early 1964, Ivey F. Lewis, "founder" of the Academy, died.<sup>13</sup> To honor Lewis's contributions, the Awards Committee unanimously recommended that the Distinguished Service Award be renamed the Ivey F. Lewis Service Award.<sup>14</sup> And, with help from a monetary gift left to the Virginia Academy by Sidney Negus, Council was able to honor his dedicated service by establishing in 1965 the annual Sidney S. Negus Memorial Lecture. The vitality and the dedication of these important men to the Virginia Academy of Science is unquestioned.<sup>15</sup>

Indeed, in 1973, the Virginia Academy of Science celebrated its fiftieth anniversary at the University of Virginia, reminiscing over the organization's history over the fifty years since scientists and science educators had gathered to listen to Ivey Lewis define the scope and function of their new Academy.<sup>16</sup> Celebration was also in order three years later, when the Virginia Academy of Science joined the nation in honoring the country's bicentennial. Chaired by Dorothy Bliss of Randolph-Macon Woman's College, the Virginia Academy's Ad Hoc Committee on the Bicentennial organized several commemorative activities: three invitational papers delivered at the Annual Meeting, "The Development of Technology and Industry in Virginia," "The History of Biological Sciences in Virginia," and the "History of Physical Sciences in Virginia"; a competition among secondary school students for the best research paper on an historical figure in Virginia science; and a special Wednesday evening program during the annual meeting treating colonial science.<sup>17</sup>

By 1973, three additional sections had joined the already existing twelve, providing the membership of the Virginia Academy of Science with ample opportunity for professional presentations. Materials Science and Space Science, both spin-offs of the original Astronomy, Mathematics, and Physics Section, presented full programs at the 1966 annual meeting in Harrisonburg.<sup>18</sup> The immediate response to the new sections was positive: in their first three years, the two averaged twenty-one and twenty-three papers per year respectively. Throughout the sixties and into the seventies, however, attendance at many of the older, more established sections, slowly declined — a phenomenon that did not go unnoticed by Council. Concerned over this trend, in late September of 1965, President Roscoe Hughes challenged Council and section leaders to direct their attention to creating a "challenging and interesting scientific program at the annual meeting where the Academy

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is, so to speak, exhibiting its wares.”<sup>19</sup> It is fruitful to consider where, exactly, the problem lay. Was this a result of the increasing specialization taking place in the world of science? Or was it a slow disengagement on the part of aging leadership in the older sections?

Despite the problems of lackluster attendance at the established sections, Council continued to receive requests for new sections. Not all attempts at starting a section, however, were successful. At the 1966 meeting, S. L. Emory, representing the geographers of Virginia, asked Council to reconsider establishment of a Geography Section. Although Council encouraged Emory to proceed with his organizational efforts in “accordance with the regulations of the VAS,” the geographer did not choose to take the matter any further.<sup>20</sup> While analysis of the archival evidence does not reveal the reason behind Emory’s failure to persist, one might speculate that he did not have the necessary backing from the state’s geography community. Such was not the case with the botanists, however. On October 25, 1970, at the Council meeting, Stewart Ware of William and Mary proposed a Botany Section, and Council agreed that at the May annual meeting, a Botany Section might attempt a trial run.<sup>21</sup> On the basis of excellent participation, the following year Botany was approved as a new section, with Stewart Ware as its first chair and Leonard Morrow as its first Council representative. Over its first three years, the section averaged twenty-five papers annually.<sup>22</sup>

#### *Membership*

Regardless of total attendance at the Annual Meetings, membership numbers as a whole remained strong during the second half of the sixties and the first half of the seventies, with a gradual growth from approximately 1110 — interrupted by some fluctuations — to roughly 1800. Nevertheless, Council continued to focus on retaining existing members and attracting new ones to the Virginia Academy of Science. And, by the mid-1960s, quite a few active members had conceded that to maintain a high-quality of organization, an “overhaul” of the “system” was in order. In a letter to Academy President Sam Obenshain, President-elect Hughes presented the following six “random” suggestions by which Council could “possibly upgrade the Virginia Academy of Science”: develop the means to have one or two associate editors in training; consider a more attractive format for the *Journal*; attract better research papers covering a wider range of fields; seek more advertis-

ing of "good taste"; consider compensating a business manager; and ensure that the VAS "should be the voice of science in Virginia."<sup>23</sup> With the advantage of hindsight, it is clear that Hughes' intuitive grasp of the potential for erosion was correct. While Hughes' recommendations were not acted upon officially, over the next few years Council gradually incorporated them in some form into the functioning Virginia Academy.

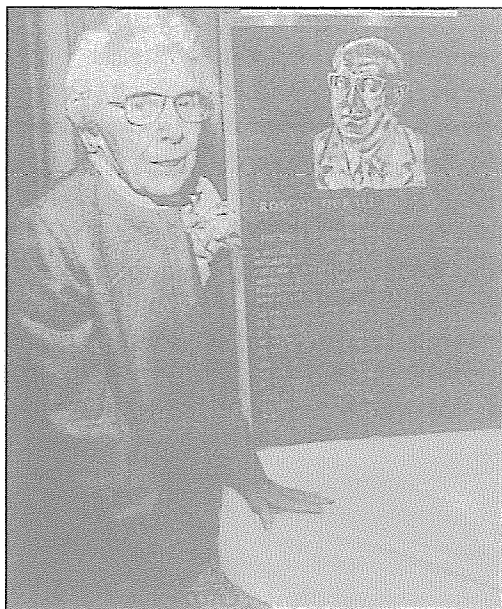
Despite all of these efforts, five years later, in 1970, section attendance remained low, with an ever-decreasing involvement and participation by the senior scientists in the Virginia Academy of Science threatening to damage the membership base of the organization. Within Council, there was an overwhelming sentiment that the seniors "have an obligation to share with and encourage younger scientific people," and the extent to which they actively were fulfilling that duty was a point of contention.<sup>24</sup> Other than advising the senior scientists of their responsibilities as older members of the scientific community, Council did not have other means to encourage participation. Unfortunately, the problem worsened as growing numbers of top-notch scientists in the state failed to show any interest in the Virginia Academy. By 1974, past-president Franklin Flint had grown sufficiently worried about the "brain-drain," that he wrote to chair of the Long Range Planning Committee, Dale Ulrich of Bridgewater College:

It seems to me that the Long Range Planning Committee needs to turn its attention to concern for the involvement in the Academy of prestigious scientists of the state. As the Academy involves increasing numbers of lower level science teachers, it runs the risk of becoming a less prestigious scientific organization and of having increased difficulty in attracting the devotion of prestigious scientists.<sup>25</sup>

Over the following year, the Long Range Planning Committee recommended to Council that it would benefit both the prestige of the Academy and science in the state for the VAS to begin sponsoring "respectable scientific activities and conferences" within the Commonwealth.<sup>26</sup> One wonders how the Long Range Committee defined "respectable scientific activity." Certainly, the Virginia Academy of Science had long encouraged and tried to engage in scientific activities of the highest caliber; indeed, one need only consider its efforts with the Science Museum of Virginia, the Virginia Institute for Scientific Research,



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*Mrs. Elizabeth Hughes, with a plaque bearing the likeness of her husband, Roscoe Hughes, chairman of biology and genetics at the Medical College of Virginia. Hughes was a vital advocate of the VAS, especially during its middle years; he served as president in 1967– 1968 and, in 1970, received the Ivey F. Lewis Distinguished Service Award and was selected a Fellow.*

and the American Association for the Advancement of Science. Furthermore, conferences and symposia held at the annual meeting — the most recent treating various aspects of the quality of the environment — were well-attended and often led by upper-level government officials and “prestigious” scientists, the latter from both academia and industry. The Virginia Academy of Science had worked hard at extending and strengthening its network, both within and without the scientific community, and, in fact, its attention to industry and to government reflected the VAS’s awareness of the changes taking place in the Commonwealth as a whole. Erosion of the membership base, which was just a minor problem in the late sixties, had begun to gather force in the mid-seventies. Efforts from within the VAS, however, were simply not effective. Taking the viewpoint of many members of the Virginia Academy, member Arthur Burke explained, “the most regrettable situation is that many college presidents look at the Virginia Academy of Science and sniff and say, so what?” Burke reported that he was a third party to a conversation in which a dean of a College of Arts and Sciences was asked by the president of a major Virginia company why he did not, as dean of a large college, encourage his faculty to join the Virginia Academy of Science. The Dean replied: “I don’t regard it as

being of enough significance to their careers and I regard it beneath my dignity to do it."<sup>27</sup> In very large measure, it appears that while the VAS's presence in public service endeavors, such as initiating the SMV and the VISR was apparent and accorded proper recognition, the organization's role in contributing to the professional lives of Virginia scientists was no longer seen as integral by the scientists and their institutional administrators.

Given the exodus of Virginia's senior scientists from the Academy's activities and the consequent efforts of the VAS to halt such movement during the late sixties and early seventies, it is not surprising that in 1968, Council approved a new category of membership. Article 4 in the Academy Constitution now read:

From active membership, there shall be a body of Scholars known as "Fellows of the Virginia Academy of Science," selected because of their contributions to science in one or more of the following ways: a) outstanding scientific research; b) inspirational teaching of science; c) highly significant leadership in the Academy.<sup>28</sup>

In mid-March, 1970, Council approved the first class of elected Fellows: Jesse W. Beams, John C. Forbes, Thomas E. Gilmer, Boyd Harshbarger, Roscoe D. Hughes, Clyde Y. Kramer, J. Douglas Reid, and William T. Sanger.<sup>29</sup>

Given the changing ideas of professionalism in science and of the pressure in the direction both of funded research and of publication in peer-reviewed journals that were taking place all across the United States, it seems very likely that it was nothing that the VAS did or failed to do that led to the decline in senior members. Arthur Burke's comment reinforces this position. There was no reward at all for first-class scientists or for those with significant ambition to participate in state-level scientific activities. Further, the professional niche that the VAS had represented had been taken over by national organizations, and increasingly state colleges and universities put membership in such national organizations into standards for promotion and tenure. Finally, the *Virginia Journal of Science*, which had struggled from its inception, remained a completely regional journal. Publication in the *Journal* would not go far in either fulfilling the needs of probationary faculty or of tenured faculty for validation of their work. In fact, this situation was not unique to the VAS. Other states' academies of science were under-

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going much the same pressures.<sup>30</sup> Forward-looking leaders were bound to recognize the seriousness of the dilemma that they faced.

#### *Long Range Planning Committee*

As it had in the past, the Long Range Planning Committee continued to play the role of a subtle, yet forceful and influential, strategist. For example, in 1968 when William Hinton, the outgoing chair, delivered his last report to Council, he proposed four questions the Virginia Academy of Science might ask itself in thinking ahead to a prosperous future. First, how could the Academy best assist in directing people with high quality potential to the scientific professions? Second, in what ways could the VAS further assist with the education of teachers, students, and the lay public? Third, how might the Virginia Academy strengthen support throughout the state for carrying out scientific activities? And fourth, how might the VAS accomplish its objective while working harmoniously and productively with the state and federal governments?<sup>31</sup> Over the next four years, Hinton's provocative questions served as a basis for many projects of the Virginia Academy of Science. In view of the VAS's previous efforts to tie together a viable network of individuals, companies, and government agencies, it is significant to observe that at least at some level, Hinton and others were aware that it was, at best, a tenuous network. And it was one in which the VAS had little power.

#### *Publications Committee*

Towards the end of 1965, it became apparent to Council that with the growing number of publications issued annually by the Virginia Academy of Science, an "oversight," or Publications Committee might be a good idea. Embracing the idea, then-President Roscoe Hughes directed Walter Flory to chair an Ad Hoc Committee on Academy Publications.<sup>32</sup> Over the next decade, this committee would substantially influence the course of all Virginia Academy publications, but especially that of the *Virginia Journal of Science* and the Dismal Swamp project.

#### *Virginia Journal of Science*

By 1964, the hard work of Editor Paul Siegel over two years had begun to take effect. For the first time since Boyd Harshbarger led the

publication, the *Virginia Journal of Science* left the press in a timely fashion. In October, Siegel reported that the last volume was, in fact, thirty percent larger than its 1963 counterpart, and he anticipated that the 1965 edition would boast a fifteen percent increase.<sup>33</sup> Constantly thinking ahead to ways of improving the quality of the *Journal*, in late 1965, Siegel announced in the *Journal* that effective with the issue of January 1966, a new "Letters to the Editor" section would be printed in an "effort to stimulate thought and discussion on pertinent subjects."<sup>34</sup> In May 1966, Siegel resigned as editor of the *Journal*. He had served as editor since 1961 — in addition to Harshbarger, only Siegel had completed his term of five years.<sup>35</sup>

Over the summer of 1966, the new Publications Committee recommended Herbert McKennis, Jr., of the Medical College of Virginia, as the new editor. Council approved the recommendation, and by January 1967, the *Journal* was issued under McKennis's name. The new editor assumed his position during a time of change. Rapidly increasing costs of printing and issuance mandated a substantial cut in the detail of the published reports of the Virginia Academy of Science's yearly activities. To save money, the "Program" of the annual meeting was published separately beginning in 1966; however, abstracts continued to appear in the fall issue of the *Journal*. Despite the different layout, during his two-year leadership McKennis managed to lead the *Journal* forward, introducing a new format using high-quality paper, maintaining subscription levels, and keeping the publication "out of the red." As Academy Fellow Arthur Burke remembered McKennis's time as editor:

Herb McKennis felt that the *Journal*, and he was adamant, should be a presentable piece, but that its real mission was to provide space to publish graduate articles, favored student articles, or things from minor persons that would not get published in national journals."<sup>36</sup>

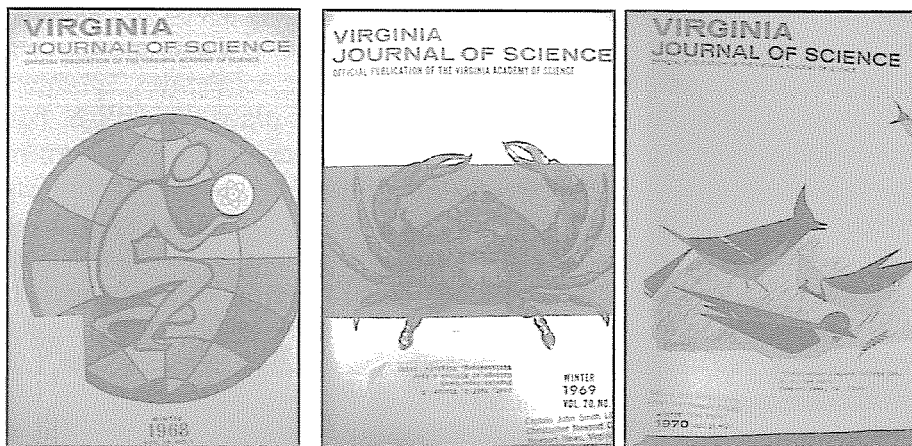
In view of the problems arising from the *Journal's* lack of prestige, one is forced to question the impact of this "adamant" policy, but it was to remain in effect for some time, with predictable results — helping aspiring, especially younger, scientists but not gaining a reputation as a serious professional journal.

In 1969, Lynn Abbott, Jr., a biochemist at the University of Richmond, succeeded McKennis. During his three-year editorship, Abbott continued to work with the new format introduced by McKennis and

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maintain subscription levels. “It was a hard job,” Abbott recently commented. “I think I spent more time on that than I did on any other thing I did in the Academy. Trying to get people to turn their manuscripts in....It was hard to get people to review them. I reviewed them myself.”<sup>37</sup> One of the unique accomplishments of Abbott’s tenure was the series of *Journal* covers he commissioned from Richmond artist Doug Hensley. When Walter Flory reported at the annual meeting in 1971 to Council that Lynn Abbott’s term would expire in August — and, most unfortunately, other commitments precluded his reappointment — the leaders of the VAS turned to the Publications Committee for counsel as to who might best fill the editor’s shoes. The Committee recommended Charles H. O’Neal, biophysicist of Virginia Commonwealth University, Health Science Division, and starting in September of 1972, O’Neal began his term.

Unfortunately for O’Neal, his entry into the “realm of the *Journal*” coincided with a downward turn, as manuscript submissions decreased, and timely publication became increasingly difficult. In 1973, Perry Holt of Virginia Polytechnic and chair of the Publications Committee, submitted an editorial to the *Journal*, in which he begged the entire membership to support the publication, especially senior scientists, who, he declared, “must be encouraged — urged — to publish more frequently



Commissioned from Richmond artist Doug Hensley by Virginia Journal of Science editor Lynn Abbott, Jr., a biochemist at the University of Richmond, these bright and colorful covers of excellent design quality brought a new sense of style to the *Journal*.<sup>38</sup>

some of their best work in the *Journal*." It is no secret, stated Holt, that "senior scientists" seek out national journals as vehicles for promoting their research and enhancing their reputations "nationally and internationally." Furthermore, it is equally known that "the administrative officers of at least some of the institutions of higher education in the state have actively discouraged their staff from publishing in the *Journal*." Determined to prove that the *Virginia Journal of Science* was an important publication with value to the wider scientific community, Holt pointed out that his articles in the *Journal* "have been as widely cited as those published in national or international journals." While Holt's plea should have nudged a few senior scientists into the direction of the publication, in actuality, it did nothing to change their publication preference from national to regional. Before the end of his term, on March 16, 1974, O'Neal, citing professional obligations, although frustration was the more likely cause, stepped down. The Publications Committee moved that David West of Virginia Polytechnic Institute and State University be named to fill the remaining portion of the unexpired term of office as *Journal* editor.

Hoping to bring the *Journal* back onto schedule and to "strengthen it as a scientific publication," West assumed the editorship.<sup>39</sup> But West's report to Council of March 1975, coming one year after O'Neal's resignation, did not bode well for the *Virginia Journal of Science*. Not only had the last issue of Volume 25 come out approximately seven weeks after its anticipated date, but also its slim size attested to the small number of papers submitted. "One obvious factor in submission rates," pointed out West, "is the desirability of the *Journal* as a place to publish. For academic people this will depend on the attitudes of their superiors towards the *Journal*, in other words its "respectability." In order to increase respectability, West said that he had tried to strengthen the review system by requiring the manuscript to be read by at least "two out-of-state and recognized reviewers." Another problem, he asserted, is the *Journal's* interdisciplinary nature, for "achieving quality among diversity" is not always possible. Finally, West stated, the articles in the *Journal* are not always of "general enough interest." Far too many articles focus on biological sciences, as very few manuscripts are received from mathematics, the physical sciences, and social science.<sup>40</sup> Although he was clearly discouraged, West's decision to step down in March of 1976 was due to personal reasons.<sup>41</sup>

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It is clear that the leadership of the VAS understood the reasons behind the on-going plight of their *Journal*. At this point, the most obvious difficulty was the impossibility of competing with national journals. The same reasons that affected membership, particularly from the level of senior scientists, were affecting the *Journal*. Compounding these problems was the narrow focus of the articles. Given this recognition, it is curious that Council did not formally consider that in the absence of a radical restructuring — from the mission of the *Journal* to its content and distribution — the *Journal* could only limp along into the future, hanging by the thread of good-will and limited financial support provided by the parent organization. Surely such a restructuring must have occurred to at least some of the members of Council, but there is no evidence in the “Minutes,” in correspondence, or in oral interviews of such a consideration. It therefore appears likely that so closely was the idea of the *Journal* tied to Council’s conception of the Virginia Academy of Science and the Academy’s own sense of itself that any major change, at least for the time being, literally was unthinkable.

#### *Great Dismal Swamp Project*

In April, 1964, J. T. Baldwin, Jr., reported to Council on his long study and editorial work on the proposed Academy publication, *The Great Dismal Swamp*. According to Baldwin, the manuscript, initiated in 1951, had reached completion in 1963 and recently had been reviewed by a reader for the University Press of Virginia. On the basis of this review, Baldwin declared the manuscript not fit for publication; indeed, a number of chapters required extensive rewriting and updating. However, Baldwin assured Council that the editing would be done expeditiously, as he was all-too-aware of the efforts of commercial groups to obtain control of the swampland.<sup>42</sup> Five months later, Baldwin mailed his progress report to Council, claiming all but two sections were finished; such claims were to become a constant refrain over the next few years.<sup>43</sup> In late November, 1967, Baldwin sent the following memo to Virginia Academy President Stanley Williams, promising:

I can have the manuscript for a general book on the Swamp ready for publication by the end of the semester under two conditions: that I am assured that there are funds for publishing and that a competent individual be found to write an acceptable chapter on the soils of the Swamp...It

has been suggested that the manuscript be published piecemeal or that the manuscript be xeroxed and distributed: I accept neither of these suggestions.<sup>44</sup>

After hearing Baldwin's conditions, Council addressed each point in turn. First, available funds for publication remaining from money in the Academy Trust Fund resulting from the James River Basin publication might be used for the publication. Second, Council informed Baldwin that, in fact, Edwin Henry, whom expert Sam Obenshain considered the "most knowledgeable person available on Swamp soils," already had revised the chapter on soils and had "done a good job on this chapter." As chair of the Publications Committee, Walter Flory then lamented:

It is desirable to complete this project by publication of the manuscripts available. Your chairman is "stymied." If you have any suggestions for procedure, your help on this problem — in any appropriate manner — is earnestly solicited. I am sure some Dismal Swamp chapters have been written for some time. Use should be made of them before they get "too cold."<sup>45</sup>

Exactly one month later, Baldwin still had not corresponded with any member of Council or the Publications Committee. In a letter to Rae Carpenter of Virginia Military Institute, Flory remarked that he "knows Baldwin fairly well" and would try a second letter to him — he had sent one earlier, in October, but received no response. "If that doesn't bring an answer, I will call him and perhaps can arrange to meet him in Williamsburg to discuss this."<sup>46</sup>

In January, 1968, Flory tried yet another letter to Baldwin. Flory wrote:

Prior to our October 22 Council Meeting in Charlottesville, I wrote to you, on October 18, asking if you would let me know the status at that time of the Dismal Swamp manuscript so that the Council could take action concerning its publication. I have never had a reply to that inquiry.

Flory continued, indicating that Council had agreed that both too much time and money had gone into the project to allow it to "become more obsolete than it already may be." He informed Baldwin that editor Herbert McKennis of the *Journal* had offered to arrange for the study to



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be issued through the Academy publication. Flory concluded by asking Baldwin to contact him before the close of the week.<sup>47</sup>

Baldwin did reply, on February 15, 1968, curtly and authoritarily stating:

I plan soon to give further attention to the Dismal Swamp manuscript. When it is ready for publication, I shall let you know. As I have previously stated, I can not [*sic*] agree to piecemeal publication of this study.<sup>48</sup>

Upon receiving Baldwin's letter, Flory promptly forwarded it, with what must have been dismay, to his fellow members of the Publications Committee, reminding the group that the Dismal Swamp project had been initiated sixteen years previously, with publication of manuscripts pending for many years. Furthermore, pointed out Flory, the spring 1967 action that had been promised by Baldwin had yet to materialize, and Baldwin's most recent memo did not amount to anything, "except to again delay indefinitely." Flory proposed to turn the matter over to Council at its next meeting.<sup>49</sup>

During the March Council meeting, Flory and the members discussed various strategies for preparation of the Dismal Swamp manuscript. James Midyette moved, and it was accepted, that Council authorize the Publications Committee to do whatever necessary to "assemble, edit, and publish" the project manuscripts.<sup>50</sup> Secretary Rae Carpenter agreed to inform Baldwin of this decision via the post.<sup>51</sup> Baldwin's subsequent lack of response forced Flory on April 12, 1968, to send the biologist the following ultimatum:

Accordingly, I request you mail or express these [the Dismal Swamp manuscripts] to me at once, to be in hand here by not later than 10 days hence, that is by April 22, 1968.<sup>52</sup>

Flory's letter had some effect, in that six days after its issuance, Baldwin finally acknowledged Secretary Carpenter's letter of March 25th. Not surprisingly, the correspondence was neither friendly nor agreeable. After staunchly defending his position of February 15, Baldwin proclaimed that should the Academy terminate its agreement with him, he would publish on his own: "and my understanding with collaborators is as it should have been from the beginning that manuscripts will be returned upon request."<sup>53</sup> Furthermore, Baldwin declared:

It was my idea, and mine alone, that I put together a popular book on the Dismal Swamp, and I have assembled a rather good one. I have had good cooperation from a number of individuals. But not from others. . . . The book was outlined entirely by me, and I estimate that at least seventy-five percent of the work done on it has been by me. I have edited — often severely — every manuscript submitted at my request and have rejected several. . . . So, you see, this is my project, and I have not the slightest notion of anybody “taking over.”<sup>54</sup>

In trying to make sense of Baldwin’s letter, Carpenter wrote Flory that Baldwin had responded in the “worst possible ways.” Carpenter wondered whether or not legal action might have to be taken, and suggested the original agreement between Baldwin and Council be located in the “Minutes.”<sup>55</sup>

In May, 1968, James Midyette wrote Carpenter. In the course of addressing separate legal questions Carpenter had raised concerning the governing body of the Virginia Academy, Midyette mentioned that he had taken the liberty of also discussing with the VAS’s attorney the present difficulty of extracting the Dismal Swamp manuscripts from Baldwin. Specifically, Midyette had asked him whether or not paragraph (j) of the Academy’s Charter, which reads:

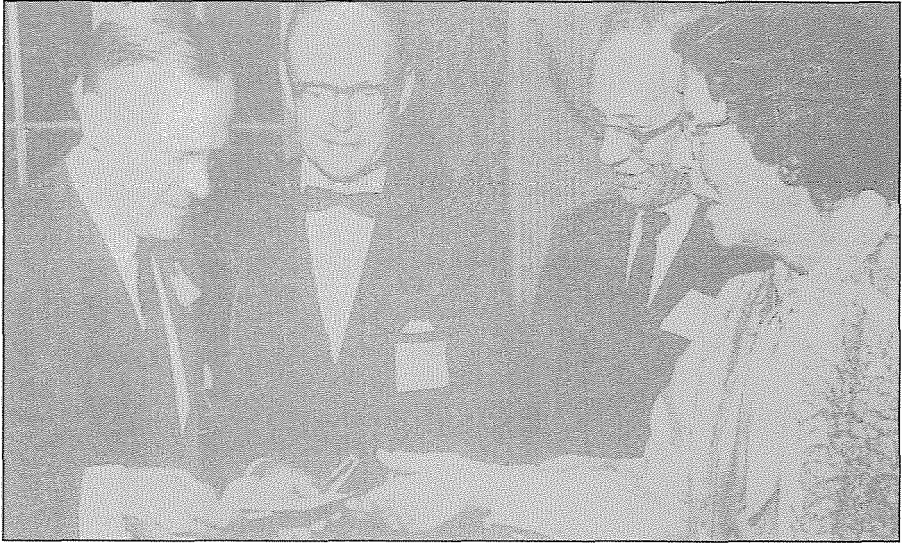
Property Rights of Members: No part of any net earnings of the corporation shall inure to the benefit of any private member or individual. All interest of any member of the corporation in its property shall terminate and vest in the corporation upon his ceasing to be a member thereof by death, resignation, expulsion, or otherwise,

might bear relevance to the present “Dismal Swamp” situation. In Mr. Keith’s view, all manuscripts or documents compiled by any chairman of a committee or project of the Virginia Academy of Science “are the actual property of the Academy” and “legally must be relinquished by the individual when he ceases to function in behalf of the Academy.” Therefore, Midyette asserted, it seemed as if all collaborators on the Dismal Swamp project relinquished ownership rights when they delivered their manuscripts to Baldwin; likewise, Baldwin relinquished his own property rights to any of his “personal contributions” when he agreed to chair the Dismal Swamp project. Finally, Midyette said that

while this action may not be “gracious or pleasant” to consider, it was legal and was therefore ethical. Perhaps, he suggested, the VAS might use paragraph (j) of the Charter to “persuade Dr. Baldwin that his withholding of the manuscripts without just cause is futile.”<sup>56</sup> Whether Baldwin was shaken at the threat of a lawsuit or simply decided to give up his claims of ownership over the Dismal Swamp material is unclear. What is clear is that the material slowly was returned to its authors. Indeed, one year later, on May 8, in his report to Council, Flory stated that some progress was being made retrieving the manuscripts on the Dismal Swamp.<sup>57</sup>

Over the next few years, several papers in which various aspects of the Great Dismal Swamp were featured were published in the *Journal*. Initially, two articles — “The Birds of the Dismal Swamp” by J. James Murray of Lexington and “Forests and Forestry in the Dismal Swamp” by George W. Dean, Virginia State Forester — appeared in the fall issue of Volume 20 of the 1969 *Journal*.<sup>58</sup> In the spring of 1970, two additional articles were published in the *Journal*: “Waters of the Dismal Swamp” by Elmer W. Ramsey, Kenneth R. Hinkle, and Lawrence Benander and “Soils of the Dismal Swamp of Virginia” by Elvin F. Henry.<sup>59</sup> At the same time, Alexander Crosby Brown, maritime historian from Newport News who had been assigned the section on the history of the swamp years before, was at work on what would be a book-length work on the subject titled *Juniper Waterway*.<sup>60</sup> Yet, perhaps surprisingly, despite this spectrum of publication activity, the Virginia Academy’s interest in issuing the full series of the Dismal Swamp project did not wane. Plans went forward to find a new editor.

In presenting the report of the Finance Committee to Council in October 23, 1973, chair Rae Carpenter noted a request for funding for publication of the swamp project by the Publications Committee and asked the chair of the Publications Committee, Perry Holt of Virginia Polytechnic Institute, to discuss the status of the long-overdue project and the justification for such monies. Holt reviewed the swamp project’s latest progress before informing Council that while the University Press of Virginia had endorsed the project, suggesting an early 1975 publication date, they had not settled on an exact dollar amount needed from the VAS to begin publication. Without this data, the Finance Committee recommended, and Council accepted, that VAS appropriations be postponed until further information became available.<sup>61</sup> Holt also reported that he had selected Richard Hoffman, a professor of biology



*Dr. William Ham presents the Horsley Award to H. H. Hobbs, Perry C. Holt, and Margaret Walton in 1968. Holt was chair of the Publications Committee during the difficulties in completing and publishing manuscripts on the Great Dismal Swamp (from newsprint photo).*

from Radford College, as editor for the project, confidently expecting that under new leadership, the long-delayed major publication would come into being.<sup>62</sup>

In July 1974, chairman Holt wrote his friend Richard Hoffman inquiring: "How are the plans for the Great Dismal?" Holt said that at the upcoming Council meeting in November, he would like Hoffman to present the results of his editing, impressing upon Council that the final stages of editing in fact were underway. In this "attempt to get Hoffman moving," Holt declared:

I made no mistake in picking you as the best writer — editor in the state — I will go down swearing that. But others. . . are getting anxious, and remember, I swore to Council that we would finish off the "Great Dismal" project on time or "kill it" once and for all. I must know within the next six weeks what to do at the next Council meeting (November 2). . . If, for any reason, you feel that you cannot take the raw data or get it in time, and, in effect, write a 500-page book between now and next April, there are many honorable ways out for you and I will support you in them.<sup>63</sup>

Faced with what must have seemed a daunting project of unmanageable size, Hoffman decided he could not edit the VAS-sponsored book on the Great Dismal Swamp, and he so informed Perry Holt. Writing Paul Kirk of Old Dominion University, Holt proposed that E. Fred Benfield and Arthur L. Buikema, both biologists and departmental colleagues at Virginia Polytechnic, collaborate with Kirk on the Dismal Swamp project. Holt said that all manuscripts should be in Kirk's hands by December, that the book would go to the University Press of Virginia by the spring of 1975, and he expressed his hope that it might be on shelves in 1976, the Bicentennial year.<sup>64</sup> Kirk accepted the task, but not before he offered his opinion that ". . . the worthwhile and timely project suggested many years ago by I. D. Wilson may be an anachronism today, when much up-to-date popular and technical information is becoming available on the swamp."<sup>65</sup> In early November, 1974, chairman Holt announced that the Publications Committee further recommended the publication of a series of volumes, perhaps paperbacks, on the Great Dismal Swamp, and that the following persons be appointed as a Board of Editors for the Great Dismal Swamp Series: Robert Ake (ODU), E. Fred Benfield (VPI), Arthur L. Buikema (VPI), and Paul W. Kirk (ODU). Council approved the suggestion, and required the Board of Editors to report to it with the specifics, such as publication, schedules, and costs.<sup>66</sup>

The plans of the new Editorial Board to "once and for all" issue a prompt and concise series on the Dismal Swamp did not reach fruition, as over the next year and a half, severe funding problems and difficulties in obtaining manuscripts continually blocked forward movement. Finally, in a discouraged letter to Ake, Benfield, and Buikema, Kirk proposed on January 8, 1976, to "disband our august Dismal Swamp editorial committee for the lack of a *raison d'être*."<sup>67</sup>

Three principal reasons persuaded Kirk to take this course of action. First, the general consensus was that the swamp itself would benefit little from the original concept of a semi-popular work: a number of people already were focusing on this sort of educational direction. Second, other than Benfield and Buikema, Kirk could not locate any collaborators willing to publish fresh material on the swamp for the Academy, especially in the *Journal* — indeed, more prestigious journals or government research reports held much more appeal. Third, the VAS Executive Council and the Publications Committee did not appear to

have committed sufficient funds for soliciting monographs of excellent quality. Finally, and this, Kirk emphasized, was his overriding reason:

[S]ome biological and especially physical scientists have understandably become critical of the implication that the *Virginia Journal* may give special treatment or preference to Dismal Swamp papers in this time of soaring publication costs. . . I would much prefer to see the *Virginia Journal* identified nationally with scientific excellence than with any particular habitat or discipline. . . Please consider this my (our) resignation from the Swamp Publications Subcommittee, so Perry [Holt] can officially and quietly pronounce the death of this last vestige of the Dismal project he inherited.<sup>68</sup>

In March 1976, the Publications Committee recommended to Council that the Dismal Swamp Editorial Board be dissolved and the Virginia Academy of Science “drop the project.” The following initial motion made by E. L. Wisman and seconded by Morrow did not pass, but was defeated by majority vote:

That the Virginia Academy through action of Council and approval of the Academy Conference formally abandon the so-called “Great Dismal Swamp project” as an official part of the activities of the Academy with thanks and appreciation to the many people who have labored long and unselfishly in this effort over the years albeit unsuccessfully.<sup>69</sup>

Instead, Council passed unanimously a first motion by Carpenter: “That the Academy approve the recommendation to dissolve the Dismal Swamp Editorial Board” followed by a second:

That the Academy suspend at this time any efforts toward continuing the Dismal Swamp project, that those persons who have been involved be thanked for their efforts and enthusiasm, but that we reiterate our interest in the study of the Dismal Swamp and publications on the swamp at some future time.<sup>70</sup>

That future time would never come.

What does this ending of the Great Dismal Swamp project, “not with a bang but a whimper,” say about the Virginia Academy of Science? Certainly over a long span of years, the leaders of the VAS indi-

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cated their full support of this project. On the basis of the ultimate fruition of the James River Basin project, which also dragged out over many years, the Academy had every reason to expect that it could ultimately also bring the swamp volume "to the shelves." The choice of Baldwin as editor was obviously unfortunate, and one wonders whether the stress of this very large project may not have had a negative impact on the temperament of this man. Perhaps expectations of the Publications Committee and Council were unrealistic. Certainly, the letter from Holt to Hoffman, giving the latter eight months, mostly during the academic year, to take "raw data" and turn it into a "500-page book" would be enough to give any accomplished editor pause. Ultimately, however, the need of a purely volunteer organization to depend upon largely unrewarded (and certainly unpaid) labor to accomplish a task relies on three things: the importance and usefulness of the task in the overall scheme of things, the perceived professional reward or recognition, and the willingness of a single individual or small team to drive the project forward. The James River Basin project obviously needed doing. The Great Dismal Swamp project, in contrast, suffered from a declining perception within the VAS of the urgency of the task. To Academy members, professional recognition was not seen as forthcoming from the swamp project. And finally, those to whom this project at one time had meaning were no longer interested in devoting the necessary time for its completion. That said, it is noteworthy that the long-running VAS interest in and support of the swamp research did have a desirable outcome, although not the outcome the Academy desired. When Brown's *Juniper Waterway* was published by the University Press of Virginia in 1980, it was a testimony to the staying power of an aging historian; in making it to a second printing, it was also evidence of the validity of the original conception so many years before. And interest in the swamp fit well into the general area of commitment to the environment that characterized the Virginia Academy of Science.

#### *Environment and Natural Resources Conservation Efforts*

The Virginia Academy of Science had long viewed conservation of the environment as an avenue for Academy activity. Indeed, three years into its existence, the VAS established the Committee on the Preservation of Natural Resources, only to change its name to the Committee on the Conservation of Natural Resources one year later. A success-

ful effort to save Goshen Pass, the publication of *The James River Basin: Past, Present, and Future*, and the foray into the Great Dismal Swamp testify to the commitment of Academy members to protecting Virginia's natural resources — both through active lobbying and education of the voting public. Yet in the early days of the Academy, interest in the environment was far from widespread, and public involvement among Virginians was almost nonexistent.

During the mid-sixties, it would be surprising — although supporting evidence is not available in the Academy archives or in the oral interviews — if Rachel Carson's 1962 serialized publication *Silent Spring* had not strengthened the commitment of at least some members of the VAS to fight for the "rights of nature."<sup>71</sup> Certainly, Carson's dramatic publication awakened a sleeping public to the problems at their doorstep, and, as time would tell, nowhere was there a public more in need of awakening than in Virginia. By the 1970s in the nation at large, fighting for the "rights of nature" gained an entirely new meaning, as slowly the environment was brought under federally mandated protective regulation. President Nixon's authorization of the Environmental Protection Agency (EPA) in 1970 was cheered by environmentalists throughout the nation. In 1972, amendments to the 1955 Clean Air Act and the 1960 Clean Water Act turned what amounted to minor recommendations into national, powerful agents of change. Indeed, these acts, broadened and deepened, represented a substantial rallying point for the many people whose growing awareness of the problems of pollution moved them into activist positions.<sup>72</sup> And academic scientists, who had long been generally aware of the potential for ill posed by the pressures of population and industrial pollution, were among those drawn into the quickening public debate.

As one would expect, in the Commonwealth of Virginia, institutions of higher education welcomed the "push" for the environment. The new interest in the environmental sciences translated into many programs and scientific opportunities. For example, the Virginia Institute of Marine Science (VIMS), which had been affiliated with the College of William and Mary since its beginnings in 1938, was made an independent institution by the Acts of Assembly in 1962, and the explosion of interest in environmental matters put considerable new funding into the Institute.<sup>73</sup> The Institute was charged with planning and carrying out basic and applied research on marine life within Virginia's tidal waters and those eventually emptying into the Atlantic Ocean,



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and it was to act as the advisory arm of the Marine Resources Commission, the state's regulatory body for fisheries.<sup>74</sup> In May of 1970, Virginia Polytechnic Institute opened the doors to its Center for Environmental Studies designed to foster research activity aimed at offering solutions to environmental problems, solutions that might be helpful to the government and industry. The Virginia Institute for Scientific Research in Richmond formed a Division of Aquatic Biology to conduct:

...both laboratory and field investigations in aquatic ecology with particular emphasis on determination of the degree and kind of industrial use to which bodies of water can be put without degrading their quality for recreation, food production, and other uses.<sup>75</sup>

Finally, on September 16, 1970, Governor Linwood Holton announced

...the Governor's Council on the Environment for the purpose of advising and assisting the Governor on matters pertaining to man's environment and the quality of life in the Commonwealth.

The Executive Order mandated that, "[T]he Council shall assist and encourage the programs and activities of those agencies of state and local government dealing with any aspect of the environment. . . Membership of the Council shall not exceed twenty in number."<sup>76</sup> As alarming as the developments pointed to by Carson and a chorus of others might have been, in many ways this was an exciting time for scientists who for many years had been alone in voicing concern for the environment. Like the other groups, the Virginia Academy of Science would take new heart from the public attention.

Chaired by the indefatigable Roscoe Hughes, the activity level of the Committee on Conservation and Natural Resources reached new heights. Following a new "eco" theme, the Committee sent out an informative letter to members of the Virginia Academy of Science in February, 1971. The letter was divided into three parts: "Eco-Tips," "Eco-Shocks," and "Eco-Institute." Under the first heading, "Eco-Tips," Lynn Abbott, editor of the *Journal*, asked to have all items about "courses, forums, and programs in ecology throughout Virginia" sent to the *Journal* for publication. "Eco-Shocks" introduced a more involved, "activist" endeavor:

It has been said that a quality environment should be everyone's business. A first step in preserving our natural resources and preventing further ecological imbalance would be to identify environmental threats and potential threats. Once identified, the Academy can play a leading role in bringing about concerted action to correct such imbalances. Therefore, would you provide the Committee with information of this type in your community?

Finally, the committee introduced the idea of an Eco-Institute. A Virginia Institute of Human Ecology would focus on long-range planning for the whole environment and could potentially serve as a "clearing-house for locating ecologists and other eco-oriented professional and technical personnel throughout the Commonwealth."<sup>77</sup>

By March 28, Maurice Rowe, VAS President for 1970–71 and Commissioner of the Virginia Department of Agriculture and Commerce, announced to Council that he had presented the idea of a Virginia Institute of Human Ecology before the Governor's Council on the Environment. That Council, Rowe said, had appointed a three-man study committee of Roscoe Hughes, Charles Williams (a White House staff member), and Rowe himself to determine the feasibility of such an institution. As conceived by Hughes, the Institute would be non-profit, "financed, and governed by a large board of approximately one hundred people from all professions and areas within the Commonwealth. Women's groups, industry committees, and similar organizations would "assist in identifying problem areas" in environmental health. Though the recommendations of the three men were positive and the Governor's Council along with the Virginia Academy of Science appeared supportive of the undertaking, the support never translated into action. Perhaps because of the number of activities springing up and problems being identified, only those recommendations satisfying twin conditions of a solid base of financial support and filling an immediate need had tangible results.

Under Hughes' aggressive leadership, the members of the VAS Committee on Natural Resources actively promoted the importance of environmental concern. For example, in May 1972, Hughes persuaded Council to pass the following resolution:

The Virginia Academy of Science recognizes the importance of preserving our wilderness area and therefore urges its members to write the President of the United States

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requesting him to utilize the powers of his office to accelerate the programs of review of lands covered by the Wilderness Act of 1964.<sup>78</sup>

Not only were copies sent to President Nixon, but also to the Representatives and Senators of Virginia. The very next morning, with Hughes' help, the Virginia Academy of Science sponsored a colloquium entitled "Virginia's Environment: Where Do We Stand Today?" with six speakers from various institutions around the Old Dominion.<sup>79</sup>

Where the Commonwealth actually stood, unknown to anyone in either the state government or the Virginia Academy of Science, was on the brink of a disaster that would bring national attention to Virginia of a particularly unfavorable sort: the Kepone crisis. The Kepone crisis would also involve the VAS in a new and important relationship with the government. So significant to Virginia politics was the Kepone situation, however, and so closely was it tied to the science advisory system that it will be dealt with in that context near the end of this chapter.

#### *Science Education*

As it had over the last three decades, the Virginia Academy of Science continued its emphasis on improving the quality of science education, both secondary and higher, within the Commonwealth. Beginning in the early 1960s, the VAS primarily focused on raising the pedagogical standards of the State's two thousand-plus high-school science teachers. Organizing the Virginia Academy's efforts, the Science Education in Virginia Committee directed its attention to two similar areas: first, bringing together the state's teachers to introduce new techniques and knowledge in the sciences and second, refining requirements for certification of science teachers. Also contributing to excellence in science education, the Visiting Scientists Committee and the Science Talent Search Committee demonstrated to high-school students the excitement of "doing science" and promoted scientific careers.

In October, 1964, the Science Education in Virginia Committee, under the leadership of John Forbes, listened as member Fred Millhiser, Director of E. I. Du Pont de Nemours and Company's Benger Laboratory in Waynesboro, asked that the VAS consider post high-school technical education in the Commonwealth as part of its mission. Millhiser pointed to the new State Department of Technical Education established by the 1964 General Assembly and the recently appointed Governor's

Commission on Higher Education as indicators of the need for the VAS to "jump on board." "Virginia really has an educational problem and frequently has a strong vocational problem," he said. "Further, in view of this committee, when you talk vocational and technical education — you are talking science." Millhiser went on to urge the Science Education in Virginia Committee to sponsor a conference or symposium devoted to post-technical high-school education at the next annual meeting. Such a conference, he stated, would "best bring to the attention of the membership the needs in this area, and would produce not only interest but perhaps some movement in the direction of a desirable solution."<sup>80</sup>

Millhiser did not have much difficulty persuading his fellow committee members to recommend such a symposium to Council, and the latter readily moved that on May 8, 1965, the VAS would hold a symposium titled "Planning for Technical and Scientific Post High School Education in Virginia."<sup>81</sup> Since a necessary goal of the symposium was to reach the science teachers of the state, chairman Forbes made every effort to encourage their attendance. For example, in January 1965, he wrote to members of his committee that Franklin D. Kizer, Supervisor of Science for the State Department of Education and an active VAS member, had said that approximately 2300 science teachers filled Virginia's high schools. Accordingly, Forbes arranged to send several copies of the program to each high-school principal, requesting that they post the program and verbally promote the symposium. Also on the suggestion of Kizer, Forbes contacted the Virginia Association of Science Teachers and asked for the Association's help with publicity.<sup>82</sup>

The program opened with the following statement prepared by Millhiser:

It is generally recognized that post-high-school technical and scientific education is one of the major problems facing Virginia. This results not only from the worldwide knowledge explosion but also from the increased population of the post-high-school age group. In recent past, the government and the legislature have undertaken new programs and studies in this area. The purpose of this conference is to discuss the needs and possible new directions under consideration to provide for them.<sup>83</sup>

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Judging by the encouraging comments throughout and the attendance of more than one hundred teachers, the conference was a success. Millhiser, along with the Science Education in Virginia Committee, had secured four speakers — George L. Sandwig, Director, Division of Vocational Education, State Department of Education; Dana Hamel, Director, State Department of Technical Education; Prince Woodward, Director, State Council of Higher Education; and Henry Tulloch, Manager, Employee and Public Relations, Specialty Control Department, General Electric in Waynesboro. From this diversity of expertise, these individuals capably addressed the wide-range of concerns relevant to technical and vocational education.<sup>84</sup>

The success of this first endeavor resulted in the VAS's continued sponsorship over the years of other symposia and conferences relevant to science education, both within the framework of the Annual Meeting and in conjunction with other educational organizations. An excellent example of the Virginia Academy's reaching outside the boundaries of its own meetings took place in 1975 at the recommendation of Frank Kizer. Earlier, at the Council meeting in November 1974, Kizer had described the annual State Science Teachers Conference, held usually the last weekend in September or the first weekend in October. According to Kizer, the VAS could reach a number of science teachers should the Academy assist with the Conference. Specifically, the Virginia Academy might offer four services: co-sponsor the conference at no cost to the VAS; handle commercial exhibits; have a member on the Planning Committee; and arrange for Visiting Scientists to take over classes so teachers could go to the conference during school hours. Leonard Morrow endorsed Kizer's motion and Vera Remsburg seconded it.<sup>85</sup> Council named a special sub-committee chaired by Virginia Ellet with Marvin Scott and Ertle Thompson — all three of the Science Education in Virginia Committee — to assist.

The Virginia State Teachers Conference took place in October, 1975, at the Hotel Roanoke. Ellett's Committee set up five VAS "events": a Metric Workshop by Daniel Yates of the Mathematics and Science Center in Richmond; a Chemistry Demonstration by Robert Bell of the University of Richmond; "Forestry Stories Worth Telling" by Leo Cheeseman of Southern Forest; "Sea Urchin Embryology," by R. Wesley Batten for the Mathematics and Science Center; and two field trips — the first a Natural History Tour of the Roanoke Valley, and the second, a visit to the Virginia Science Museum, by Don Kunze of Virginia West-

ern Community College. On the basis of an evaluation of the participants' reactions, Ellett, Scott, and Thompson declared the Virginia Academy's contribution to the conference a complete success.<sup>86</sup>

While focusing on the symposia and conferences, the Academy did not neglect the more mundane aspects of science education. Obviously, Virginia's certification requirements struck at the core of fostering excellence in science education, as the competence of the educator translated into the quality of education the students received. As past-president Jackson Taylor explained to Council on May 8, 1965, the Science Education in Virginia Committee recently had submitted a resolution to the State Superintendent of Public Instruction and the State Board of Education in Virginia in which it outlined its preliminary study of the undergraduate preparation of teachers in science and mathematics. Many members of the Virginia Academy of Science had contributed to the analysis through their respective colleges. As noted in correspondence to Taylor, the positive response of the state agencies was encouraging, and conditions appeared conducive to an on-going analysis by the Science Education in Virginia Committee as a means of constantly staying "on top of" the caliber of Virginia teachers.<sup>87</sup>

Another aspect of science education in which the VAS members found themselves interested was the selection of science textbooks for elementary and secondary school students. Frank Kizer relates the story of the Academy's initial involvement in the early seventies:

I went to Senator Lloyd Bird and said "Lloyd, the Academy really needs to be involved in textbook selection in the State. I think you ought to take a look at the criteria. I found when I went to the State Department of Education that it was atrocious. There is no way you can judge a textbook by this criteria." I said, "Who cares if the book falls apart or the print is large or the qualifications of the writer. How do you determine his qualifications except for the written word? Here it is in print. This is what you have to look at. I don't care if he [the author] went to Cornell or MIT."<sup>88</sup>

Kizer's point was well-taken, and, for the duration of the 1970s, the VAS unofficially was involved in the textbook selection process, advising Kizer and his aides.<sup>89</sup>

### *Visiting Scientists Program*

Instituted in 1959 through a grant received by the Virginia Academy from the National Science Foundation (NSF), the Visiting Scientists Program continued to move forward, though not with great speed. In 1965 at the March meeting of Council, Roscoe Hughes announced that \$5000 had been requested and subsequently granted from the NSF to finance the Visiting Scientists Program under the new direction of Colonel S. M. Heflin of Virginia Military Institute, who was retiring from the Physics Department.<sup>90</sup> Three months later at the Academy Conference, Council informed the membership that about sixty visitation days for professors to speak at high schools throughout the state would be arranged.<sup>91</sup> While several members pointed out that the Virginia Academy of Science had tried such a lecture program several years earlier and it had failed due to conflict with high-school administrators, the prospect of Heflin's able leadership seemed to raise expectations that the program would be worthwhile. Such expectations were on target, and three years later at the Academy Conference, the new chair of the Visiting Scientists Committee, I.D. Wilson, was able to report that seventy-seven high schools had requested visits and were "frequently most complimentary about last year's program." In fact, 117 scientists were listed as prospective visitors.<sup>92</sup>

At the annual meeting in 1968, President Paul Siegel informed Council that when the NSF-supported Visiting Scientists Program funds expired, as specified in Academy regulations, it would become his duty, as leader of the VAS, to head up the Academy's Visiting Scientist Program. Given the responsibilities of his presidential position, Siegel suggested the program might be administered by the President-elect. As the current President-elect, Rae Carpenter was agreeable to Siegel's recommendation.<sup>93</sup>

Carpenter used his excellent ability to network, and in August of that year, the Superintendent of Public Instruction gave his permission, once again, for the program to be operated in public schools. That same month, forty-two college presidents agreed to support the Visiting Scientists Program by providing travel expenses for any of their faculty who volunteered to speak. All in all, 237 speakers from twenty colleges volunteered and provided topics on which they would speak. To give order to what might have been an unwieldy program, Carpenter wrote a set of guidelines for operation of the program and included an extensive list of the speakers and their topics. By September 1968, Carpenter

announced that more than 400 requests had been made for this list.<sup>94</sup> Seven months later, Carpenter reported to Council that more than two dozen visits had been reported.<sup>95</sup> The response of the public schools quite obviously had been enthusiastic, and it was evident that the program had successfully met a need the VAS had long perceived.

The continued level of activity of the Visiting Scientists Program encouraged James Midyette, Jr., Chairman of the Constitution and By-laws Committee, to submit, in May 1975, the following constitutional changes for adoption:

Amend Article VIII, Section I as follows: Insert "Visiting Scientists Program Director" in 3rd sentence. Amended sentence to read "In addition to the foregoing, the Chairman of the Standing Committee, the Editor of the Virginia Journal of Science, and Visiting Scientists Program Director shall be members of Council."<sup>96</sup>

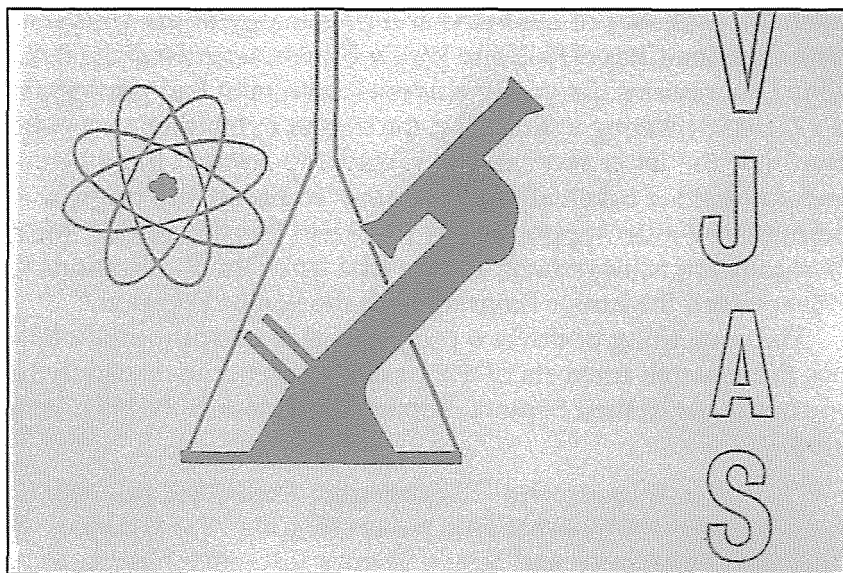
Midyette's changes passed Council.

In 1976, the first director of the Visiting Scientists Program, Dale Ulrich of Bridgewater College, informed Council that while the program remained successful, fewer requests for speakers from high schools had come into his office over the last year — the number had dropped from 101 in 1974–75 to seventy-nine in 1975–76. On the other hand, requests from two-year colleges had increased from thirteen to twenty-one. Hence, Ulrich did not find any immediate reason for alarm. However, Ulrich planned to distribute the Speaker's List in late August, and to the principals of the schools rather than the chair of the science departments as he had in the previous years.

It is revealing to speculate on the reasons for the success of this program at this particular time. Certainly the fundamental elements of the educational system in the Commonwealth had changed very little in the years between the first failed attempt to inaugurate such a program and the successful one. What does appear to have changed were the VAS people in charge. Both Helfin and Carpenter were able and pragmatic leaders. They had worked together at VMI for years. But perhaps even more important was the marked ability of Carpenter, which reveals itself again and again, to tap into a network of friends and supporters that he had astutely developed and maintained. This case is yet another example of the critical role in a volunteer organization of the individuals assuming leadership and of their ability to see a project through to inauguration or completion — often with the help of



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*An early logo of the Virginia Junior Academy of Science.*

well-placed colleagues around the state. Further, it represents one of the many efforts made by the VAS to interest young people in the sciences. The chief of these efforts was, of course, the Virginia Junior Academy of Science.

#### *Virginia Junior Academy of Science*

Following in the footsteps of W.W. “Bill” Scott, E. L. “Chick” Wisman assumed the leadership of the Virginia Junior Academy of Science in 1964, a position he would hold until 1972. With his personable, easy-going manner, the biochemistry professor from Virginia Tech proved an excellent choice. Under his guidance, the VJAS continued to strengthen both in numbers and in quality — leading to its national recognition in 1971 by the AAAS as one of the “strongest Junior Academies in the nation.”<sup>97</sup> The interest of senior scientists in the youngsters in the schools was especially important in a state where the quality of science education was highly variable among the school systems.

At the annual meeting in 1968 at Massanetta Springs, the Virginia Junior Academy of Science celebrated its silver anniversary, proudly boasting a total of 124 affiliated clubs with a membership of 4,125. As part of the event, the VJAS Committee invited two speakers, Carl W.

Gottshalk, professor of medicine and physiology at the University of North Carolina-Chapel Hill, and Walter Brown, scientist at the Bell Telephone Laboratories. As young students, both men had participated in the 1941 VAS meeting at Roanoke, the former exhibiting a collection of butterflies, the latter receiving the Academy Award. In addition, the Academy held a cake-cutting ceremony to honor the original VJAS Committee members appointed by President Wortley Rudd.<sup>98</sup> Marking this significant achievement, for the first time, the Publications Committee printed the Junior Program with the Senior Program.<sup>99</sup>

The combining of the two programs was an appropriate linkage, since the research interests of the Junior Academy increasingly began to mirror those of their Seniors. Reporting to Council in 1971, Wisman stated:

[I]n keeping with the changing times, the [junior] program shows a change in paper categories. For example, the Astronomy and Space Science Category has been replaced by a new one — Environmental Science. Last year five papers were submitted in Astronomy and Space Science; this year 35 were submitted in Environmental Science.

Wisman ended by noting that “the interest in our junior scientists is no longer all ‘up in the stars’ but rather, is turning towards ecology and problems of ‘down to earth’ concern.”<sup>100</sup> In addition to creating new sections, the VJAS also divided its larger sections according to specialty. As described by Wisman:

We just changed categories. A breakdown — our Biology Section got so big and there were so many papers that we finally decided on Molecular Biology and whatever. We revised categories. That is the one big thing we [the VJAS Committee] did, although I guess since we screened the papers for those who could come to the Annual Meeting, there was excellent competition.<sup>101</sup>

The strong ties between the senior and junior members could not be more evident than by this shift in sections. The juniors were reflecting the senior members’ research interests. In every way it was a healthy situation, and it was one that held promise for even further development. That development was shortly to come.

#### *Four: Translating Industry, Transforming Science*

Not long after the 1972 meeting, Wisman resigned as chair of the VJAS. Lee S. Anthony of Roanoke College succeeded him, a position he would hold for the next three years before being relieved by John L. Hess. The time in office of both men was characterized by their mutual drive to further develop the level of scientific performance of the VJAS. Hess, especially, was acutely aware of the vital interplay between the Junior and Senior Academies of Science. Indeed, after attending the 1976 AAAS meeting, where he met with delegates from the country's junior academies, Hess observed: "Of greatest importance was my recognition that the model of cooperation and mutual respect now functioning between VAS and VJAS is among the best in the country. I clearly see the concerns and mission of VJAS best nurtured within the relationship it has with the VAS."<sup>102</sup> The guidance of the VAS would, in the view of both Hess and his predecessor Anthony, assure the high quality of the research and the papers submitted by the young people.

At the annual meeting in 1976, the leadership of the Virginia Junior Academy of Science had reviewed a total of 300 papers, from which 193 were selected for presentation. 582 students and chaperones attended the meeting, along with thirty-nine judges.<sup>103</sup> Despite the high attendance, Hess informed Council that only about twenty percent of Virginia's secondary schools participated in the Junior Academy — giving him cause to ask Council to consider ways to "get more high-schools involved."<sup>104</sup> Hess was, as usual, forward-looking in his concern for Virginia's youthful citizens.

By 1976, the Virginia Junior Academy of Science was clearly well-established, both as a part of the Virginia Academy itself and in those secondary schools that were sufficiently interested to take part. One may take the point of view that the VJAS allowed the VAS successful entrée into the school systems' science divisions — one that might have failed with a more direct approach. The antagonisms between the worlds of higher education and the public schools had been well-illustrated by the early difficulties with the Visiting Scientist Program, and it is a tribute to the leadership of the VJAS as well as to the interaction of the members with the young people that such antagonisms did not arise. The success of the Junior Academy and its importance and centrality to the mission of the VAS meant that the VJAS — by design — had now become and would remain for the foreseeable future a major focus of the Senior Academy.

*State Museum of Science*<sup>105</sup>

If the VJAS represents an example of a VAS program showing steady, successful progress, the same cannot be said of a state museum of science. By the early 1960s, the Long Range Planning Committee, led by Henry Leidheiser, had resurrected the Virginia Academy of Science's long-dormant enthusiasm for the establishment of a state science museum. In 1963, the committee directly approached Governor Albertis Harrison:

Whereas the need for an inspiring science museum in the Commonwealth of Virginia has been apparent for many years. . . . Be it hereby resolved that the Virginia Academy of Science recommends to the Honorable Albertis S. Harrison, Governor of Virginia, that he appoint a committee of dedicated Virginians to study the present Museum of Minerals, Timber, and History, to consider means for short-range and long-range improvement of the Museum, and to make recommendations concerning the scope and objectives of the Museum.<sup>106</sup>

Undoubtedly, the resolution influenced Governor Harrison's decision to bring the matter before the State Legislature. The following year, the General Assembly directed the Department of Conservation and Economic Development "to make a study" in concert with a gubernatorially appointed nine-member Virginia Legislative Advisory Council and "to offer a plan for the encouragement or establishment of a properly located, designed, and operated museum of science, archaeology, and natural science. . . ." <sup>107</sup> Furthermore, this Advisory Council shall request the cooperation of the Virginia Institute for Scientific Research, the Virginia Academy of Science, and other interested groups." The bill also authorized the closing of the old State Museum and dispersal of the exhibits and fixtures.<sup>108</sup> In June, Governor Harrison named the Advisory Committee and directed it to report to him by the beginning of September 1965. The committee met several times before recommending that a Study Commission be named to look further into the matter. In fact, in 1966 a draft bill (House Bill #618) was introduced to implement such a Study Commission. Governor Harrison, however, did not act on the bill, and it would be another administration that named the suggested commission several years later, in February, 1969.<sup>109</sup> In the eventual Study Commission's final report, the delay was explained as "probably due to the lack of a legislative sponsor and the

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absence of a concerted effort on the proposal's behalf by the citizens of Virginia."<sup>110</sup> Whatever doubts may have lain behind the government's slow start, the Virginia Academy of Science did not appear to share them.

Virginia Academy President Foley Smith detailed the legislature's recent actions concerning the proposed science museum at Council during the annual meeting in 1964. After urging the VAS to work with the Virginia Legislative Advisory Council and the general public for establishment of the Museum, President Smith listened with concern as several Council members voiced their apprehensions as to the value of "inanimate natural science exhibits" and questioned the "need for a Museum so close to the nation's capitol." The group raised sufficient doubts for President Smith to refer the matter to the Long Range Planning Committee for full consideration.<sup>111</sup> Some of the anxiety concerning the attractive potential of a museum of science so close to the many offerings of the Smithsonian and other attractions in Washington, D.C., might have seemed on target, but in fact they ignored the potential for outreach offered by a state museum that could interact on a more intimate level with the schools of Virginia.

Several months later, the Long Range Planning Committee carefully considered the statements made by all Council members before unanimously reaffirming the previous action of the Virginia Academy of Science favoring the establishment of a state museum of science. It was obvious that the committee had concluded that the problems in establishing a museum were beyond their immediate purview and should be dealt with by some other group. Hence, the Long Range Committee recommended to Academy President Sam Obenshain and Council that a permanent Museum Committee be established with responsibilities to the President and Council. Furthermore, the committee indicated that the interim Ad Hoc Museum Committee, which earlier had examined the feasibility of a museum of science, might be an excellent "nucleus" for the new permanent committee.<sup>112</sup> In following these suggestions, Council asked James Midyette, Foley Smith, and Roscoe Hughes to be part of a "special museum committee" until a standing Science Museum Committee could be named. It would not be until October 1968 that the new committee became official; yet progress under this Special Committee and the consistent efforts of the VAS science museum advocates moved the project steadily forward.

*A History of the Virginia Academy of Science*

Anxious for the museum to become a reality, in May 1967, James Midyette reported for the Special Committee before Council, suggesting that the following resolution to be sent to Governor Mills Godwin. Not surprisingly, Academy President Roscoe Hughes moved for its adoption, and the following statement unanimously passed:

WHEREAS, the improvement of education and the need for educational resources have most urgent priority in Virginia, and

WHEREAS, there is a growing need to create a public awareness of the role that science plays in technology vital to the continued economic and industrial growth of Virginia, and

WHEREAS, all citizens of Virginia, both young and old, need the opportunity to become more scientifically oriented and motivated, and

WHEREAS, a Virginia Museum of Science, adequately staffed and equipped, could make a paramount contribution to the advancement of scientific activities in Virginia,

THEREFORE BE IT RESOLVED, that the Virginia Academy of Science reaffirm its endorsement of the establishment of a functional state museum of science, and

BE IT FURTHER RESOLVED, that the Governor of Virginia be respectfully requested to use his good offices to promote and further the objectives for which the Virginia Museum of Science Commission was established in 1946, and

BE IT FURTHER RESOLVED, that the Virginia Academy of Science offer its assistance to the Governor and the Virginia Museum of Science Commission to achieve these ends.<sup>113</sup>

Slightly over seven months later, Council met to discuss methods by which it might encourage the state to take action on the science museum. The idea of securing a General Assembly resolution during the 1968 session to have the Virginia Advisory Legislative Council undertake the already-recommended study seemed to hold the most chance of success. Hughes moved that the Virginia Academy's Ad Hoc Museum of Science Committee be continued and that this matter be pursued in a "dignified persuasive manner."<sup>114</sup> President James Cole of the VAS followed up this recommendation in letters to the Academy

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membership and to a variety of people throughout the state in which he pointed out the following:

Recently a committee of the Virginia Academy of Science made a study which re-emphasized the need for a modern, dynamic State Museum of Science, showing the evolution of science, illuminating science as it is today and projecting science for the future. . . . You may recall at the annual spring meeting held in Norfolk this year, the Academy passed a resolution requesting the Governor to reactivate the old Museum of Science Commission, originally appointed in 1946. . . . It now seems that a better course toward our goals by working through a Science Museum Study Commission of the Virginia Advisory Legislative Council (VALC) rather than reactivate the Old Science Commission. . . . In order for the VALC to appoint a new museum of science commission, it appears that a resolution must be adopted by the 1968 Assembly. . . . WE URGE YOU TO TAKE TIME OUT TO SEE THE DELEGATE OR SENATOR FROM YOUR REGION WHOM YOU KNOW BEST, AND OTHERS IF YOU HAVE TIME, AND ASK THEM FOR THEIR SUPPORT."<sup>115</sup>

On February 29, 1968, a "Committee Amendment in the Nature of a Substitute for House Bill No. 524" was passed — its passage arguably spurred on by the efforts of the Virginia Academy of Science. "There is hereby created," the Bill stated:

...the State Museum of Science Commission, to be composed of five members, three to be appointed for four year terms by the Governor from the State at large; and one member from the State of Virginia, to be appointed by the President of the Senate, and one member from the House of Delegates to be appointed by the Speaker thereof for terms coinciding with their terms as members of the respective houses. The Commission is hereby directed to conduct a study to determine the feasibility of establishing a Virginia Museum of Science and to determine what the scope and financial requirements should be of such a museum including the appropriateness of concluding a History Division.<sup>116</sup>

The Bill required the commission to conclude its study and make recommendations to the governor and legislature no later than October 1, 1969. Governor Godwin appointed Virginia Academy of Science member Roscoe Hughes, along with Zan Stuart, A. Stewart, Representative Glenn Yeattes, and Senator Parkinson. Hughes asked Virginia Academy of Science President Paul Siegel to appoint a Standing Science Museum Committee of Virginia Academy members to provide expertise to the Governor's Commission. In response, Siegel asked Ed Harlow to chair such a committee, and Susie Floyd, Senator Lloyd Bird, Horton Hobbs, Perry Holt, James Midyette, Michael Koszarab, Gwynn Ramsey, Harry Holloway, and Randolph Gladding to serve as well.<sup>117</sup> A humorous — yet revealing — incident occurred when, upon being asked to serve on the Museum Committee, Horton Hobbs responded:

I am beginning to wonder if perhaps I am a jinx to such a committee, for twice in the past I have been a member of Academy Museum Committees, the efforts of which were apparently not very effective. In spite of this poor record, if you [Paul Siegel] and Ed [Harlow] think that I might be of some assistance then I shall be pleased to contribute what I am able.<sup>118</sup>

At the first meeting of the Science Museum Committee, chair Harlow asked Roscoe Hughes of the commission to convey to the new group the ways in which it might be useful to the commission.<sup>119</sup> Specifically, explained Hughes, the VAS Museum Committee "through its association with all disciplines of Science in Virginia, would provide guidance and advise on the procedures to create a Science Museum in Virginia. . . . the commission will rely heavily upon the Committee and the Virginia Academy of Science."<sup>120</sup> At the close of the meeting, Harlow appointed a small subcommittee, chaired by Susie Floyd and composed of James Midyette and Gwynn Ramsey to compile information on areas of interest to be included in a state museum of science and to prepare a statement to be presented at the next meeting of the Governor's Commission on a Museum of Science. Towards the end of October, the subcommittee submitted a proposed statement on a Virginia Museum of Science to Harlow who, in turn, read the statement before the commission and gave its copy to the secretary of the commission. The resolution read:



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1. That the Virginia Academy of Science had maintained a continuing interest in the establishment of a state museum of science since the early 1940s;

2. That the Commission may be assured of the enthusiastic support of the entire Academy membership, which now numbers close to 2000;

3. That a more definitive and comprehensive statement would be prepared and sent to the Commission in the near future;

4. That in the opinions of representatives of industry, a state museum of science would not only be an important adjunct to the educational services of the state, but also of more import in attracting industry, as it would demonstrate a dynamic interest by the people of Virginia in technological advancements; and

5. That the Commission could be assured of the full cooperation of the Academy in undertaking the establishment of a state museum of science in Virginia.<sup>121</sup>

Several months later the Virginia Academy Science Museum Committee met again. Each member presented a statement expressing their conception of a state science museum. After compiling their responses, it became clear that the conceptions were more alike than different. Overwhelmingly, the members advocated a museum of science that would illustrate "pure and applied science," while serving the "functions of science."

[S]cience sets the limits and provides the conceptual framework for the world view; science provides the basis from technology; science keeps certain people (scientists) busy; and science has aesthetic and entertainment values for not only scientists but for the educated lay public.

Furthermore,

a state museum of science should be given the responsibility for inventorying and preserving collections of, presenting exhibits of, and collating and explaining the principles that determine the wise use of the natural resources of Virginia, both non-living and living."<sup>122</sup>

In order to satisfy these many requirements, the committee agreed that establishing two coordinate centers of the state museum of science

would be necessary. The first center might focus on educational and administrative matters and include the following: exhibit and lecture halls for public viewing and instruction at the center itself, audio-visual capabilities, and the means by which mobile exhibits could be prepared. The second center's concentration, to be called the University Center of the science museum, would follow that of a more traditional research institution: curating and preserving specimens of flora and fauna. In addition, this center would control publication.<sup>123</sup> If this vision of the science museum seems ambitious, it was, particularly the dream of the museum taking the form of a research institution. While the members recognized the importance of education for the public, they were also, perhaps understandably, captured by their enthusiasm for an establishment modeled on one of the famous "science museums" — such as the Smithsonian Institution, with its dual commitment to "the increase and diffusion of knowledge."

Ever pragmatic, President-elect Carpenter of Virginia Military Institute commented on the Science Museum Committee's views, pointing out in mid-December, 1968:

I must state again that any museum complex which is worthy of state funding as a separate entity must appeal to a broad segment of Virginia citizens whose average educational level is barely above that of a high-school graduate. Tourists will be attracted to it but will probably visit only once in many years. Area schools will provide the bulk of its visitors. . . . Research, while it is an important function and should be provided for will not serve many people.

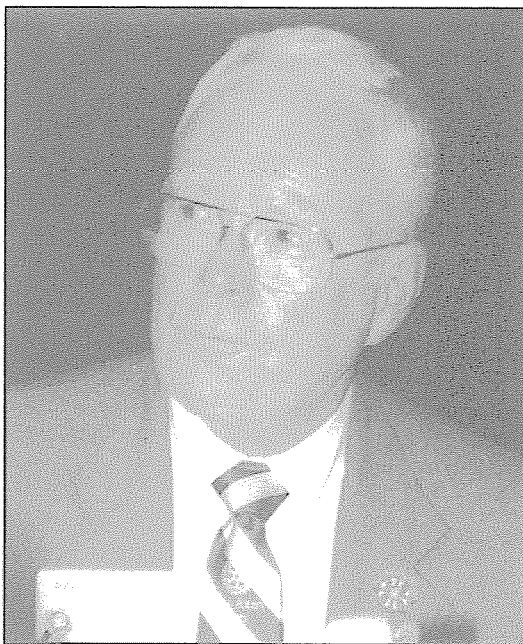
Carpenter continued in the same vein, arguing from his well-developed sense of the political:

To me, the planetarium is an absolute first because it provides an excuse for a building and a staff at the outset and demonstrates an immediate and tangible benefit to the taxpayer in return for funds appropriated.

He agreed with the idea of mobile display units, before offering his opinion on the particular disciplines — "biology, chemistry, physics, geology, medical and agricultural science, engineering including space and material science and technology" — that he thought should be included in planning the museum. History of science, on the other hand,

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*D. Rae Carpenter, Jr., president of the VAS 1969–1970, provided leadership as section member, chairperson of various committees, and trustee for the Virginia Museum of Science. He was selected a Fellow in 1973 and received the Ivey F. Lewis Distinguished Service Award in 1976.*



should not be examined except as it “naturally creeps into each of the areas.” Archaeology and natural history, although perhaps regionally-driven — also might be considered. Despite his obvious interest in the subject and his position as President-elect, Carpenter hastened to add: “I am not a member of the committee and you should not feel obligated to use any part of this.”<sup>124</sup> In many ways, Carpenter’s words were prescient, particularly the concern with funding that lay behind his desire to allow taxpayers to see “immediate and tangible benefits” of the public funds on which the museum must, at least initially, rely.

In January 1969, a public hearing sponsored by the State Museum of Science Study Commission was held in Richmond to inform the citizenry about the proposed museum of science and to listen to their suggestions. While the hearing was not sponsored by the Virginia Academy of Science, its members were present and played an important role in the hearing. During the three-hour hearing, sixteen speakers endorsed the museum, including William Sanger, VAS member and Chancellor Emeritus of the Medical College of Virginia, and Ed Harlow, chair of the Science Museum Committee of the VAS.<sup>125</sup> The commission held other hearings as well, in Norfolk, Roanoke, and the Northern

Virginia areas. Encouraged by the public hearings and hoping to bring the entire Academy membership into the discussion surrounding the museum, Chair Harlow proposed in February at a meeting of the Science Museum Committee that a symposium on the state museum of science be held at the annual spring meeting of the VAS. Topics could be covered such as: the need for a state museum; what its objectives and purposes might be; possible branches or sections of the museum itself; a discussion of proposed locations; suggestions concerning how the museum might be financed; and overall timetables or goals. The results of the symposium could then be reviewed by members outside the Museum Committee proper. Harlow named Susie Floyd, Gwynn Ramsey, and Lloyd Bird to a Symposium Planning Committee with Michael Kosztarab as the chair.<sup>126</sup>

Outside action continued, in addition to planning the symposium. Towards the end of February, Carpenter wrote to Malcolm U. Pitt, Jr., Head of the Collegiate Schools in Richmond; Edgar Shannon, president of the University of Virginia and Association of Virginia Colleges (AVC); and Lewis Warrington Webb, Jr., president of Old Dominion University and chair of the Virginia Council of College Presidents (VCCP), informing the three men of the widespread need for a state museum and of the commission appointed by the governor to look into the matter. The Study Commission's report would be due out in November 1969, explained Carpenter, and would address itself "to the needs expressed by persons throughout the state by various communications to the commission including these public hearings and private communications." Carpenter maintained that the museum would serve a large body of educational institutions, including "secondary, high-school, college, research, and adult education." Accordingly, Carpenter requested on behalf of the VAS that the men consider submitting resolutions to Senator William F. Parkinson, chair of the Virginia Museum of Science Commission in favor of a state museum of science.<sup>127</sup>

Shannon forwarded the following response to the director of the State Council of Higher Education, the state superintendent of Public Instruction, the members of the Executive Committee of the VAS, the Association of Virginia Colleges, the provost of the University of Virginia, and the chancellor of Mary Washington College:

My personal reservations in part result from the unhappy experiences both of Washington and Lee University and the University of Virginia with museums

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established by private philanthropy, but more importantly from the knowledge of the vastly higher costs of scientific education as opposed to humanistic education. The Commonwealth ought to invest much more than it has done hitherto in scientific education, but not necessarily in an enormously expensive state-wide museum system.<sup>128</sup>

In some sense, Shannon's letter was a cannon shot from an opposition that some of the VAS members had expected. In a letter to Carpenter, James Midyette wrote:

Commissioner [Maurice] Rowe has asked me to comment to you on President Shannon's letter relative to the anticipated position of the Association of Virginia Colleges, in regards to the proposed Virginia Museum of Science. . . . I am not at all surprised at Dr. Shannon's comments, in that it has been apparent that many members of the Academy from State-supported Institutions of Higher Education, have not openly supported the idea of a Museum of Science, apparently for fear that it would compete for public funds that they may need. I personally believe that they are missing the point. . . . First, a basic concept of the Museum of Science is that it be a center for scientific endeavor in which all institutions of higher learning may function. . . . It would, therefore, be supplementary and complementary to the Educational and Research activities of other institutions. Second, . . . it would serve to motivate our citizens, both young and old. . . . I feel that those of us who believe the foregoing to be true should conduct an all out campaign to convince the "Higher Educators" that such an institution will benefit rather than compete with their scientific efforts.<sup>129</sup>

More important, the two presidents, Pitt and Webb, did not share Shannon's view, firmly backing, instead, the science museum project. Lewis Webb, despite Shannon's opposition, garnered support from his colleagues — presidents from private and public institutions — who were members of the VCCP. Webb's leadership and respected judgment positively influenced the future of the museum. Until his death in 1984, Webb spoke highly of the efforts of all involved in establishing the Science Museum of Virginia as a necessary part of the scientific education of Virginia's youth.

With these varying degrees of support, the Symposium on a Museum of Science in Virginia was held in May 1969, at Mary Washington College. After much consideration, the Science Museum Committee had decided to invite experienced representatives from other museums first to speak to the members of the Virginia Academy in a panel format and then to have a quasi-round table discussion in which the membership would have the opportunity to direct questions to the speakers and express their own opinions. With Russell J. Rowlett, Jr., editor of *Chemical Abstracts* at Ohio State University as moderator, the panel consisted of S. N. Hallock, II, Director of the Center for Science and Industry in Columbus Ohio; Mr. Robert C. Haynes, Director, Mathematics and Science Center, Richmond, Virginia; and Dr. Raymond B. Manning, Chairman, Department of Invertebrate Zoology, Smithsonian Institution. The three spoke, respectively, on: "What is a Modern Museum — Its Objectives and Purposes"; "What is the Present Museum Situation in Virginia and What Would be the Impact of a Museum on Education"; and "Branches of a Museum — their Location, Organization, and Goals."<sup>130</sup> Judging from the large and active participation, the symposium was a success for those members of the Virginia Academy of Science who supported the state museum. The difficulties raised at the symposium by those representing the opposition — both within VAS membership and within the general public — were addressed by people with expertise in these areas, not simply by VAS members or Virginians who thought the museum would be a good thing. But despite the symposium, all was not to be clear sailing for the museum proponents, as the issue of funding remained an ever-present difficulty.

Two days later at Council's meeting, Roscoe Hughes spoke of the financial difficulties the State Study Commission on the Virginia Museum of Science was having relative to collecting data. In reviewing the history of the legislation for Council, Hughes indicated the root of the problem: the commission was not funded, except for \$1500 to be used for travel expenses. Hughes wondered if perhaps the VAS would want to contribute private funds. James Midyette moved that \$1000 be used, and after slight modification of his motion, Council passed a motion that:

...the VAS authorize the appropriation of \$1000 for the study of the establishment of a Museum of Science in Virginia; that the Executive Committee be empowered to receive donations to supplement this fund; the manner in

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which it is to be used to be left to the discretion of the Executive Committee.<sup>131</sup>

In the late summer of 1969, before the results of the State's Study Commission formally were issued, the Virginia Academy of Science Committee on a Museum of Science in Virginia offered the following final statement to Council — which forwarded it to the Commission:

1. A Central Museum of Science be established in the Richmond area. The Richmond area center is to develop and administer a statewide system (mobile exhibits, lectures, films, etc).

2. Education should be the major goal of the museum and public participation should be emphasized. Its goals should include: a. Documentation and cataloging of the state's natural resources. b. Interpretation of these natural resources to the citizens of the state.

3. That initial consideration should be given to establishing a planetarium and a botanical garden as starting units.

4. The following Richmond area sites should be given consideration: Maymont-Byrd Park area; State-owned Elko Tract; Broad Street Station area.

5. The major industries in the area should be contacted to ascertain if current exhibits would be available to the museum.

6. The Council of the Virginia Academy of Science enthusiastically endorses the concept of a Museum of Science for Virginia and offers its support and assistance to the Study Committee in implementing this concept.<sup>132</sup>

In mid-October 1969, the Virginia Museum of Science Study Commission handed its report to Governor Godwin. At the very beginning of the thirty-two page report, the commission bestowed accolades upon the VAS, stating:

The Virginia Academy of Science deserves immense credit for vigorously making the concept of the Virginia Science Museum ... during several past administrations as well as the present one, and also for making a substantial financial contribution available to the Study Commission.<sup>133</sup>

Following this acknowledgment, the Commission immediately addressed the purpose and goals of a state science museum:

To deepen our understanding of man and his environment; to promote a knowledge of the scientific method and thus encourage objectivity in everyday affairs of man; to educate citizens of all ages in the concepts and principles of science and that these concepts and principles form the foundation upon which rests our technological society and its economy; to motivate and stimulate young people to seek careers in science; to encourage an understanding of the history of scientific endeavor; to provide special facilities and collections for the study of Virginia's natural resources; to foster a love of nature and a concern for its preservation.

Following these lofty ambitions, the commission set forth its precise recommendations, but not before issuing the proviso that the phrase "Science Museum of Virginia" refers to "the total state museum of science complex and would include regional science museums if and when established." The statement reads:

That a science museum under state control be established that would be known as The Science Museum of Virginia

That The Science Museum of Virginia be one of quality as befits the status and traditions of Virginia

That The Science Museum of Virginia be so organized and administered that it will serve all regions of Virginia

That a basic function of The Science Museum of Virginia be to complement science education at all levels of learning from the elementary school through the university

That The Science Museum of Virginia be financed primarily by the State in the initial stages and increasingly in later stages by private citizens, private foundations, admission charges, and local and federal sources

That The Science Museum of Virginia emphasize the history of science as appropriate, but that a special division of history, encompassing all aspects of that subject, be not included



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That The Science Museum of Virginia be an autonomous institution governed by a board consisting of seven trustees, appointed by the Governor. . .

That first priority be given to the establishment of a museum headquarters, or The Science Museum Center in a centrally located and populous area of the State

That The Science Museum Center coordinate, on the basis of mutualism and upon invitation, science museum activities throughout the State. . .

That The Science Museum Center incorporate the best features of traditional science museums and modern, dynamic science centers

That The Science Museum Center by means of its professional staff, administration, and other resources aid and encourage the establishment of local, regional museums as appropriate wherever local support and funds are available.<sup>134</sup>

The Commission's Study Report did not stop at these recommendations, but continued, comprehensively covering another seven sections. "Part Two" focused on the "Need For a State Science Museum," reviewing topics such as: the science museum's role in educating young and "elder learners," serving the community, and attracting tourists. "Part Three" and "Part Four" concentrated on the services of a quality science museum, such as educational television. "Part Five" listed various examples of support for a Science Museum of Virginia. For instance, the following statement issued by the Council of College Presidents indicates the willingness of the leaders of the state's institutions of higher education to aid the museum in its efforts to reach the public:

Whereas, the Council of College Presidents recognizes the value of such a museum in the education of Virginians at all levels: secondary, college, graduate and adult education, therefore: Be it resolved, that the Council express to the Study Commission its support for such a museum and for the establishment of a coordinated statewide program of related activities.<sup>135</sup>

"Part Six" detailed a possible basic plan for the museum, highlighting the physical sciences division, the botanical sciences division, the natural history division, the industry and technology division, the zoology and limnology division, and the zoological gardens division. "Part

Seven" discussed the selection of a suitable location, while "Part Eight" outlined several tentative sources of revenue. Finally, the recommended enabling legislation was introduced. This took the form of:

[a] Bill To create the Science Museum of Virginia and declare its purposes; to provide for the appointment of the Board of Trustees thereof and to prescribe their powers and duties.<sup>136</sup>

The long-held dream of a museum was moving closer to reality.

As President of the Virginia Academy of Science, Carpenter responded to the excellent news of the report by writing Governor Godwin on November 29, 1969: "I have been authorized to inform you," wrote Carpenter, "that the Council has endorsed the concept of a museum as well as the general content of the report. Your support of this museum in any appropriate way would give great impetus to the growth of science in Virginia."<sup>137</sup>

At the March 1970 Council Meeting, Academy member Austin Grigg announced that the legislature had approved the Science Museum of Virginia and appropriated the requested initiating fund.<sup>138</sup> Two months later at the annual meeting of the VAS, Council met to discuss who might best represent the VAS on the Science Museum of Virginia Board. Unanimously, Council placed Roscoe Hughes at the top of the list and submitted his name to Governor Linwood Holton.<sup>139</sup> At the November Council meeting, Maurice Rowe announced that the Governor had made his decision with respect to the Board of Trustees and had chosen to appoint a nine-member board and had named seven of the nine Trustees of the Planned Science Museum of Virginia. These included two members of the VAS: Roscoe Hughes, a member of the Science Museum Study Commission, and Avery Catlin of the Materials Science Section. Others appointed were: Marianne (Mrs. Jennings T.) Bird of Salem; Cynthia (Mrs. William A.) Stuart, Jr. of Rosedale; and Mary Ross (Mrs. William T.) Reed, Jr. of Manakin-Sabot; Lyons Davidson of Lynchburg; Harold Soldinger of Portsmouth; T. Dale Stewart of McLean; and William J. Vaughan of Virginia Beach, representing widely diverse regions of the Commonwealth: Tidewater to Southwest to Northern Virginia. At the meeting in March 1971, Roscoe Hughes became chair and Albert E. Parr, temporary consultant to the Trustees and former director of the American Museum of Natural History, guided development of "hands-on" science in the museum, in these earliest discussions, by recommending:

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that the Board should not at first look for a Museum director, but instead should look for an educator who could take a sabbatical for six months. The Board must sharpen the definitions of the divisions of the Museum (see Sec. 9-65.3 of the Code of Virginia). The old concept of a museum showing the “real thing” is obsolete — the images of the real thing are [in actuality] shown. Matters concerning the physical sciences have to be exhibited by demonstrations and not by specimens — and this requires a large staff.<sup>140</sup>

The General Assembly appropriated \$66,500 in planning money for the proposed Museum from the 1970–72 biennium to implement the Study Commission’s report, with a portion of the money to be used in hiring an Executive Director. A site for the proposed museum had not yet been selected, and the governor and legislature were reviewing the possibility of several divisions of the museum to revolve around a central location.<sup>141</sup>

In 1971 the Board of Trustees reached several decisions. First, that the museum system should include facilities in three or four population centers around the state, with other outreach centers. They launched a preliminary study into the areas of Lynchburg, Norfolk, and Roanoke. Each museum site would feature something different. For instance, several areas had already been approved by the General Assembly: physical sciences, to include a planetarium and illustrate the “history, concepts, and basic principles of the chief science”; botanical sciences, to educate the Virginia public in the types of Virginia flora; natural history, devoted primarily to Virginia’s natural resources, including paleontological and archaeological artifacts and specimens; industry and technology, to depict the evolution of Virginia’s industry; oceanography and limnology, encompassing an oceanarium and treating Virginia’s aquatic life and environment; and a zoological garden, for the preservation of wildlife viewed as a natural habitat.<sup>142</sup>

Near the close of the year, in November 1971, the Virginia Academy of Science Museum of Science Committee recommended that each section of the Academy be encouraged to read a paper at the next Academy annual meeting that would inform all of its section members about the museum plan and its tie to that particular section and to solicit the formation of advisory groups from each section. In addition, though not unanimously because of three dissenting votes — the Museum of

Science Committee suggested that Council authorize the Executive Committee to approve the expenditure of a portion of the Museum Fund which remained for preparation and printing of an informational brochure on the museum to be distributed by the Academy to its members, civic groups throughout the Commonwealth, and other possible supporters or benefactors of the museum.<sup>143</sup>

Not surprisingly, because of its widespread promotion, the Science Museum received heavy support and, in 1972, the General Assembly appropriated nearly \$140,000 for the 1972–74 biennium. In April of 1972, the SMV's project report was completed, documenting the typical initial facilities, sites, and costs. Also in April, Rae Carpenter was appointed a Trustee of the Science Museum to take the place of Avery Catlin. At a Science Museum Committee meeting in October 1973, Paul Knappenberger, new Assistant Director of the Science Museum, outlined the present plans for the Capitol Museum Building and Headquarters facility, which were to be located on a forty-five acre tract in Byrd Park, Richmond. Carpenter and Hughes discussed with the committee the details of the Board of Trustees and the Foundation of the Science Museum of Virginia, explaining that they still endorsed a regional concept for a state-wide system. Carpenter outlined four ways in which the VAS might provide the Science Museum with aid:

1. Support all Academy Members at each individual's local-level.
2. Formal endorsement by the VAS of the Museum's programs as presently conceived.
3. Cooperation in promoting the local impact of the planned fall-winter State-Wide tour of "Trans-Science" mobile.
4. Individual member assistance in implementing, as called upon in the near future, the anticipated fund-raising effort on behalf of the Science Museum.<sup>144</sup>

In the 1973 Session of the General Assembly, funding limitations caused the legislators to mandate that the development of the Science Museum's physical facilities be limited to one site and authorized the preparation of schematic, preliminary drawings to be completed. In many ways, this decision came as a blow to the high hopes of the VAS. Despite its displeasure with the decision to focus on one site and with the obvious negative implications in mind of the need to prepare preliminary plans without state money, the Virginia Academy of Science

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continued in its support. For instance, in November of 1974, President E.L. Wisman and Rae Carpenter, the latter by then Chair of the Science Museum's Board of Trustees, wrote to every Council member explaining briefly that the Science Museum

...needs our help....In the next few weeks, the Museum needs support expressed to every member of the 1975 General Assembly and we are asking every member of Council to contact each legislator in their locality expressing support for the Museum program and urging that capital outlay funds and increased operating funds be provided. In addition, we ask each member of Council to ask 4 or 5 friends and associates in your community to contact legislators also....<sup>145</sup>

The following January, A.B. Niemeyer, chair of the VAS Committee for the Science Museum of Virginia, discussed ways that the Academy might help to build solid support for the Museum with members of the legislature, including emphasizing that "[l]etters should be written now to the legislators to emphasize the plight of the Museum and to secure backing for this project of the Virginia Academy of Science."<sup>146</sup> The VAS had gotten too far this time to be willing to let the long-awaited science museum disappear. The members' dedication to the project was apparent from the institutional to the personal level. Virginia Academy Fellow Virginia Ellett remembers a very human example of the tenacity with which the VAS — and most notably Hughes — lobbied the General Assembly:

Well, Dr. Hughes, of course, was the backbone of the whole science museum. That man really worked on it. I remember when he was in the hospital one time after an operation. He had me come then and he was dictating things about the museum and telling me what to do. . . . I wrote letters to different people, friends throughout the state and got them to write the Legislature. . . . I was also on television a couple of times, on some of the local talk shows.<sup>147</sup>

One would have thought that such tenacity would have been rewarded. But the limitations of the Commonwealth's budget were to come into play with even more grim implications for the ambitious dreams of the Academy.

In November of 1975, Carpenter reported to the Science Museum of Virginia Committee that there was little chance of government approval of the Museum's capital outlay request. Accordingly, Carpenter said, the Museum's trustees would make a strong appeal for "campaigning money" but would probably eliminate the capital outlay request. Furthermore, intense consideration would be given to using the Broad Street Station to house the Museum.<sup>148</sup> As limiting as the Broad Street Station might seem to be, it was a building, and the Museum at least might make a start there. On March 20, 1976, Carpenter reported that, indeed, the Museum had received permission to use the Broad Street Station and that the State had earmarked \$50,000 for operating funds. Hence, the Museum is "off and running."<sup>149</sup> Carpenter was careful to warn that since there would not be space for botanical gardens at the Broad Street Station, the Board of Trustees would continue to campaign for such an area in the Byrd Park region.<sup>150</sup> In explaining the move to the old train station to Niemeyer in September, while seeking the help of the VAS in continuing to locate funds to allow the museum to fulfill the mission the Academy had originally proposed, Carpenter wrote:

The Science Museum underwent an abrupt change in philosophy last December as a result of the tight state budget and the availability of the Broad Street Station. It took us about four months to reorganize our thinking concerning a future program. It now appears that this program involves using the station with as little renovation and alteration as possible for the near term and with the accumulation of participatory exhibits aimed at the level of the elementary and high-school grades. Physical science will be pursued first. . . . We would request that you discuss in your Committee the feasibility of the VAS providing on a regular basis, scientists from all areas of the state in scientific disciplines to put on programs to the lay public on topics of scientific interest . . .<sup>151</sup>

The Science Museum of Virginia is one of the most visible accomplishments of the Virginia Academy of Science, to be ranked with the Virginia Junior Academy of Science and the publication of *The James River Basin: Past, Present, and Future*. Its creation required action over many years, and the final push that brought the Museum into being required the concerted efforts of a number of players. The vigorous leadership of both Hughes and Carpenter was essential to the birth of the

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Museum, particularly their ability to marshal the VAS members to provide the political clout essential to the project.<sup>152</sup> Working together, the Virginia Academy was able to muster the necessary forces. The Academy's role is one that is easy to forget, now that the Museum is an entity standing largely on its own. But the Science Museum is an achievement of which the Academy should be justly proud. In 1995, for example, approximately 350,000 people of all ages visited the Museum, while eight outreach programs reached another 150,000 people directly. And teacher-training programs sponsored by the Museum encouraged science among countless students. The Museum represented only one of the areas of impact of the VAS; another was demonstrated by its interaction with the State Board of Education over science education in the public schools.

#### *Science Advisory Committee*

By 1961, several members of the Virginia Academy of Science had expressed real concern that the State Board of Education did not include an expert whose primary training and interests rested in a scientific field. Over the next four years, the VAS became increasingly aware that many state agencies whose task area included one or more fields of science lacked an expert in their very targets of investigation. This realization on the part of the Virginia Academy translated into the idea that it might serve the Commonwealth by making available to the governor the expertise of its members.

In late 1965, physicist Tom Joyner of Hampden-Sydney College wrote to Council: "Feeling that the present State Board of Education does not fairly reflect our state community, the Section of Astronomy, Mathematics, and Physics last year requested the Council to resolve to the governor that at least two members be appointed from the scientific community. The Council having failed to act, I was instructed to return this matter to Council [again] for consideration."<sup>153</sup> Finally, at the annual meeting in 1966, the Executive Committee discussed at great length the possibility of creating a VAS "Science Advisory Board" to the governor. Following the Executive Committee's lead, Council decided that a study committee was in order.

In July, 1966, Virginia Academy President Stanley Williams wrote to James Cole, Jr., at the School of General Studies, University of Virginia, asking him to chair a Committee to Study State Science Policy.

Joined by Roscoe Hughes and Tom Joyner, Cole would be responsible for examining the viability of a "Science Advisory Board" to the governor. Perhaps, suggested President Williams, the three men should consult others, such as Senator Lloyd Bird, who might offer an "insider's" perspective on the legislative scene. According to Williams, the committee's goal would be a recommendation to Council on "what should be done." For, as the president pointed out, over the past year the possibility of a Science Advisory Board or an Advisor on Scientific Affairs had been discussed repeatedly, with the idea that the governor might well use a Science Advisory Board or an Advisor on Scientific Affairs, and the VAS might suggest "a plan or a man." Williams was quick to note that "[c]learly, we as an Academy do not wish to be nosy, futile, or foolish. . . . Better to make some small effective move than to sit silent, unless, of course, doing nothing is all that can be done."<sup>154</sup> It appears likely that in the collective memory of the members on Council and the Executive Committee, the friction between the Virginia Academy of Science and the State Board of Education functioned as a reminder of how many pitfalls lay in the way of a satisfactory (to the VAS) resolution of this issue.

At the 1968 annual meeting, Council discussed the latest plans of the Advisory Committee, namely that the Virginia Academy of Science formally offer its services as a Science Advisory Committee to the Governor. Based on communication with state officials, Hughes felt fairly confident that the state administration would be receptive to such a move. Cole said that this approach should be through the State Council of Higher Education. In addition, he suggested that the Virginia Academy of Science should work through Senator Bird, thus affording the VAS the opportunity for a two-pronged approach to the Governor. Harshbarger moved, and Council passed, the motion that all such interactions be handled by the President and the President-elect.<sup>155</sup>

Heeding Council's directive, President Paul Siegel wrote to Senator Bird slightly over one month later. After explaining that numerous times over the past few years the Virginia Academy had discussed the "necessity" of an advisory group on state science to the governor, President Siegel said that an advisory panel would offer "the state an opportunity to utilize available expertise in an advisory capacity for decision-making processes involving science and technology." Indeed, he remarked, to date in Virginia there are not any groups whose sole purpose is to advise on scientific matters. To support his position, Siegel



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declared that scientific advisory committees were prevalent not only in the federal government but also within the states of North Carolina, Maryland, and Kentucky — Virginia's closest neighbors.

These groups provide input on scientific matters to the decision-making units thereby enabling a fuller understanding of such in the development of modern technology.<sup>156</sup>

Two months later, Siegel wrote to Governor Mills Godwin, generally repeating the contents of his letter to Senator Bird, but also adding that he and President-elect Rae Carpenter would be happy to discuss the advisory committee with the governor's office should he show an interest in the proposal.<sup>157</sup>

Godwin's office invited Siegel and Carpenter to meet with Archer L. Yeatts, Jr., Executive Assistant at the governor's office in September, 1968.<sup>158</sup> The meeting went well, and in a letter to Yeatts nine days later, President Siegel reviewed the substance of the meeting, outlining four areas in which a Science Advisory Group might be of use to the state:

1. They [would] provide peer judgment to assist the Executive in appointments to State agencies, boards, and commissions that deal with scientific and technical problems. . . . Examples are: Advisory Council on Virginia Economy, Commission on the Industry and Agriculture, Commission on a State Museum of Science, Radiation Advisory Board, State Board of Education, Commission on Game and Inland Fisheries, Marine Resources Commission, Air Pollution Control Board, Board for the Certification of Architects, Professional Engineers and Land Surveyors, State Water Control Board, Advisory Council on Education Television, Library Board, and Board of Conservation and Economic Development.

2. To provide a source of scientific expertise to the Executive and any state agency or commission for the solution of problems or for planning advice on scientific matters relating to State policy and administration.

3. To assist the Industrial Development Commission in its efforts to attract industry to the State by providing information on the breadth and depth of facilities and talent in public and private educational institutions. This approach is well-demonstrated by the Research Triangle.

4. To identify problems of the scientific community and serve as a vehicle of communication between that community and the Executive and General Assembly to more adequately meet the needs of the State through development of Technical Schools and Community Colleges.<sup>159</sup>

The combination of the meeting with Yeatts and Siegel's letter to Yeatts appeared to the VAS to have met with partial success, for in November 1968, Yeatts replied to Siegel. He had discussed with Governor Godwin the pros and cons of creating a Science Advisory Group, and had "come to the conclusion that to appoint such a group would be a duplication of effort." However, Governor Godwin did feel it appropriate that members of the Virginia Academy of Science sit on the various standing boards and commissions and encouraged the VAS to recommend its qualified members for appointments to these boards: "[I]t would seem appropriate that the Academy advise appropriate state agencies of its willingness to assist by providing technical and scientific help in carrying out their statutory responsibilities."<sup>160</sup> Unfortunately, only the naive would have been taken in by the governor's offer to encourage the VAS to recommend appropriate appointees to the various boards and commissions in question, since all of these appointments were then and remain today entirely political in nature and under the control of each governor, thus reflecting his philosophy and/or patronage needs. It also seems apparent that Godwin was unmoved by the reference to North Carolina's science advisor and the Research Triangle — shortly to become the envy of its neighbors — since he made no immediate movement in the direction of appointing a state science advisor.

Interestingly, the archives of the Virginia Academy contain a letter from January 1969, addressed to the Honorable Governor Mills Godwin by M. Frank Hersman, a staff associate for the Office of the Planning and Policy Studies at the National Science Foundation (NSF) in Washington, D.C. What, inquired Hersman, is the name of the state science advisor with whom he might be working in the future? Hersman continued, explaining that he was responsible for an experimental planning program in the NSF to improve understanding about how state and local governments might make better use of science and technology in developing plans, policies, and programs to deal with public problems. Recently, he said, "[a] number of states have established sci-

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ence advisors to the governor for the purpose of keeping the governor's office and state agencies informed of the implications of new scientific and technological development that either bear on existing governmental programs or, more importantly, those that may not fall within the established missions of existing state agencies."<sup>161</sup> As Executive Assistant to Godwin, Archer Yeatts responded for the Chief Executive:

[T]here is no individual or group that may be considered in the science advisory category. . . . The Virginia Academy of Science is an organization of long and reputable standing, made up of Virginia's leaders in science and technology. . . . it is the Governor's feeling that the present Academy of Science, through its Executive Committee and by working with already established boards and/or commissions, is in a position to advise the governor without the establishment of another advisory organization.

Yeatts listed VAS President Paul Siegel at Virginia Polytechnic Institute as a contact person.<sup>162</sup>

By the end of April, Siegel reported to Yeatts with pleasure that he had received several contacts from Frank Hersman "*re* the name of a science advisor to the Governor and a person whom the National Science Foundation may work with in Virginia . . . ." However, Siegel asked whether or not when he finished his term as Virginia Academy President in May and Carpenter assumed the position "should the role of science correspondent roll over to Carpenter as well?"<sup>163</sup> Yeatts responded that although he had not been able to speak with Governor Godwin, it seemed to him that the most appropriate action would be for the Academy's past president to serve in this capacity since the duties of the past president were somewhat limited and would allow more time for the advisory position.<sup>164</sup>

Obviously Godwin's office was satisfied with Siegel's representation, for at the October Council meeting, Academy President Carpenter announced that the Governor had suddenly appointed Siegel to the position of science advisor to the Governor, especially for counsel on issues relating to the National Science Foundation. The President continued, informing Council that a concerted effort was now underway to have the science advisor appointed to membership on the State's Research and Development Advisory Committee of the State Council of Higher Education (RDAC).<sup>165</sup> The effort was successful, and, in No-

vember, Bruce Miller, an Executive Assistant to the Governor, wrote to Prince B. Woodward of the Council of Higher Education: "May we suggest your consideration for appointment to the Research and Development Committee of the State Council of Higher Education, Paul Siegel."<sup>166</sup> Siegel may have been Godwin's science advisor, but, as is the custom in the Commonwealth, when the administration changed, all such appointments lapse. With the close of Godwin's term, then, the science advisory position became vacant.

The following November, in 1970, Godwin's successor, Governor Linwood Holton, wrote to Maurice Rowe, President of the Virginia Academy of Science, that he was constantly called upon to make decisions which needed expert advice from persons with scientific credentials. "You are quite aware, I am sure, that the Governor of Virginia has had a science advisor, but the past history and activities of that position have lacked needed direction. . . With that in mind, I would like to call on you as President of the Virginia Academy of Science, to seek from the Academy recommendations of three persons who might serve as my science advisor. It is my feeling that the Executive Council of the Virginia Academy of Science should serve as a broad-based, ad hoc committee to the Governor as his science advisor."<sup>167</sup> Immediately, the VAS moved that Siegel, Carpenter, and Edward Turner (President-Elect for 1971), a physicist from Washington and Lee University, be proposed to Holton for his appointment as Science Advisor.<sup>168</sup> In early 1971, the governor's administration interviewed each candidate.

The immediate action of the Virginia Academy of Science to deliver three nominations was not followed by equally prompt action by the state's chief office. At the end of March 1971, a decision from Holton's office was noted only as "expected shortly."<sup>169</sup> Finally, on July 2, 1971, Carpenter wrote to Rowe, saying:

I have not heard anything further on the issue of the science advisor. It seems a shame to have the opportunity for the Academy to have some influence in science matters just disappear, especially after various people had attempted to get such a position over many years. At the very least, I would hope that the position as it existed under Governor Godwin, could be continued...<sup>170</sup>

Very concerned, Rowe responded ten days later to Carpenter that "this is rather embarrassing since I had high hopes that Holton would reach a decision prior to our annual Academy meeting...."<sup>171</sup>

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Almost two years later, Holton still had not contacted the VAS nominees, or, apparently, reached a decision. For Virginia Academy members and other citizens interested in bringing science and technology “experts” to the government, the struggle therefore continued. For example, in December 1972, Dennis Barnes, Associate Provost for Research at the University of Virginia, summed up the previous day’s meeting of the RDAC regarding advisory assistance to the State Government on Science and Technology.<sup>172</sup> First, RDAC had reached consensus on two points: that there was within the state government a “recognized and unfilled need for assistance in coping with public problems which are caused by or are amenable to solutions by science and technology” and second, a great need existed within the new Governor’s cabinet itself for a science advisor. In considering the role of advising, the RDAC envisioned two functions. First of these was the “anticipatory” role, in which advisors would attempt to forecast scientific and technological opportunities and problems in the future. And the second, the “technical assistance” role, involved activities such as technology and information transfer. In the course of discussing the latter role, Barnes offered a particularly revealing glimpse into the decade’s perception of the academic scientist:

The academic community is acknowledged to be a major resource for providing “assistance” to the governor’s cabinet but the present mechanisms for mobilizing interested, qualified, academic expertise are inadequate and unreliable. For a variety of reasons, including previous obligations to and higher priorities for teaching and research, the academician is less likely to contribute effectively to the solution of “brush fire” problems than to the “anticipatory role.”<sup>173</sup>

This stereotypic picture of the academic scientist’s inability to act promptly should have been disheartening to the activist VAS members, many of whom had shown themselves over the years well able to deal with “brush fires” with both vigor and dispatch. In this case, it was not the academic sector as represented by the Virginia Academy of Science that was unable to move with dispatch, for the issue of the science advisor remained hanging fire within the office of the governor for some time.

Two years after RDAC’s meeting advocating the appointment of a science advisor to the Governor’s cabinet and four years after the Vir-

ginia Academy of Science offered its three recommendations to the governor, much remained the same. In writing to Maurice Rowe in March 1974, Carpenter informed him of Jim Midyette's report at the last Council meeting that the "question of a mechanism to provide science advice or expertise to the governor and/or Legislature is still under discussion and that suggestions were welcomed." Carpenter went on to say that in April, after nearly two years of inactivity, the RDAC was going to meet again, and, without doubt, a topic of discussion would be the points laid out by Barnes in his December 1972 memo.<sup>174</sup>

It was not until the May 1974 annual meeting, however, that the VAS attempted any further concrete action towards establishing a science advisor or panel. Council moved to appoint an Ad Hoc Committee to Plan Science Advisory System, chaired by Ertle Thompson of the University of Virginia's School of Education. Since Council did not precisely account for the duties of the new committee, several months after its inception the Ad Hoc Committee issued a memo to Council in which certain ideas and questions were presented as an "attempt to better understand the 'charge' of Council to the committee."<sup>175</sup> In outlining the present status of the committee, its chair Thompson stated:

1. The total field of research problems relative to the Commonwealth of Virginia appears to be ill-defined.
2. There appears to be a lack of consensus of goals and priorities among decision makers.
3. The social, political, and economic conditions appear to dominate the approach to solving most of our problems, yet it is in these areas that we seem to have an inadequate knowledge base to provide acceptable solutions.

Next, Thompson outlined six questions for the committee to consider in its possible role as state science advisor, the three most central being:

1. Is it possible for our committee to identify key individuals from state and local government, industry, colleges and universities, and lay citizenry to provide the necessary input for problem-identification?
2. Is it possible to identify more clearly defined research goals for the Commonwealth of Virginia?
3. Is it possible to assess technological development in Virginia with sufficient precision to permit recom-

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mendations which would assure adequate transfer of newly developed suitable technology to all levels of government, education, and industry?<sup>176</sup>

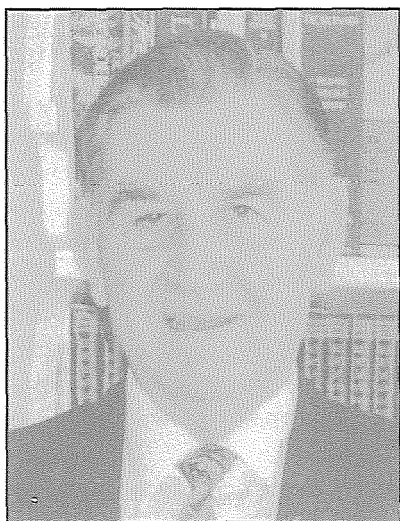
Of these questions, the first is the most illuminating. What can be said about the networking capabilities of a state-wide organization like the VAS if a committee has to ask whether it is “possible” to identify people who would help them discover what the state’s problems are? The third question fits in a similar category, while the second is significant in view of the existence of NASA-Langley in Hampton and some of the high-powered research going on around the Commonwealth, most notably at the University of Virginia and at Virginia Polytechnic Institute and State University. But at least the committee was in place to offer its service, should such service be needed.

While the Governor did not immediately or directly recognize the Ad Hoc Committee, in the Spring of 1975, he did invite its chair, Ertle Thompson, to be a member of the Standards Review Committee of the Water Control Board of the Commonwealth — an indication of an understanding of the advisory function the Virginia Academy could perform.<sup>177</sup> It seems likely that Maurice Rowe, Past-President of the VAS and by then Secretary of Administration and Finance for the governor — hence a member of his inner cabinet — influenced the governor’s decision to appoint Thompson. As Carpenter remarked in an interview:

Maurice Rowe was a key player in trying to get Virginia to have a Science Advisor. He was such a confidant to the governor. . . . He had the ear of the Governor and knew what the problems were. When the problems surfaced, it was natural that Maurice Rowe would have said to the head of the Commonwealth: “Here is an option.”<sup>178</sup>

Fortunately, given the problems that the state would shortly face, the Virginia Academy’s actions did provide the Governor with help he badly needed.

In December 1975, Rowe contacted Thompson, suggesting that the Ad Hoc Committee to Plan Science Advisory System ask Academy President Arthur Burke to write the Governor and offer the service of the Academy in “the area of providing and /or consultation to support the decision-making process. . . .”<sup>179</sup> Rowe’s timing was well-planned, for the disastrous environmental tragedy of the Kepone pollution of the James was beginning to be felt, with the discovery in November of



*Ertle Thompson of the University of Virginia, president of the VAS 1982–1983, served the Academy with distinction in many roles including councilor to the National Association of Academies of Science, chairperson of the Science Advisory Committee, and liaison to the science education community. He was selected as a Fellow in 1979 and received the VJAS Distinguished Service Award in 2000.*

the presence of the chemical in shellfish. Certainly the Governor understood that the expert services of the VAS would be unquestionably valuable, given the fact that he would shortly have to make some difficult and unpopular decisions stemming from the pollution of the James.

The James itself occupied a central position in the Old Dominion, both historically and economically. It was the latter role that was particularly critical in the poisoning by Kepone, for the James was the seedbed for the entire Virginia oyster industry and the heart of the shad fishery. Virginia was renowned for the quality of its oysters, which then represented an important part of the seafood business, and the shad, particularly the roe, were exported to northern markets in significant quantities during the spring spawning run. The James was also a nursery for the famous blue crab, although by the 1970s the marked decline in soft-shell crabs had sent a warning, unheeded, that all might not be well with the mighty James River.

The pollution of the James had been discovered in a very roundabout fashion, despite the fact that the Air Pollution Board, the State Water Control Board, and the Town of Hopewell all had ample evidence that there was trouble stemming from a small, new company, Life Sciences Products. In April of 1974, Life Sciences Products, Inc., a spin-off of Allied Chemical that held the patent on Kepone, began full-scale manufacture of this polychlorinated hydrocarbon pesticide in Hopewell on the James River. Produced in a crude plant that was actu-



ally an abandoned gas station, the substance was manufactured under exceptionally primitive conditions. The magnitude of the crisis was discovered when a sickened employee's bloodwork results were sent by a doctor who suspected Kepone-related poisoning to the Centers for Disease Control (CDC) in Atlanta. Confirming the doctor's suspicions, the CDC contacted the Virginia State Health Department. In July of 1975, under pressure from the Health Department, Life Sciences agreed to shut down production. Subsequent testing of the water column and the sediment showed a high level of contamination in the James River itself. Sampling stations were set up for miles by the State Water Control Board under the authority of the Marine Resources Commission, with the discovery that for fully sixty miles downstream of Hopewell, the water and sediments were heavily contaminated. Estimates of the amount of Kepone in the James ran as high as 100,000 pounds. Examination of finfish and shellfish by both the EPA and VIMS in November, immediately preceding Rowe's letter to Burke, revealed that these animals were contaminated at a level hazardous to the health of people who ate James River seafood. As a consequence of these discoveries, in December, the Governor closed the James to fishing for both shellfish and finfish. It was a decision that caused an uproar in the entire seafood industry, from watermen to packers to the Virginia Seafood Council, many of whom viewed the Kepone problem as a trivial matter blown entirely out of proportion. It was clear the governor needed some support. At the very least, he needed some external validation from Virginians that his decision had been correct.<sup>180</sup>

As soon as VAS President Burke received Rowe's suggestion that the Virginia Academy of Science offer its support, Burke wrote to the Governor. For the first time in the history of the VAS, a governor's administration had issued a direct request to the Virginia Academy for help.<sup>181</sup> Specifically, the Governor asked President Burke to recommend three members of the Virginia Academy of Science to assist him and "render scientific advice regarding Kepone and other pertinent matters of immediate concern." President Burke immediately suggested Herbert McKennis, Professor of Pharmacology, Medical College of Virginia and Virginia Commonwealth University; Kuldip Chopra, Professor of Physics and Geophysical Science, Old Dominion University; and Ertle Thompson, Professor of Science Education, University of Virginia.<sup>182</sup> In explaining his choice of advisors, Burke said:

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The reason I had Thompson is that he's from the field of education and is politically oriented in the field of education toward Science as a chemist. Herb McKennis had been in the Navy Research Department during World War II and was an authority on toxic chemicals and the metabolism of nicotine. Chopra, a one-time Marine, had done some work on the effect of sediments by the flow of currents. So I figured a politician and a research biochemist and a Marine would be it, and they did a fine job.<sup>183</sup>

In March 1976, the three met with Governor Godwin, joined by Rowe, Earl Shiflet, Secretary of Commerce and Resources, and Otis L. Brown, Secretary of Human Affairs. The Governor was enthusiastic, expressing enormous interest in counsel from the membership of the Virginia Academy of Science. Indeed, his enthusiasm was not unwarranted, for, by March, the watermen's instinct for public relations had made itself felt, particularly on television. Footage of distressed and outraged watermen, their picturesque, homemade, wooden dead-rise workboats, and the serene James itself appeared on nearly every local station in Virginia. Immediate discussion with the Governor and the group focused on the various "policies, rules, regulations, and standards" controlling the Water Control Board, Board of Health, and the Board of Conservation and Economic Development. In addition, the Kepone disaster — the underlying reason behind the existence of the three-person Academy panel — was discussed for the first time.

According to Rowe, the panel was instrumental in aiding the Governor during an extremely controversial situation in which a clearly defined solution did not exist. Data from different labs analyzing the same samples of water, sediment, finfish, and shellfish gave conflicting results. No one was entirely sure what the effects of Kepone in small amounts might be on human beings — although the experience of the Life Sciences employees made abundantly clear what damage very great exposure could cause. It was also clear how much political damage Kepone could cause, which was considerable. The new panel:

...gave guidance to those in authority positions, like health people ... they enabled the Governor to make decisions that were based upon the best science input the state could muster. ...they prepared press releases in anticipation of all possible reactions and results. ...<sup>184</sup>

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In February of 1976 when Governor Godwin sent a proposal to the state to inventory all toxic substances manufactured in the state and to provide for both civil and criminal penalties for violation of public health requirements, it was with the Panel's input. At the same time, the Governor's Office designated Ertle Thompson as "Science Advisor to the Executive Branch of Government" to represent the Commonwealth of Virginia at the National Governor's Council on Science and Technology to meet later that spring.<sup>185</sup>

With the help of the Virginia Academy of Science, the Commonwealth and its Governor managed to weather the greatest environmental crisis to occur in Virginia's history. It is a telling commentary on the nature of the political scene that it took an event of this magnitude to bring Governor Godwin to call into the Richmond arena the very people whose advice would have been the most helpful to him even earlier. In fact, had Maurice Rowe not been so close to Governor Godwin, it is likely that Godwin would never have asked for the help of the VAS. Both the presence of Rowe, then, and the magnitude of the problem made it possible for the Virginia Academy to offer its support. At base, perhaps, the difficulty arose from the fact that the worlds of politics and of science are separated widely. The VAS — while it continued to have vigorous leadership during this period — lacked the full enrollment of the high-prestige scientists whose presence on the membership rolls might have given the scientific organization a higher visibility within the political scene. Then too, the loose organization of the Virginia Academy of Science and its lack of an organized, political action group rendered it ineffective over the long run. For Virginia, which only after the death of Harry Flood Byrd turned away from its emphasis on rural values, the coming of the age of high technology and the importance of science to the economic development of the Commonwealth were simply not recognized. In this context, Ertle Thompson's remark — "the social, political, and economic conditions appear to dominate the approach to solving most of our problems" — describes an attitude that all of the efforts of the VAS could not overturn.

#### *Reflections: 1963–1976*

The Virginia Academy remained true to its self-image throughout this period, sometimes with striking results. The Virginia Junior Academy of Science, for example, represented one of the great successes of

the VAS and is the best example of its outreach philosophy. On the other hand, the inability of the Virginia Academy of Science to see itself in terms of the changing context of scientific professionalism — one in which participation in national associations and forums became both accessible to the majority of Virginia scientists and necessary for professional advancement — led to problems. Such difficulties ranged from the disappointing state of the *Virginia Journal of Science* to the decline in membership among the very senior scientists who could have offered support to the state-based group that was actively recruiting young people into the sciences.

Perhaps the most important area of activity — that of interaction with the dominant figures on the Virginia political scene — was one with decidedly mixed results. The Virginia Academy of Science may in no way be faulted for what would shortly reveal itself as Virginia's failure to see the shape of the new technological age that was dawning. The state was well-placed to take the active role that both its research-oriented institutions of higher learning and the presence of one of the large national laboratories, such as the Continuous Electron Beam Accelerator Facility (now known as The Jefferson National Laboratory), should have brought about. That it failed to do so is in no small measure one result of the failure of the state government to enter into a partnership with its local scientists. The Virginia Academy certainly did its best to offer its services to the Commonwealth. What caused the failure of any significant union was a combination of short-sightedness on the part of politicians, not excluding the governors, and turf battles. In the latter, the obvious unwillingness of the State Board of Education to allow faculty members from higher education to have any say in the science offerings within the public schools established a climate that was difficult to change. And the position against the Science Museum taken by President Shannon of the University of Virginia and his supporters led to internal division within the VAS itself which did the organization no good. Even when Governor Godwin called in an advisory committee, he did so with his back against the wall because of the extremely bad press that Kepone was causing the entire state. He needed more than advice. He needed home-grown experts to lean on when his unpopular but necessary decisions were attacked by Virginians.

## Endnotes

- <sup>1</sup> For an excellent overview of this early period, see Andrew Buni, *The Negro in Virginia Politics, 1902-1965* (Charlottesville: University of Virginia Press, 1967).
- <sup>2</sup> Ronald Heinemann, "Virginia in the Twentieth Century: Recent Interpretations," *The Virginia Magazine of History and Biography* 94 (April, 1986), p. 131.
- <sup>3</sup> Emily J. Salmon and Edward D.C. Cambell, Jr., eds., *The Hornbook of Virginia History* (Richmond: The Library of Virginia, 1994), p. 91.
- <sup>4</sup> For an overview of this period see Rubin, *Virginia: A History*.
- <sup>5</sup> Heinemann, "Virginia in the Twentieth Century."
- <sup>6</sup> Younger and Moore, *The Governors of Virginia, 1860-1978*, p. 365; see also Albertis S. Harrison, Jr., *Commonwealth of Virginia Inaugural Address and Addresses Delivered to the General Assembly of Virginia* (Richmond: Commonwealth of Virginia, 1966).
- <sup>7</sup> Younger and Moore, *The Governors of Virginia, 1860-1978*, pp. 370-71.
- <sup>8</sup> See M. Carl Andrews, *No Higher Honor: The Story of Mills E. Godwin, Jr.* (Richmond, 1970).
- <sup>9</sup> For an overview, see Ralph Eisenberg, "Virginia: The Emergence of Two-Party Politics," in William C. Havard, ed., *The Changing Politics of the South* (Baton Rouge, La., 1972).
- <sup>10</sup> Younger and Moore, *The Governors of Virginia, 1860-1978*, p. 393.
- <sup>11</sup> *Ibid.*, p. 397.
- <sup>12</sup> *Virginia Journal of Science* 15 (1964), pp. 1-5.
- <sup>13</sup> *Ibid.*, pp. 159-61.
- <sup>14</sup> *Ibid.*, p. 227.
- <sup>15</sup> Other dedicated and vibrant members of the VAS who died during the early sixties: On July 17, 1967, Guy Winston Horsley (1905-1967), surgeon and long-time member of the VAS, died. He was the son of J. Shelton Horsley. His strongest contribution was his participation on the Finance and Endowment Committee, of which he was a member for nineteen years — 1948 until his death. On March 26, 1969, Ladley Husted of the University of Virginia died (1906-1969). William George Guy (1899-1969), Professor and Head of Chemistry at William and Mary, died on June 14, 1969. Less than two months later, Foley Smith died, on August 9. Smith had served as chemist with the Division of Chemistry of the Virginia Alcoholic Beverage Control Board for thirty-five years. Foley Smith left the VAS a bequest of \$8000.
- <sup>16</sup> *Virginia Journal of Science* 17 (1966), pp. 1-2.
- <sup>17</sup> "Minutes of Council," May 8, 1975. Special Collections, Virginia Tech.
- <sup>18</sup> *Virginia Journal of Science* 17 (1966), pp. 220, 226-7.
- <sup>19</sup> Roscoe Hughes to Virginia Academy of Science Council, September 25, 1965. Special Collections, Virginia Tech.
- <sup>20</sup> *Virginia Journal of Science* 17 (1966), p. 219.
- <sup>21</sup> *Virginia Journal of Science* 21 (1970), p. 100.
- <sup>22</sup> The influx of young botanists to Virginia not only precipitated a new Botany Section, but also revitalized the Flora Committee. In the Fall of 1968, the Flora Committee took on the large task of revising the vascular plant groups. Six

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years later, with the "revisions" nearly finished, chair Peter Mazzeo contacted Perry Holt, chair of the Publications Committee, to review tentative plans for the publication of an *Atlas of Virginia Flora* (see "Minutes of Council," November 2, 1974). By January 1976, the first part of the *Atlas* was off to press, with a plan to print 1000 copies. At an estimated cost of \$2000, the Flora Committee decided to handle all distribution, selling them at a price to recover the publication's costs that were advanced to them by Council. See "Minutes of Council," November 9, 1975. Special Collections, Virginia Tech.

<sup>23</sup> Roscoe Hughes to S.S. Obenshain, February 16, 1965. Special Collections, Virginia Tech.

<sup>24</sup> "Minutes of Council," September 12, 1970. Special Collections, Virginia Tech.

<sup>25</sup> Franklin Flint to Dale Ulrich, June 13, 1974. Special Collections, Virginia Tech.

<sup>26</sup> "Minutes of Council," November 9, 1975. Special Collections, Virginia Tech.

<sup>27</sup> Arthur Burke to Charlotte Webb, Interview, April 11, 1995.

<sup>28</sup> *Virginia Journal of Science* 22 (1971), pp. 23-25; Rules and Procedures: 1) A Fellow must be nominated by at least three members of the Academy. The Academy Council must approve each "Fellow" by a majority vote, and will establish the limiting date for receipt of nominations. It will be the usual procedure to announce new Fellows at an annual meeting. 2) No more than twenty-five fellowships will be approved the first year. After the first year no more than one-half of one per cent of the total active membership shall be selected in any one year. The limiting number of Fellows shall not exceed five percent of the total active membership of the Academy.

<sup>29</sup> *Virginia Journal of Science* 21 (1970), p. 100. Membership in the "Fellows" was and continues to be a great honor. At the Annual Meeting in 1976, E.L. Wisman announced that the Fellows would begin an annual breakfast meeting as part of their participation in the annual meeting. Fellowship notwithstanding, the event would perform a useful service to the VAS by reviewing the activities of the Academy and recommending courses of action which might be followed.

<sup>30</sup> See Midgette, *To Foster the Spirit of Professionalism*, for a discussion of this problem as it pertains to southern state academies of science.

<sup>31</sup> Concerning the matter of state financial support, a number of other State Academies received more than Virginia. On November 17, 1969, Robert W. Hanson, Executive Secretary-Treasurer of the Iowa Academy of Science, wrote to Rodney C. Berry, Executive Secretary of the Virginia Academy of Science, about the matter. He indicated that the Iowa Academy was attempting to change the nature of their appropriation from the legislature to a direct appropriation rather than support only for the printing of the proceedings, which amounted to about \$8000 annually. He was interested to know what the other academies did. Berry responded on November 24, that the VAS received no direct support from Virginia. The *Journal* got about \$5000 from subscriptions and ads and another \$8000 came from the general fund of the VAS. For the following year, Berry stated, it looked as if the operating budget for the VAS would be about \$35,000, with the Research Trust Fund standing at about \$50,000. Berry also informed Hanson that sufficient funds were always a problem and that on October 20, 1967, Coun-

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cil had authorized a Fund Raising Committee. Letters in Special Collections, Virginia Tech.

<sup>32</sup> Roscoe D. Hughes to Walter Flory, January 14, 1966. Special Collections, Virginia Tech. According to Hughes, the initial responsibilities of the Publications Committee were threefold: 1) Study the publication problems of the Academy and arrive at an over-all, long-range policy. 2) Determine whether or not the *VJS* was satisfactory as it presently stood. Should it be published more often, e.g., monthly or bimonthly? Would a "newsletter" published at even more frequent intervals satisfy VAS needs better than a journal? . . . The committee would also recommend editors and staff for the *Journal*. 3) The Publications Committee should also consider finances for all publications.

<sup>33</sup> "Minutes of Council," October 18, 1964. Special Collections, Virginia Tech.

<sup>34</sup> *Virginia Journal of Science* 16 (1965), p. 248.

<sup>35</sup> *Virginia Journal of Science* 17 (1966), p. 227.

<sup>36</sup> Arthur Burke to Charlotte Webb, Interview, Richmond, Virginia, April 11, 1995.

<sup>37</sup> Lynn Abbott to Charlotte Webb, Interview, Richmond, Virginia, March 13, 1995.

<sup>38</sup> Lynn Abbott to Charlotte Webb, Interview, Richmond, Virginia, April 13, 1995.

<sup>39</sup> "Editors Report," March 20, 1976. Special Collections, Virginia Tech.

<sup>40</sup> "Editors Report," March 20, 1975. Special Collections, Virginia Tech.

<sup>41</sup> *Ibid.*

<sup>42</sup> "Minutes of Council," April 5, 1964. Special Collections, Virginia Tech.

<sup>43</sup> "Minutes of Council," October 18, 1964. Special Collections, Virginia Tech.

<sup>44</sup> "Minutes of Council," November 2, 1967. Special Collections, Virginia Tech.

<sup>45</sup> *Ibid.*

<sup>46</sup> Walter Flory to D. Rae Carpenter, December 1, 1967. Special Collections, Virginia Tech.

<sup>47</sup> Walter Flory to J.T. Baldwin, January 20, 1968. Special Collections, Virginia Tech.

<sup>48</sup> J.T. Baldwin, Jr. to Walter Flory, Jr., February 15, 1968. Special Collections, Virginia Tech.

<sup>49</sup> Walter Flory to Members of the Publications Committee, February 22, 1968. Special Collections, Virginia Tech.

<sup>50</sup> "Minutes of Council," March 24, 1968. Special Collections, Virginia Tech.

<sup>51</sup> D. Rae Carpenter to J.T. Baldwin, March 25, 1968. Special Collections, Virginia Tech.

<sup>52</sup> Walter Flory to J.T. Baldwin, April 12, 1968. Special Collections, Virginia Tech.

<sup>53</sup> J.T. Baldwin to D. Rae Carpenter, Jr., April 18, 1968. Special Collections, Virginia Tech.

<sup>54</sup> *Ibid.*

<sup>55</sup> D. Rae Carpenter to Walter Flory, April 19, 1968. Special Collections, Virginia Tech.

<sup>56</sup> James Midyette, Jr. to D. Rae Carpenter, Jr., May 17, 1968. Special Collections, Virginia Tech.

<sup>57</sup> "Minutes of Council," May 8, 1969. Special Collections, Virginia Tech.

<sup>58</sup> *Virginia Journal of Science* 20 (1969), pp. 158-173.

<sup>59</sup> *Virginia Journal of Science* 21 (1970), pp. 81-83; and 41-46.

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- <sup>60</sup> Alexander Crosby Brown, *Juniper Waterway: A History of the Albemarle and Chesapeake Canal* (Charlottesville: University of Virginia Press, 1980).
- <sup>61</sup> "Minutes of Council," October 28, 1973. Special Collections, Virginia Tech.
- <sup>62</sup> *Ibid.*
- <sup>63</sup> Perry Holt to Richard Hoffman, July 23, 1974. Special Collections, Virginia Tech.
- <sup>64</sup> Perry Holt to Paul Kirk, August 20, 1974. Special Collections, Virginia Tech.
- <sup>65</sup> Paul Kirk to Perry Holt, September 17, 1974. Special Collections, Virginia Tech.
- <sup>66</sup> "Minutes of Council," November 2, 1974. Special Collections, Virginia Tech.
- <sup>67</sup> Paul Kirk to Robert Ake, Fred Benfield, and Art Buikema, January 8, 1976. Special Collections, Virginia Tech.
- <sup>68</sup> *Ibid.*
- <sup>69</sup> "Minutes of Council," March 20, 1976. Special Collections, Virginia Tech.
- <sup>70</sup> *Ibid.*
- <sup>71</sup> Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin Company, 1962).
- <sup>72</sup> For a comprehensive overview of this period, see Kirkpatrick Sale, *The Green Revolution: The American Environmental Movement, 1962–1992* (New York: Hill and Wang, 1993).
- <sup>73</sup> William Jennings Hargis, Jr., "Research, Education, and 'Proper Extension Work': The First 50 Years of the Virginia Institute of Marine Science" (Williamsburg: College of William and Mary, 1990), p. 2.
- <sup>74</sup> VIMS returned to the control of the College of William and Mary in 1979 as a result of funding difficulties.
- <sup>75</sup> "Minutes of Council," March 28, 1971. Special Collections, Virginia Tech.
- <sup>76</sup> Governor Linwood Holton, "Executive Order Number Eight," September 16, 1970. Special Collections, Virginia Tech.
- <sup>77</sup> To Members of the Virginia Academy of Science from The Committee on Conservation and Natural Resources, February 2, 1971. Special Collections, Virginia Tech.
- <sup>78</sup> *Virginia Journal of Science* 23 (1972), p. 93.
- <sup>79</sup> Following Roscoe Hughes' death in 1976, President Burke announced that "by action of Council on May 12, 1976, the Ecology Fund was designated the Roscoe D. Hughes Ecology Fund in Memory of Dr. Hughes." Special Collections, Virginia Tech.
- <sup>80</sup> Fred Milhiser to Science Education in Virginia Committee, October 8, 1964. Special Collections, Virginia Tech.
- <sup>81</sup> "Minutes of Council," October 18, 1964. Special Collections, Virginia Tech.
- <sup>82</sup> John C. Forbes to Members of the Science Education in Virginia Committee, January 12, 1965. Special Collections, Virginia Tech.
- <sup>83</sup> "Minutes of Council," May 8, 1965. Special Collections, Virginia Tech.
- <sup>84</sup> *Ibid.*
- <sup>85</sup> "Minutes of Council," November 2, 1974. Special Collections, Virginia Tech.
- <sup>86</sup> "Minutes of Council," March 4, 1976. Special Collections, Virginia Tech.
- <sup>87</sup> "Minutes of Council," May 8, 1965. Special Collections, Virginia Tech.
- <sup>88</sup> Frank Kizer to Charlotte Webb, Interview, Lancaster, Virginia, April 18, 1995.
- <sup>89</sup> "Minutes of Council," October 25, 1969. Special Collections, Virginia Tech.
- <sup>90</sup> *Virginia Journal of Science* 16 (1965), pp. 270, 277.



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- <sup>91</sup> *Ibid.*, pp. 275-76.
- <sup>92</sup> "Minutes of the Academy Conference," March 24, 1968. Special Collections, Virginia Tech.
- <sup>93</sup> "Minutes of Council," May 10, 1968. Special Collections, Virginia Tech.
- <sup>94</sup> "Minutes of Council," September 12, 1968; and "Minutes of Council," October 27, 1968. Special Collections, Virginia Tech.
- <sup>95</sup> D. Rae Carpenter to Council on the Visiting Scientists Program, 1968-1969, May 1, 1969. Special Collections, Virginia Tech. Over the next few years, Alex Clarke and then Dale Ulrich of Bridgewater College ran the program.
- <sup>96</sup> "Minutes of Council," May 8, 1975. Special Collections, Virginia Tech.
- <sup>97</sup> "Minutes of Council," May, 1971. Special Collections, Virginia Tech.
- <sup>98</sup> Vera Remsburg, "VAS — Its Beginning and Development from 1941-1973," presentation delivered at the 50th Anniversary of the VJAS, May 2, 1973. Special Collections, Virginia Tech.
- <sup>99</sup> *Virginia Journal of Science* 19 (1968), pp. 163-4.
- <sup>100</sup> *Virginia Journal of Science* 22 (1970), pp. 74-75.
- <sup>101</sup> E. L. Wisman to Charlotte Webb, Interview, Blacksburg, Virginia, March 20, 1995.
- <sup>102</sup> "Minutes of Council," March 20, 1976. Special Collections, Virginia Tech.
- <sup>103</sup> "Minutes of Council," May 12, 1976. Special Collections, Virginia Tech.
- <sup>104</sup> "Minutes of Council," May 14, 1976. Special Collections, Virginia Tech.
- <sup>105</sup> The following is a brief summary of the enormous effort of the Virginia Academy of Science to establish the Science Museum of Virginia. It is not by any means comprehensive, as such an account should itself be the subject of a book-length treatment. Instead, this summary is an attempt to both highlight the vital stages of the endeavor and to convey the deeply held conviction of most members of the VAS that this Museum was/is necessary for the continued "scientific health" of Virginia. Accordingly, each Academy member who participated in the Science Museum project is not mentioned. This should not in any way be viewed as an attempt to write individuals out of the history, but rather as the unfortunate result of trying to present a macro rather than a micro account.
- <sup>106</sup> "Minutes of Council," May 10, 1963. Special Collections, Virginia Tech.
- <sup>107</sup> "Report of the Virginia Museum of Science Study Commission," 1969, p. 6. Special Collections, Virginia Tech. The bill was in the form of Senate Joint Resolution No. 26 and House Joint Resolution No. 76.
- <sup>108</sup> "Minutes of Council," April 5, 1964. Special Collections, Virginia Tech.
- <sup>109</sup> K.P. Bovard to State Senator George Aldhizer, December 26, 1967. Special Collections, Virginia Tech.
- <sup>110</sup> "Report of the Virginia Museum of Science Study Commission," 1969, p. 6. Special Collections, Virginia Tech.
- <sup>111</sup> "Minutes of Council," May 7, 1964. Special Collections, Virginia Tech.
- <sup>112</sup> "Minutes of the Long Range Planning Committee," October 4, 1964. Special Collections, Virginia Tech.
- <sup>113</sup> "Science Museum Resolution," May 4, 1967. Special Collections, Virginia Tech.
- <sup>114</sup> "Minutes of Council," October 22, 1967. Special Collections, Virginia Tech.

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- <sup>115</sup> James Cole to Miscellaneous Group, December 15, 1967. Special Collections, Virginia Tech.
- <sup>116</sup> "Committee Amendment in the Nature of a Substitute for House Bill No. 524," February 29, 1968. Special Collections, Virginia Tech.
- <sup>117</sup> "Minutes of Council," September 12, 1968. Special Collections, Virginia Tech.
- <sup>118</sup> Horton H. Hobbs, Jr. to Paul Siegel, July 30, 1968. Special Collections, Virginia Tech.
- <sup>119</sup> The following members and guests were present at this first meeting: Perry Holt, Biology Department, Virginia Polytechnic Institute; Gwynn Ramsey, Lynchburg College; Susie Floyd, Newport News High School; Horton Hobbs, Jr., United States National Museum; Senator Lloyd C. Bird; D. Rae Carpenter, President-elect of the VAS and of Virginia Military Institute; E.S. Harlow, Chairman, The American Tobacco Company; Rodney Berry, Executive Secretary of the VAS; James Midyette, Virginia Department of Agriculture; Roscoe Hughes, Vice-Chairman, State Museum of Science Commission; Harry L. Halloway, Jr., Roanoke College; Colonel Howard McCord, State Archaeologist and Advisor to the Committee; Blanton Bruner, The American Tobacco Company; Randolph Gladding, The American Tobacco Company. Listed in "Minutes of Meeting of the Science Museum Committee," October 9, 1968. Special Collections, Virginia Tech.
- <sup>120</sup> "Minutes of Meeting of the Science Museum Committee," October 9, 1968.
- <sup>121</sup> Ed Harlow to Paul Siegel, November 15, 1968. Special Collections, Virginia Tech.
- <sup>122</sup> Perry Holt to Council, December 10, 1968. Special Collections, Virginia Tech.
- <sup>123</sup> Ibid.
- <sup>124</sup> D. Rae Carpenter to Edward Harlow, December 12, 1968. Special Collections, Virginia Tech.
- <sup>125</sup> "Proceedings of the Hearing on a State Science Musuem," January 8, 1969. Special Collections, Virginia Tech.
- <sup>126</sup> "Minutes of Meeting, Science Museum Committee," February 19, 1969. Special Collections, Virginia Tech.
- <sup>127</sup> D. Rae Carpenter to Malcom Pitt, March 12, 1969; and Carpenter to Lewis Webb, Jr. and Edgar Shannon, February 26, 1969. Special Collections, Virginia Tech.
- <sup>128</sup> Edgar Shannon to D. Rae Carpenter, Jr., April 8, 1969. Special Collections, Virginia Tech.
- <sup>129</sup> James Midyette to D. Rae Carpenter, April 29, 1969. Special Collections, Virginia Tech.
- <sup>130</sup> "Symposium on a Museum of Science in Virginia," Mary Washington College, May 8, 1969. Special Collections, Virginia Tech.
- <sup>131</sup> "Minutes of Council," May 10, 1969. Special Collections, Virginia Tech.
- <sup>132</sup> "Report of the Virginia Academy of Science Ad Hoc Committee on A Museum of Science in Virginia," 1969. Special Collections, Virginia Tech.
- <sup>133</sup> "Report of the Virginia Museum of Science Study Commission, 1969," October 15, 1969, p. 2. Special Collections, Virginia Tech.
- <sup>134</sup> Ibid., p. 19.
- <sup>135</sup> Ibid.
- <sup>136</sup> Ibid.

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- <sup>137</sup> D. Rae Carpenter, Jr. to Governor Mills Godwin, November 29, 1969. Special Collections, Virginia Tech.
- <sup>138</sup> *Virginia Journal of Science*, 21 (1970), p. 70.
- <sup>139</sup> *Ibid.*, p. 94.
- <sup>140</sup> Minutes of the Virginia Science Museum Bolard of Trustees meeting, March 1971.
- <sup>141</sup> *Virginia Journal of Science* 22 (1971), pp. 19, 30.
- <sup>142</sup> *Ibid.*, p. 76.
- <sup>143</sup> "Minutes of the Executive Committee," September 26, 1971. Special Collections, Virginia Tech.
- <sup>144</sup> "Minutes, Ad Hoc Committee on Science Museum of Virginia," October 21, 1973. Special Collections, Virginia Tech.
- <sup>145</sup> E. L. Wisman and Rae Carpenter to Council, November 20 1974. Special Collections, Virginia Tech.
- <sup>146</sup> A. B. Niemeyer, Jr. to Science Museum Committee, January 22, 1975. Special Collections, Virginia Tech.
- <sup>147</sup> Virginia Ellett to Charlotte Webb, Interview, Richmond, Virginia, April 4, 1995.
- <sup>148</sup> "Minutes of Council," November 9, 1975. Special Collections, Virginia Tech.
- <sup>149</sup> Academy member and Cabinet member Maurice Rowe was instrumental in securing the Broad Street Station for the Science Museum of Virginia. As he remembers in an interview with Charlotte Webb on April 4, 1995, in Richmond, Virginia: "Well, there was a lot of interest in trying to locate a place for the science museum, and several locations were suggested, one being Maymount and I think one might have been over at the Botanical Gardens, but I can recall quite vividly that Roscoe Hughes was very much opposed to that and was very much interested in finding some location that would be central and sort of stand on its own and be recognized as a science museum rather than being part of some other conglomerate. So, at the time, I being in government and basically responsible for state properties and so on and so forth and Chairman of the Public Buildings Commission, they solicited my interest and I likewise solicited the Governor's interest in the possibility of the Science Museum being located at the Old Broad Street Station. . . ."
- <sup>150</sup> "Minutes of Council," March 20, 1976. Special Collections, Virginia Tech.
- <sup>151</sup> D. Rae Carpenter to Bill Niemeyer, Septmeber 21, 1976. Special Collections, Virginia Tech.
- <sup>152</sup> The Science Musuem of Virginia heralds Roscoe Hughes as its founder. To honor his dedication and service to the Museum, the Roscoe Durall Hughes Memorial Placque was dedicated on August 11, 1989, at the Science Museum of Virginia. In the dedication address given by then-VAS President Michael Bass, he closed by stating: "Roscoe Durall Hughes has honored us by having this great, big vision of a Virginia science musuem, the ability to develop, nurture, and create it into existence. Especially, we are grateful to Roscoe for developing in each of us such a great feeling of accomplishment and pride in this our Virginia Science Musuem." Address printed in *Virginia Journal of Science* 40 (1989), pp. 242-43.
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- <sup>153</sup> Tom Joyner to Members of Council, November 1, 1965. Special Collections, Virginia Tech.
- <sup>154</sup> Stanley Williams to James W. Cole, Jr., July 12, 1966. Special Collections, Virginia Tech. It is interesting that in a handwritten note dated 12 October 1967 at the top of the letter, Rae Carpenter wrote to Cole: "I have heard nothing of this and I am quite interested. I know Joyner first brought this up at a Physics Section meeting about five years ago. How about continuing this for 1967-68?"
- <sup>155</sup> "Minutes of Council," May 10, 1968. Special Collections, Virginia Tech.
- <sup>156</sup> Paul B. Siegel to Senator L.C. Bird, June 24, 1968. Special Collections, Virginia Tech.
- <sup>157</sup> Paul B. Siegel to Honorable Governor Mills Godwin, August 19, 1968. Special Collections, Virginia Tech.
- <sup>158</sup> Maurice B. Rowe to D. Rae Carpenter, Jr. and Paul B. Siegel, September 26, 1968. Special Collections, Virginia Tech.
- <sup>159</sup> Paul B. Siegel to Archer L. Yeatts, October 8, 1968. Special Collections, Virginia Tech.
- <sup>160</sup> Archer L. Yeatts, Jr. to Paul Siegel, November 12, 1968. Special Collections, Virginia Tech.
- <sup>161</sup> M. Frank Hersman to Honorable Mills E. Godwin, Jr., January 2, 1969. Special Collections, Virginia Tech.
- <sup>162</sup> Archer L. Yeatts, Jr. to M. Frank Hersman, January 8, 1969. Special Collections, Virginia Tech.
- <sup>163</sup> Paul B. Siegel to Archer L. Yeatts, April 29, 1969. Special Collections, Virginia Tech.
- <sup>164</sup> Archer L. Yeatts to Paul B. Siegel, May 6, 1969. Special Collections, Virginia Tech.
- <sup>165</sup> *Virginia Journal of Science* 21 (1970), p. 24.
- <sup>166</sup> Bruce Miller to Prince B. Woodward, November 12, 1969. Special Collections, Virginia Tech.
- <sup>167</sup> Governor Linwood Holton to Maurice Rowe, November 2, 1970. Special Collections, Virginia Tech.
- <sup>168</sup> "Minutes of Council," 1970-71. Special Collections, Virginia Tech.
- <sup>169</sup> "Minutes of Council," March 28, 1971. Special Collections, Virginia Tech.
- <sup>170</sup> D. Rae Carpenter to Maurice B. Rowe, July 2, 1971. Special Collections, Virginia Tech.
- <sup>171</sup> Maurice B. Rowe to D. Rae Carpenter, July 12, 1971. Special Collections, Virginia Tech.
- <sup>172</sup> Dennis W. Barnes to James Midyette, Department of Agriculture and Commerce; Maurice B. Rowe, Secretary of Commerce and Resources; Earl J. Shiflet, Secretary of Education; Clifford Adams, Old Dominion University; D. Rae Carpenter, Virginia Military Institute; Warren Heeman, College of William and Mary; Randall M. Robertson, Virginia Polytechnic Institute and State University; Daniel T. Watts, Virginia Commonwealth University; Daniel E. Marvin, State Council of Higher Education for Virginia; Edward F. Turner, Jr., Washington and Lee University. Special Collections, Virginia Tech.

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- <sup>173</sup> Dennis Barnes to aforementioned group, December 14, 1972. Special Collections, Virginia Tech.
- <sup>174</sup> D. Rae Carpenter, Jr. to Maurice Rowe, March 18, 1974. Special Collections, Virginia Tech.
- <sup>175</sup> Ertle Thompson to the Virginia Academy of Science Council, November 1, 1974. Special Collections, Virginia Tech.
- <sup>176</sup> Ibid.
- <sup>177</sup> "Minutes of Council," May 7, 1975; See also the full "Report of the Ad Hoc Committee to Plan Science Advisory System," May 8, 1975. Of this committee, Ertle Thompson, Hunter D. Hamlett, P. Howard Massey, James Midyette, and Maurice B. Rowe submitted the report. Special Collections, Virginia Tech.
- <sup>178</sup> D. Rae Carpenter to Charlotte Webb, Interview, Newport News, Virginia, June 13, 1995.
- <sup>179</sup> "Minutes of Council," November 9, 1975. Special Collections, Virginia Tech.
- <sup>180</sup> For an in-depth analysis of this crisis, see George and Jane Webb, "Kepone: The Poisoning of the James River" (Smithfield: *Smithfield Times*, 1978-79). Edited by John Edwards, this analysis was written as part of a public service science residency funded by the National Science Foundation.
- <sup>181</sup> In an interview with Charlotte Webb on April 4, 1995 in Richmond, Rowe explains that going to the Academy was the wise thing to do since those chosen as advisors would represent first and foremost the Virginia Academy of Science and second their professional institutions. Thus, no one university or college could cry favoritism.
- <sup>182</sup> "Report of the Ad Hoc Committee to Plan Science Advisory System," May 13, 1976. Special Collections, Virginia Tech.
- <sup>183</sup> Arthur Burke to Charlotte Webb, Interview, April 11, 1995, Richmond, Virginia.
- <sup>184</sup> Maurice Rowe to Charlotte Webb, Interview, April 4, 1995. Richmond, Virginia.
- <sup>185</sup> "Report of the Ad Hoc Committee to Plan Science Advisory System," May 13, 1976. Special Collections, Virginia Tech.

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