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by

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Richard A. Overfield*

INTRODUCTION

When formed in 1769, the American Philosophical Society proposed as its main objective the "encouraging and popularizing of useful knowledge." Until the formation of this and similar societies with their scientific journals and promotion of lectures and museums, the primary means of distributing scientific information in America was through newspapers, pamphlets, and personal letters. An investigation of science in a colonial newspaper hopefully will provide some knowledge of the type of scientific information that came to the attention of literate people in the colonies, of the adequacy of newspaper coverage of 18th-century science, and of the ideas held by the public about science. Generally, such an investigation should provide insights into the manner in which scientific ideas reached the non-scientific community.

I. THE *VIRGINIA GAZETTE*

The *Virginia Gazette* was one of the early newspapers in the American colonies. William Parks founded the *Maryland Gazette* in Annapolis in 1727 to make Maryland the fourth colony to have a newspaper, and the same William Parks moved his English Common Press into the first floor of a small brick building in Williamsburg in 1736 to establish the first public printshop in Virginia and the second newspaper in the South.[1] An earlier press had been operated in the colony in 1680 or 1682 through the efforts of John Buckner, a merchant and planter from Gloucester county, who had arranged for the immigration of a trained printer, William Nuthead. The General Assembly initially supported Buckner's efforts, but after a short time the Assembly suspended the press for operating without a license. There was no further use of this or any press until 1736, because the Crown absolutely refused to grant its approval.[2]

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[1]Edwin Emery and Henry Ladd Smith, *The Press and America* (New York, 1954), p. 62; and Frank Luther Mott, *American Journalism* (New York, 1942), pp. 40-41.

[2]Philip Alexander Bruce, *Institutional History of Virginia in the Seventeenth Century* (New York, 1910), I, pp. 402-403; and Virginia Historical Society, "Letters of William Fitzhugh," *The Virginia Magazine of History and Biography*, I (April, 1894), p. 406.

According to all available information, Parks published the first issue of the *Virginia Gazette* on August 6, 1736. The first preserved issue is number 6, dated September 11, 1736, which confirms the validity of the date for the first issue.[3] Descriptions of Parks's work suggested that he was a good printer. One observer said of his *Maryland Gazette* that "his paper reflected good taste, literary skill and pride in the craft he had learned so well under the best English masters."[4]

Parks printed the *Virginia Gazette* until his death on April 1, 1750. Several months after Parks's death, William Hunter became editor and continued to print the *Gazette* until he died on August 12, 1761. Hunter's brother-in-law, Joseph Royle, assumed control of the paper in behalf of himself and William Hunter's son, William. Royle printed the paper until 1765. Alexander Purdie followed Joseph Royle and printed the *Gazette* for one year by himself before forming a partnership with John Dixon. Dixon and William Hunter, Jr., operated the paper from 1775 to 1778 and Dixon and Thomas Nicolson from 1779 to April, 1870, when their printshop, along with the capital of Virginia, was moved to Richmond.[5]

Although there were at various times, one, two, and even three newspapers in Williamsburg, they all carried the title of the *Virginia Gazette*. From 1736 to 1766, only one newspaper operated in Williamsburg. On May 16, 1766, William Rind founded a second newspaper called *Rind's Virginia Gazette*, but he soon shortened it to *The Virginia Gazette*. Rind published the second Gazette from 1766 to 1773, and at his death, his widow, Clementina Rind, continued to operate the press for another year. John Pinkney took over this second *Virginia Gazette* upon the death of Clementina on September 25, 1774, and printed the paper "for the benefit of Clementina Rind's estate."[6] Pinkney introduced one significant change when, starting with the issue of December 6, 1775, he printed his *Gazette* twice weekly. Pinkney published the paper until February 3, 1776, when the second *Gazette* was discontinued.[7]

A third *Virginia Gazette* was established in 1775 by Alexander Purdie who had taken over publication of the original *Virginia Gazette* in 1765. Purdie printed his second newspaper for only five years, from 1775 to 1779, when at his death John Clarkson, his nephew and also one of his printers, and Augustine Davis assumed control of the paper. The last known issue of the third *Virginia Gazette* was December 9, 1780, and, like Dixon and Nicolson, Clarkson and Davis transferred their shop and newspaper to Richmond.[8]

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[3]Lester J. Cappon and Stella F. Duff (comps.), *Virginia Gazette Index* (Williamsburg, 1950), I, p. vi; and *The Virginia Gazette of Williamsburg, 1736-1780*, issued on microfilm by the Institute of Early American History and Culture from originals and photostats loaned by other institutions (Williamsburg, 1950), Checklist of the *Virginia Gazette*.

[4]Emery and Smith, *Press and America*, p. 61.

[5]Cappon and Duff, *Index*, p. vi; and Microfilm of the *Virginia Gazette*, preface.

[6]Clarence S. Brigham, *History and Bibliography of American Newspapers, 1690-1820* (Worcester, Mass., 1947), p. 1161.

[7]Microfilm of the *Virginia Gazette*, Checklist of the *Virginia Gazette*.

[8]Brigham, *American Newspapers*, pp. 1158-62; Cappon and Duff, *Index*, p. vi.; and Microfilm of the *Virginia Gazette*, preface.

Newspapers in colonial America, patterned after their English counterparts, were similar in make-up and news coverage.[9] The *Virginia Gazette* followed the pattern of other colonial newspapers in its layout and method of news gathering. Thus, the *Virginia Gazette* was a good newspaper for the times and added to the intellectual environment of the area surrounding Williamsburg. John Esten Cooke, for example, in evaluating the *Virginia Gazette* stated:

> It was a small, dingy sheet, containing a few items of foreign news; the advertisements of the Williamsburg shopkeepers; notices of the arrival and departure of ships; a few chance particulars relating to persons or events in the colony; and poetical "effusions," celebrating the charms of Myrtilla, Florella, or other belles of the period. Thus, "his Majesty's ancient and great Colony and Dominion of Virginia" had at last its newspaper; and if any event occurred of great interest or importance, the planters of the York or James were certain to hear of it in a week or two, though the incident had taken place as far off as the Blue Ridge or Valley. As to anything like free discussion of the government, that was not the fashion of the times, in newspapers; and the "Virginia Gazette" confined itself to the work of disseminating news.[10]

A more favorable appraiser of the *Virginia Gazette* commented:

> . . . it was handsome typographically, and it was especially strong in its literary department. The "Monitor" essay series shows a mastery of light social satire unusual, if not unique, in colonial literature. Poetry, too, abounded in the *Virginia Gazette*, much of it, and probably much of the prose, coming from students and faculty of William and Mary College. Parks died in 1750; and William Hunter . . . conducted the paper for a little over a decade, maintaining its high literary and journalistic standing and increasing its advertising.[11]

England, of course, was the main source of news and even the reporting of events from Europe was channeled through London. News received from London and printed in the *Virginia Gazette* was from two-to-four months old with the largest part being two or two-and-one-half months old. From Paris, news items were from three to five months old when printed in the *Gazette*. Occasionally, even information concerning Philadelphia or Boston was received by way of London or Glasgow, but by mid-18th century, intercolonial news was generally exchanged directly. News from Boston and New York took about one month to reach the pages of the *Virginia Gazette*, while that from Philadelphia required about two weeks to one month.

Dependence upon London for news items reflected colonial interest in happenings in the mother country, as well as a reluctance or inability on the part of the colonial editor to obtain fresh material. Printers drew freely from magazines and books, and they copied items without the consent of the writer and often without citing the author or source. There was little editorial comment or local news coverage in the modern sense. As the colonies matured and the number of newspapers increased in the leading towns, printers exchanged copies. This resulted in

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[9]Frank Luther Mott, *American Journalism*, p. 3 and Chs. I-III, passim.
[10]John Esten Cooke, *Virginia, A History of the People* (Boston, 1890), p. 330.
[11]Mott, *American Journalism* p. 41.

an increase in the items reproduced from other colonial sources. Printers also received some contributions from correspondents in other colonies and abroad. Another local source of material was the many letters and essays voluntarily submitted by local residents that were sometimes in the manner of current "letters to the editor." Generally, such writings were complicated and lengthy essays that canvassed a variety of subjects.[12]

This method of news-gathering certainly limited the colonial printer in the scope of his material. Taking what was available from these sources, a printer could not be too selective. Despite these shortcomings, the *Virginia Gazette* performed needed services for the colony. Although limited, it included information about and advertisements from the entire colony. The increasing use of the newspaper by the government for official notices, instead of depending entirely upon the parish churches as had formerly been the case, indicates that they were widely read.[13] Not until 1774 was a newspaper founded outside Williamsburg. This was the *Virginia Gazette* or *Norfolk Intelligencer,* and it lasted little more than a year. Not until the 1780's were newspapers established in Richmond, Winchester, Petersburg, Fredericksburg, and Alexandria.[14]

One of the important limiting factors in this study of the reporting of scientific information in the *Virginia Gazette* is the absence of many issues of the newspaper. The study is based on all known issues in the microfilm copy originally issued by the Institute of Early American History and Culture. Having, at times, two or three different newspapers in Williamsburg was helpful in cases where issues of one paper have been lost. This study includes material from all three Williamsburg newspapers by the title of *Virginia Gazette.* The news sources of the three were generally the same; therefore, many items were printed in all the papers. The only major variation came from the contributions of local citizens. Unfortunately, even using all three newspapers, periods remain, some of considerable length, where no issues of any of the *Gazettes* are available. A file of the *Virginia Gazette* owned by Thomas Jefferson and sold to the Library of Congress was completely destroyed by fire on December 24, 1851. In the 1815 Catalogue of the Library of Congress, this early collection was listed under "Virginia Gazette from 1741 to 1783." Thus, a nearly complete file was lost.[15]

The available issues of Parks's *Virginia Gazette* are few. Starting with issue no. 6 of September 6, 1736, the issues for the remainder of 1736 are preserved. The papers of 1737, 1738, and 1739 are nearly complete with only one issue missing in 1737, and two missing in each of 1738 and 1739. In the twenty-five year period from 1740-1765, however, there are few copies preserved. There are only five issues

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[12]Alfred McClung Lee, *The Daily Newspaper in America* (New York, 1937), pp. 36-39; and Mott, pp. 3, 27 50-51.

[13]James Kimbrough Owen, "The Virginia Vestry, A Study in the Decline of a Ruling Class" (Unpublished Ph.D. dissertation, Princeton University, 1948), p. 197.

[14]Brigham, *American Newspapers,* pp. 1112, 1116, 1129, 1134, 1140-41, 1166-67.

[15]*Ibid.*, p. 1159.

available for the year 1740; twenty-three for 1745; twenty-one for 1746; fifty-one for each of 1751 and 1752; one for 1753, 1759, 1761, 1762, and 1763; two for 1754, 1756, and 1757; twenty-six for 1755; and none for 1758, 1760, 1764, and 1765. With the exception of 1751 and 1752, little can be derived from this period.[16]

Starting in 1765, when two newspapers were printed, an adequate number of issues are preserved and generally the missing issues of Purdie and Dixon are filled in by the other one. There are no issues of the *Gazette* for the first two months of 1766 because Purdie and Dixon did not start the newspaper until March 7, and Rind until May 16, 1766. The remainder of the year is complete except for the last issue. The year 1767 is also complete with the exception of the last issue, and all but three issues for 1769 and eleven issues for 1770 are available in one or the other newspapers. A complete file of the paper is available for 1768, 1771 through 1777, and 1779, but most of the issues are missing for 1778 and 1780.[17]

II. MEDICINE

By far the greatest number of articles on science in the *Virginia Gazette* pertained to medicine and more particularly to smallpox. This could be expected in a society that was primarily concerned with the practical and immediate uses of science. The newspaper provided its readers with cures and remedies offered by quack practitioners, arguments for and against inoculation for smallpox, a number of cures and new developments for treating diseases and ailments, news of epidemics both locally and in Europe, and occasionally the description of an unusual medical case.

Accepted medical treatment for most diseases in the eighteenth century still included purging, bleeding, and large amounts of drugs, although there were increasing objections to these procedures. Medicines and cures of the ancient masters remained in use and most persons were reluctant to discard them.[1] "No branch of study," noted a recent observer, "was more bound by ancient Tradition than that of the art of healing."[2] John Oldmixon further observed: "The *Virginians* have but a few Doctors among them, and they reckon it among their Blessings, fancying the Number of their Diseases would increase with that of their Physicians."[3] The extreme faith in drugs, added to their high cost, invited large numbers of drug dispensers and quacks to concoct all sorts of imaginable cures and remedies.[4] In addition, the belief existed among

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[16]Microfilm of the *Virginia Gazette*, Checklist of *Virginia Gazettes*.
[17]*Ibid.*

[1]Abraham Wolf, *A History of Science, Technology, and Philosophy in the Eighteenth Century* (London, 1952), pp. 494-95; and John Duffy, *Epidemics in Colonial America* (Baton Rouge, 1953), p. 8.
[2]Wolf, *Science in the Eighteenth Century*, p. 478.
[3]Quoted in Duffy, *Epidemics in America*, p. 8.
[4]Wolf, *Science in the Eighteenth Century*, pp. 494-95.

many practitioners, both in Europe and America, "that Americans required stronger doses of medicines."[5]

Added to their faith in traditional medicine, the backwardness of American medicine was also attributable to the lack of doctors, especially well-trained ones, and to the absence of licensing and regulation. Because aid from a doctor was scarce and expensive, most Americans were forced to use homemade and traditional remedies.[6] The Bridenbaughs, in describing the high caliber of medicine in Philadelphia, nevertheless admitted that numerous quacks were also practicing.

> Lest this picture seem too bright, it must be remembered that quackery easily kept pace with the growth of legitimate medicine. There was no system of medical licensing, and nothing to prevent untrained apothecaries, barbers, or those who had failed in other lines of work from peddling their miraculous cures. The marks of the quack were his flamboyant advertisements, replete with fulsome testimonials, and his glowing promises to cure anything, but especially cancer and venereal diseases.[7]

The *Virginia Gazette* printed many medical advertisements and most of them fit this decription of quack advertisement. The following two advertisements provide good examples of the type in the *Virginia Gazette:*

> Doctor Rowan, From London,
> Now at Mr. Robinson's in York,
> Cures the scurvy, leprosy, ulcers, cancers, blotches, evil, old scores, green wounds, piles, fistulas, inside or out, without cutting, also deafness, and all inflammations in the head or eyes; he discharges all rheumatick and gouty pains out of the body and nerves, cures fevers, agues, yellow jaundice, scald heads, straightens crooked limbs, cures the headach [*sic.*] in a few minutes, cures the venereal with or without physick, discharges worms out of men, women, and children, and many other disorders too tedious to be inserted, though incurable to others, and on being conformable to directions. No cure no money.[8]

* * *

> Without entering into a long and tedious detail of the many disorders which (with the blessing of God) I am able to cure, and the operations I have performed in foreign countries, the happy experience of which has been authorized by certificates from Princes, Generals, Governours, and city corporations, and in particular from his Britannick Majesty King George III . . . .
>
> I possess the most efficacious remedy to cure some sicknesses with which the country appears to me much afflicted, as all sorts of scurvy distempers. I cleanse the teeth with the utmost ease, and clear them of the scurvy in the gum, making the teeth very white, without uneasiness to the patient. I cure distempers of the eyes, ears, and deafness, couching or taking away cataracts, though the person may have been deprived of sight or hearing for many years.

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[5]Carl and Jessica Bridenbaugh, *Rebels and Gentlemen, Philadelphia in the Age of Franklin* (New York, 1942), p. 268.

[6]*Ibid.*, p. 276; Duffy, *Epidemics in American*, pp. 7-10; and Fielding H. Garrison, *History of Medicine* (Philadelphia, 1929), p. 406.

[7]Bridenbaugh, *Rebels and Gentlemen*, p. 276.

[8]*Virginia Gazette* (Purdie and Dixon), April 7, 1768.

> Likewise I have an infallible remedy for all sorts of wounds, and scorbutick, schirrous, and scrophulous ulcers of all sorts, although of long standing, and though almost incurable.
>
> I profess all sorts of operations in surgery and man midwifery, particularly women when in imminent danger of life.
>
> All persons who live at too great a distance, or are prevented to come themselves by some desperate disorders, and that they have not proper convenience to send for me, by sending their urine they shall have proper advise, according to their disorders.
>
> De Lacoudre, French Doctor, living in Norfolk.[9]

Medicines, medical books, and medical equipment also were offered for sale in the advertisements of the *Gazette*.

> The subscriber, in Princess Anne county, having declined the practice of physick, surgery, and midwifery, has for sale a set of chirurgical instruments; also a collection of excellent treatises on physick, surgery, midwifery, and anatomy, by celebrated authors, among which are the famous *Boerhaave's* aphorisms, his chymistry, and his academical lectures, all as good as new; likewise some empty vials and gallipots. Any person in want of such may be supplied, very cheap, by
>
> Christopher Wright[10]

A number of cures were included in the *Virginia Gazette* apart from the advertisements. Local physicians submitted papers prescribing treatments, but the cures reported in the *Gazette* were mainly received from England. Most articles reported cases in which a new drug or treatment had been purposefully tried, or accidentally tried, and had proved successful. A few, however, related established cures submitted by trained doctors.

Prevalent during this period were the cure-all drugs, medicines, and waters, some of which were local remedies while others reached international fame. The claims that medicinal waters could cure any disorder were common both in Europe and America. Virginia had a number of mineral springs, some of which were known for their cure of special ailments, while others supposedly cured anything. John Ferdinand Dalziel Smyth, a traveler in Virginia in 1773, described such mineral springs near Petersburg:

> About thirty miles higher up, on the side of this river, near one Ingram's plantation, there have been lately discovered some very valuable medicinal springs of mineral waters, which have already performed many most remarkable and astonishing cures on persons afflicted with various kinds of lameness, infirmity, and disease, who annually resort to these springs from an hundred and fifty miles around.[11]

Surprisingly enough, however, there was only one mention in the *Virginia Gazette* of such waters. This was in 1737 in a short notice describing the waters at Lough-Leighs in Ireland. These waters "perform such wonderful Cures for the Scurvy and Itch, Cancers, Scald-

[9] *Ibid.*, September 1, 1768.
[10] *Ibid.*, August 15, 1766.
[11] Quoted in Wyndham B. Blanton, *Medicine in Virginia in the Eighteenth Century* (Richmond, 1931), p. 9.

heads, Sores, Scabs, Ulcers, and Venereal Disorders, that the People from all Parts of the Kingdom are flocking thither. . .no Waters in Europe, are equal to these, both for internal and external Disorders."[12]

One of the best known cure-alls introduced to the medical world by an American was senega or Seneca rattlesnake root (Polygala senega). John Tennent, of Virginia, wrote the first account of Seneca rattlesnake root and had it printed by William Parks in 1736.[13] Tennent advocated the use of senega to the colonists and even traveled to England in an attempt to obtain acceptance of his new drug. His trip proved worth-while for he gained membership in the Royal Society and received a £100 grant from the Virginia Assembly.[14]

Tennent originally claimed that because of the plant's resemblance to the shape of a snake's rattle, Senega rattlesnake root successfully counteracted rattlesnake bites. In *An Essay on the Pleurisy*, Tennent revealed additional medical applications of senega, had the work circulated throughout Virginia, and then sent copies of the forty-six page pamphlet to England and France.[15] Tennent's claims were immediately challenged. An advertisement for the pamphlet circulated on October 1, 1736, and Tennent's first article in defense of senega appeared in the *Virginia Gazette* on October 8.

Tennent's first article was a copy of his letter, "To the honourable Sir Richard Mead, M.D." Mead was a London doctor. The main body of the letter concerned the usefulness of senega in curing gout. In a second article, *An Essay on the Pleurisy*, in the issue of March 4, 1737, Tennent defended his pamphlet of the same title. An article against Tennent and his rattlesnake root appeared in the *Gazette* of June 10, 1737, and Tennent replied through the newspaper on July 15, and again on December 16, 1737. This last article was a letter from Tennent while he was in London.

The *Virginia Gazette* ran a series of four articles in 1738 entitled "A Memorial, humbly addressed to the learned, impartial, and judicious World, by John Tennent, Practitioner in Medicine." In the Memorial, written after his return from England, Tennent not only reiterated his arguments for the use of Seneca rattlesnake root, but he defended his actions in England. Tennent was accused of scandal and misconduct in England, and he had acquired debts which he was unable to pay without a reward from the Virginia Assembly for his medical discovery. He received only £100 of an expected £1,000 from the assembly, however, and later Parliament refused to grant him any compensation.

In the first part of the Memorial, Tennent discussed "impudent" people:

> *Impudence* in this Case is very applicable, is but too true, with Respect to my free and open Publication of the Efficacy of the

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[12]*Virginia Gazette* (Parks), January 21, 1737.
[13]Garrison, *History of Medicine*, p. 376.
[14]Brooke Hindle, *The Pursuit of Science in Revolutionary America* (Chapel Hill, 1956), p. 64.
[15]Blanton, *Medicine in Virginia*, pp. 122, 128.

> *Seneca Rattle-Snake Root* to this and the neighboring Colonies, subject to *Pleuritick* and *Peripneumonick* Diseases, that are Epidemical and very Mortal, and occur almost every Year; which has, from numerous Instances, been found a most successful Remedy in the Cure thereof.[16]

Tennent intermixed medical information with criticisms and rebuttals which at times made his writing confusing, but such confusion was characteristic of many writers in the *Virginia Gazette*.

Tennent revealed that he had obtained recommendations in Virginia from William Gooch and William Byrd to take with him to England. After being interviewed in London, he received a recommendation to the University of Edinburgh from Dr. Thomas Pellet, Dr. Richard Mead, and Dr. James Monro.

> We whose Names are under-written, do certify, That having examined and conversed with Mr. John Tennent, and having enquired into his Character, of which he has good Testimonials from Virginia, where he has lived and practised Physick for about Ten Years; We do find him well qualified for the Degree of a Doctor in Physick, and do therefore recommend him to the Professors of the University of Edinburgh, that he may be admitted to that Degree.
>
> Tho. Pellet
> R. Mead
> Ja. Monro[17]

Tennent stated that these recommendations show "inconsistency with slanders," and this may indeed be true, although there were numerous cases of quacks who were able to fool the educated during this period. Certainly his recommendations indicated solid support; William Gooch was Governor of Virginia; William Byrd, known for his interest in science, was influential in Virginia as a member of the Council; Richard Mead, as "Head of the Republic of Learning in Physick," was apparently a very able and popular doctor as he "became the most prosperous practitioner" of his time;[18] and Thomas Pellet was president of the College of Physicians.[19]

Equipped with his recommendations for a doctor's degree at Edinburgh, Tennent failed to obtain it, but he rationalized his failure by stating that they gave "diplomas mercenarily, to those who deserve them not."[20] Tennent similarly shunted his medical detractors who opposed Seneca rattlesnake root by referring to them as quacks.[21]

In addition to a defense of his behavior in the lengthy Memorial in the *Gazette* that occupied most of the first two pages of the newspaper for four consecutive weeks, Tennent endeavored to prove the effectiveness of Seneca snake root in combating any disease involving a coagulation of the blood. Tennent stated that he had seen "Pleurisies, Peripneumonies, tertian and quartan Agues, Dropsies, Rheumatick and Paralytick Cases cured by it, and the Gout much relieved; and therefore

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[16]*Virginia Gazette* (Parks), September 22, 1748. (Richmond, 1931), p. 9.

[17]*Ibid.*

[18]Garrison, *History of Medicine*, p. 390; and *Virginia Gazette* (Parks), September 22, 1738.

[19]*Virginia Gazette* (Parks), December 16, 1737.

[20]*Ibid.*, September 29, 1738.

[21]*Ibid.*

hope I may say, without such an Imputation as Arrogance or Ostentation, that I have Reason to think I judg'd in this Matter rightly."[22] Tennent reasoned that rattlesnake venom caused coagulation of the blood because a bitten man spat coagulated blood. Further, stated Tennent, since all coagulation resulted from the separation of like from unlike materials, a relationship existed in the coagulation of all fluids. Tennent, showing that coagulation resulted from a variety of actions, concluded:

> . . . whence it appears, that tho' a Coagulation of the Blood will produce different Diseases according to the Circumstances of the Constitution when they arise; yet the *Seneca Rattle-Snake Root* promises to be serviceable in them, because of the Analogy prov'd between all Coagulations. In what Cases it will be of greater or lesser Service, Experience must determine.[23]

Following this reasoning, Seneca rattlesnake root was an applicable remedy for myriad disorders even though the symptoms or effects of the disorders might differ. In his article on the gout, Tennent reasoned the same as he had with pleurisy; coagulation of blood in gout was the same as in rattlesnake poisoning.

> That since the Cure of the *Gout* (if the Expression may be allowed) consists in hindering the Union of those Particles, which form a tenacious Matter, that stagnates in and about the Joints; or in dividing and reducing it to a fit Minuteness; for the common Secretions when formed or united, the *Rattle-Snake's Root* is the most likely Thing to effect these Operations, because it dissolves the Grumes and Coagulation of the Blood, caused by the *Rattle-Snake's* Venom . . . .[24]

Tennent, in the same article, stated that senega was also effective in curing consumption, dropsy, and rabies. Writing from England in 1737, he added: "But now, since it is plainly proved by Experience, that the *Rattle-Snake Root* cures the *Pleurisy*, I suppose the next objection against it is, that it can cure nothing else."[25] He concluded that "this *Root* is certainly one of the best Medicines in the world, and adapted to most Diseases which Virginia is subject to."[26] On another occasion he boldly asserted that Seneca snake root "recovers the patient in any stage of diseases" and "will be of more extensive Use than any Medicine in the whole *Materia Medica*."[27]

Judging from the censures of Tennent and his rebuttals to opponents in the *Virginia Gazette*, apparently he met with considerable opposition, yet the only disapproving article to appear in the *Gazette* was one sent to William Parks by "I. C." and signed "Philo-Mathesis." Accusing Tennent of "false suggestions" and of censuring "a Faculty" for opposition to his *Essay on the Pleurisy*, "I. C." argued that coagulations were not similar, even those of pleurisy and rattlesnake venom, "for un-

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[22]*Ibid.*, October 13, 1738.
[23]*Ibid.*
[24]*Ibid.*, October 8, 1738.
[25]*Ibid.*, December 16, 1737.
[26]*Ibid.*
[27]*Ibid.*, October 6, 1738.

doubtedly, if either the Fluids differ, or the interposing Matters differ in their component Parts, the Coagulum must certainly differ in a Reciprocal Ratio."[28] Tennent agreed that the composition of fluids differed, but he maintained that during coagulation and the change from a liquid to a solid all materials react exactly alike.[29]

One article appeared in the *Virginia Gazette* in defense of Tennent. Copied from the *Pennsylvania Gazette*, it was a letter from Thomas Bond in Paris. Bond noted that senega had been sent to France where Jussieu, the well known French botanist, and others used the root and found it extremely effective for pleurisy.[30]

Despite his rapid ascent to medical prestige and just as rapid decline, Tennent's appearance on the Virginia medical scene was indeed an interesting one. Returning to London in 1739, Tennent further damaged his reputation by association with a "famous quack," Dr. Joshua Ward. In an attempt to alleviate his debts, Tennent married a Mrs. Hanger and was arrested for bigamy for also "having kept 'one Mrs. Cary under the name of Mrs. Tennent.' "[31] Additional criticism in Virginia was directed against the title that Tennent used in England of the "*American Doctor, who has discover'd a great Mystery*," but Tennent explained that it was the best means of getting money for his work.[32] The Virginian spent much of the remainder of his now-tarnished career reiterating his claims and his accusations against his enemies.[33]

The Memorial by Tennent was by far the longest article on science in the *Virginia Gazette*. His shorter *Essay on the Pleurisy* and his other three articles that appeared in the newspaper were mainly a statement and restatement of his concept of coagulation and the effectiveness of senega. Although there were objections to his basic hypothesis, most of Tennent's difficulties developed when he expanded the use of senega from a cure for rattlesnake bite and pleurisy to a cure-all. Yet, even though senega was not all that Tennent claimed, the sixth *Pharmacopoeia*, which was printed in 1788, included it as a new drug.[34]

As mentioned, Tennent, while in England in 1739, had associated with another cure-all physician, Joshua Ward. Ward gained fame in England by promoting a number of pills and powders for various diseases. His patients included many leading persons in England, among whom was George II. Although John Tennent damaged his reputation by his association with Ward in 1739, Ward continued his practice and was not affected by the Parliamentary Act of 1748 that "restricted the practice of medicine."[35] Thus, Ward was able to maintain a respectable reputation, at least among non-medical persons, far beyond 1739.[36]

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[28]*Ibid.*, June 10, 1737.
[29]*Ibid.*, July 15, 1737.
[30]*Ibid.*, August 17, 1739. This letter was sent to Benjamin Franklin by Phineas Bond.
[31]Blanton, *Medicine in Virginia*, pp. 126-127.
[32]*Virginia Gazette* (Parks), September 22, 1738.
[33]Blanton, *Medicine in Virginia*, p. 126.
[34]*Garrison, History of Medicine*, p. 392.
[35]*Ibid.*, p. 386.
[36]*Ibid.*, pp. 385-86; and Blanton, *Medicine in Virginia*, pp. 129, 181, 213.

The only notice of Ward in the *Virginia Gazette* was a short article from York in England that told of Ward's visit to his birthplace at Gisborough. It related that enthusiastic crowds of four or five hundred persons daily sought his aid, and "tho' he stay'd but a small Time, it's wonderful to think the many extraordinary Cures he made, and great Good he did there."[37] Although criticized by medical opponents and doctors, this article attested to Ward's great public popularity.

Two other articles that appeared in the *Gazette* described Joanna Stephens and her cure for stones. The first, a short article, announced that Mrs. Stephens was to receive £5000 for her work if a group of physicians and surgeons appointed by Parliament approved the cure.[38] The second article covered more than a page of the *Virginia Gazette* and was "published by order of the Trustees named by Parliament for providing a reward to Joanna Stephens upon the discovery of a medicine for cure of the stone."[39] This was a detailed description of the preparation and usage of the "powder, decoction, and pills" of Mrs. Stephens. These unpleasant mixtures consisted of burnt egg shells, snails, herbs, soap, pig cresses, honey, wild carrot and burdock seeds, hips, hawes, and water.[40] Unfortunately for all concerned with the reward, autopsies disclosed stones in all her "certified 'cures.'"[41]

The cure-alls of Tennent, Ward, and Stephens appeared in the newspaper in the 1730's, but such cures were not restricted to that early period. Constant Woodson of Prince Edward county, Virginia, for example, proposed a cure for cancer that resulted in the printing of four letters in the *Virginia Gazette* in 1766. The first letter, written by Thomas Dosson, was a testimonial regarding the marvelous work done by Mrs. Woodson in curing cancer. Dosson stated that he had had cancer on his neck, "to the bigness of a pint bowl," and after trying a number of doctors he was directed to Constant Woodson. "I accordingly applied to her," Dosson continued, "and soon obtained relief; I did not suffer so much in the whole cure as I did in 24 hours with others. She seemed to make a trifle of it; and she cured many others whilst I was with her."[42]

Dosson's letter was printed in October, 1766, and the next testimonial for Mrs. Woodson did not appear until March, 1768. James Kirk, as the sender of the second letter, related the cure of his wife's breast cancer.[43] Since the letters by Dosson and Kirk appeared in the advertisement section of the newspaper, apparently Mrs. Woodson paid to have the testimonials circulated. Less than two months after Kirk's testimony, a letter signed by Constant Woodson was printed in the newspaper. She asked any doctor who had failed to cure a cancer to send his patients to her; in particular she mentioned Dr. Brown of Southhampton

[37]*Virginia Gazette* (Parks), December 2 1737.
[38]*Ibid.*, July 13, 1739.
[39]*Ibid.*, October 5, 1739.
[40]*Ibid.*
[41]Garrison, *History of Medicine*, p. 386.
[42]*Virginia Gazette* (Purdie and Dixon), October 17, 1766.
[43]*Virginia Gazette* (Rind), March 31, 1768.

and Dr. Walker of Hanover.[44] Dosson had mentioned a Dr. Hunter, who had been unsuccessful in curing his cancer, and Kirk had stated that his wife "applied to every person of skill that she could hear of, and amongst the rest to Doctor FLEMING, and Doctor CABELL."[45] The testimonials provided a clever way for Mrs. Woodson to discredit her competitors, hopefully to draw away their patients, and to counter claims against her ability to cure cancer.

One month after Mrs. Woodson's letter, the *Virginia Gazette* contained a second letter by James Kirk. Kirk denounced Mrs. Woodson's cure of his wife and indicated that the first letter had been written by Mrs. Woodson.

> Whereas Constant Woodson, of Prince Edward county, hath lately published to the people of this colony, that she hath cured several women of the cancer, particularly Agness Kirk, of this county, and proposes to exert her utmost skill to cure all who are pleased to apply to her, that are troubled with that disease; and lest any person should be imposed upon by the false pretensions of an unskilful physician, to their loss and disadvantage, I have taken this method to inform the public, that her endeavours to cure Agness Kirk have proved ineffectual, and so far from producing a perfect cure (as Mrs. Woodson proposed) that she hath been much worse with that disease since she dealt with her than she ever was before, and also with others, which by two skilful and able physicians, is attributed to the improper medicines Mrs. Woodson applied for the recovery, insomuch that she hath been confined to her bed, in a languishing condition, for upwards of three months. Therefore to prevent the like inconveniences to others I thought proper to acquaint the public with the above, as their real friend, and humble servant,
>
> JAMES KIRK[46]

In 1770, a last item in the *Virginia Gazette* concerning Mrs. Woodson revealed that her practice of curing cancer was continuing, and that her work was still held in high esteem, at least by the writer – who might well have been Mrs. Woodson.

> On the 4th instant died, of that painful and lingering disorder a cancer, Mr. Anthony Hay, a master of the Raleigh tavern in this city. He underwent several severe operations, in his lip and face, for the disorder, at home; and at length went (unhappily too late) to Prince Edward, where he was some time under the care of Mrs. Woodson, famous for the cures she has made.[47]

In addition to Mrs. Woodson's claims, several cures were submitted to the newspaper in answer to inquiries in the *Virginia Gazette* for information about cancer.[48] Luther Martin and Mace Picket answered William Hansbrough and offered the names of people successful in treating cancer.[49] A letter from London contained an unusual, but interesting, cure writen by "a Lady whose veracity it is said is not to be

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[44]*Ibid.*, May 12, 1768.

[45]*Ibid.*, March 31, 1768.

[46]*Ibid.*, June 16, 1768.

[47]*Virginia Gazette* (Purdie and Dixon), December 13, 1770.

[48]*Virginia Gazette* (Parks), September 1, and November 17, 1738.

[49]*Virginia Gazette* (Purdie), June 6, June 20, and July 11, 1777.

doubted." This remedy for breast cancer consisted of placing eight toads in muslin bags and applying them, like leeches, to the cancer. The toads supposedly drew out the cancerous material and dropped off "in agonies, terrible to behold." Interested evidently in scientific precision, it was reported that 120 toads were needed to completely heal cancer. The writer added that this had been successful, not once, but several times.[50]

Not all information in the *Virginia Gazette* concerning medicine related to cure-alls or quacks. Attempts were also made to inform the public of legitimate treatment of diseases or of incidents of general interest. There were many mentions of fevers, sometimes identified as yellow fever, but generally not specified. They chould have included yellow fever, malaria, dysentery, typhoid, typhus, or others of lesser severity.[51] Only two articles dealt with the description and care of fevers; the remainder told of diseased areas.

The two discussions of fevers were written by "J. D.," who was most likely John Dalgleish, a physician of Norfolk, Virginia.[52] They were largely devoted to his beliefs on the practice of medicine. In the first article, Dalgleish warned of the "supine negligence" of the people regarding the fever occurring in Norfolk and Princess Anne counties. This negligence, he stated, "may have been occasioned by the too confident and too long continued assertion of some that this fever is not catching."[53] Discussing the nature of fevers in his second article, Dalgleish concluded that fever in humans and distemper in animals were the same disease. Fortunately, it was easier to cure a human being because of his simple stomach. Dalgleish also claimed that he had successfully discovered a new remedy for the fever, but he did not include a description of his finding.[54]

The numerous accounts in the *Virginia Gazette* of areas suffering from fever were generally extracts from other newspapers, letters, or news from shipmasters. The accounts were sometimes printed as separate news items, but usually consisted of a sentence-or-two notice in the midst of shipping or general news. For example, a ship reached Boston in October, 1738, with news of fever and smallpox on Antigua Island in the West Indies,[55] and another, in January, 1739, of yellow fever at St. Christopher.[56] A month later, at New York, news was received that the yellow fever continued at St. Christopher where many had died.[57] Other mentions of yellow fever or black vomit were Florida, in 1739;[58] Kingston, Jamaica, in 1751, where five or six whites were dying per day;[59] Trinity and St. Pierre, Martinique, in 1771;[60] Dunkirk,

[50]*Virginia Gazette* (Purdie and Dixon), September 1, 1768.
[51]Duffy, *Epidemics in America*, p. 202.
[52]This assumption is based on earlier letters printed in the *Virginia Gazette* in which J. D. is referred to as John Dalgleish.
[53]*Virginia Gazette* (Purdie and Dixon), April 20, 1769.
[54]*Ibid.*, November 8, 1770.
[55]*Virginia Gazette* (Parks), October 20, 1738.
[56]*Ibid.*, March 9, 1739.
[57]*Ibid.*, April 13, 1739.
[58]*Ibid.*, January 18, 1740.
[59]*Virginia Gazette* (Hunter), December 19, 1751.
[60]*Virginia Gazette* (Purdie and Dixon), September 5, 1771.

in 1773;[61] and Bridgetown, Barbados, in 1773.[62] References only to epidemical fevers were Dominica, in 1767;[63] Guadeloupe and the other French islands, in 1768;[64] the Isle of Man, in 1770, from which there was danger of it spreading to England;[65] Hispaniola, in 1771;[66] the Lewis Islands, in 1772;[67] Rockfort, Belgium, in 1773;[68] Seisensels, in 1773, where they had appealed to the government "to appoint nine days prayers to be put up to St. Stephen to stop its progress";[69] and New York, in 1777, among the Continental prisoners.[70]

One cure for whooping cough was printed in the *Virginia Gazette.* It was a prescription by a Dr. Amson and was an interesting example of a treatment for the illness during the colonial period.

> It will be proper to begin with a Vomit, of an infusion in boiling water of Ipecacuanha, with the addition of Oxymel of Squills, and once in five or six Days to purge gently with a little Manna and Cream of Tartar, or the like; having Regard to the Age of the Child. For a Boy of 10 Years old, 25 Grains of Ipecacuanha with a Spoonful of Oxymel, will be a proper Dose.
>
> It will be proper to work it off with Camomile Flower Tea, and to give, when it has done working, thirty or forty Drops of Elixir Paregosicum in a little Pennyroyal Tea and Mint Water, sweetened a Pleasure; and this is proper to be given every Night.
>
> Give every Day, once in 2 or 3 Hours, a Spoonful of the following Mixture: Take two Drachms of Gum Ammoniac, dissolve them in a Pint of Pennyroyal Tea, strain it off, and add four Spoonfuls of Honey, and Half a Pint of the following:
>
> Take two Hundred Woodlice, wash them in wine, then press out the Juice, and mix it with a Pint of White Wine, in which two Drachms of Saffron have been infused.[71]

There was no continuity between most articles that appeared in the *Gazette;* instead, they were short notices on various topics that might interest the public. Two short articles told of a cure for snake bite. The first, in 1739, related a Sweet Oil treatment presented to the Royal Society, and the second, in 1755, stated that Adder or Serpent Stone was actually burnt Hartshorn and described its use.[72] An extract from Paris stated that Monsieur Pereyre was successfully developing a "method of bringing persons born deaf to speak."[73] A rather lengthy, but plainly written article described a mad dog, the dangers of his bite, the symptoms of the resulting disease, and a pertinent treatment.[74] Landon Carter, a member of the Society for the Promotion of Useful Knowledge in

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[61] *Ibid.*, March 11, 1773.
[62] *Ibid.*, March 10, 1774.
[63] *Ibid.*, December 10, 1767.
[64] *Ibid.*, July 28, 1768.
[65] *Ibid.*, February 7, 1771.
[66] *Ibid.*, August 29, 1771.
[67] *Ibid.*, January 14, 1773.
[68] *Virginia Gazette* (Rind), June 10, 1773.
[69] *Ibid.*, April 22, 1773.
[70] *Virginia Gazette* (Dixon and Hunter), June 27, 1777.
[71] *Ibid.*, September 27 1776.
[72] *Virginia Gazette* (Parks), September 21, 1739; and *Virginia Gazette* (Hunter), March 21, 1755.
[73] *Ibid.*, February 13, 1752.
[74] *Virginia Gazette* (Rind), August 13, 1767.

Williamsburg, expressed his views on the Quarantine Laws of Virginia and on a means of preventing the plague. Because of its success in Russia, Carter advocated fumigation and included a formula for fumigation powder. Moreover, not to neglect the issues of the time, Carter briefly commented in the article on the relationship between Great Britain and the American colonies.[75] Many of the short extracts in the *Virginia Gazette,* from letters, were of unusual medical cases and were therefore of interest to the reading public. Several unusual surgical cases were described in the *Gazette,*[76] as were several new surgical techniques.[77]

The disease that received the most attention in the *Virginia Gazette* was smallpox. This was understandable in the light of the widespread distribution of the disease. An epidemic existed in Europe and America most of the time to remind people of its devastating effects, and the disease seemed to be feared more in America than in England. This was probably a result of its sporadic outbreaks in the colonies in contrast to its remaining constantly within the populous cities of England. According to the records of Dr. James Jurin of the Royal Society, from 1681 to 1723 the death rate for smallpox in the area of London was one out of fourteen; two out of eleven persons had contracted the disease. The death rate in America apparently was lower, although the records of Dr. William Douglas registered the death rate for the Boston epidemic of 1721 as one out of seven. This epidemic, however, was one of the worst during the colonial period.[78]

Smallpox spread throughout the American colonies, but the areas that suffered most were the port cities, particularly Boston and Charleston. Aside from the ports, the middle colonies were hardest hit by the disease. New England had only occasional epidemics. The least affected area, outside Charleston, was the sparsely populated rural area of the Southern colonies, and in that area Virginia had the least trouble with smallpox. Minor outbreaks of the disease appeared in Virginia in the first few years of the eighteenth century, and in 1715, 1737, 1748, and 1768.[79]

A major controversy developed in the eighteenth century, both in Europe and America, over the practice of inoculation. Medical practitioners tried many remedies to combat a disease as deadly as smallpox, but inoculation was one of the most successful. A type of immunity was known and used in the Near and Far East for several centuries before it was introduced into Europe. The first evidence of the introduction of inoculation into England was a description of the operation in letters from Greece and Turkey to several members of the Royal Society. Accounts of inoculation appeared in the *Philosophical Transaction* of the Royal Society by Dr. John Woodard in 1714 and by Hans Sloane the following year. Little popular support for inoculation was generated,

[75]*Virginia Gazette* (Purdie and Dixon), December 3, 1772.

[76]*Virginia Gazette* (Parks), September 7, 1739; *Virginia Gazette* (Hunter), April 3, 1752; and *Virginia Gazette* (Purdie and Dixon), September 22, 1768.

[77]*Virginia Gazette* (Hunter), December 19, 1751; *Virginia Gazette* (Purdie and Dixon), October 4, 1770; and *Virginia Gazette* (Rind), October 22, 1772.

[78]Duffy, *Epidemics in America,* pp. 16-22.

[79]*Ibid.,* pp. 69-102.

however, until Lady Mary Wortley Montagu, wife of the British ambassador to Turkey, had her son successfully inoculated in 1718 and her daughter in 1721. The practice spread among upper-class families, including that of George I, although at the same time opposition continued.[80]

Opposition to inoculation increased for several reasons; one was because of religious beliefs. Acceptance of inoculation, however, was largely accomplished by the support of the clergy, while opposition based on religious principles came largely from laymen.[81] The primary opposition came from persons who believed that inoculation increased the danger of smallpox by spreading it and introducing it into areas not presently affected, and "while most of the opposition was essentially irrational, the claim that inoculation could spread the smallpox was correct."[82] Because of the unrestricted practice of inoculators and deaths from inoculation in several important families, opposition to inoculation gained strength during the late 1720's. The general assumption of historians has been that inoculation fell into disuse from 1728-1743, but strong evidence has shown that the practice continued at least in England during the entire period.[83]

Zabdiel Boylston and Cotton Mather introduced inoculation to America in 1721 to combat an epidemic in Boston. They inoculated approximately four hundred people and only twelve deaths resulted. Nevertheless, the practice spread slowly until 1738 when its successful use in Charleston by Dr. James Kilpatrick brought a general acceptance. As a result, it was adopted in most colonies by 1750 and its use in combating the disease surpassed that of Europe. "In England," concluded John Duffy, "where variolation [inoculation] was restricted to a relatively small percentage of the upper classes during the eighteenth century, the practice was of doubtful value; but in the British American colonies, where it was given a more extensive trial, it was an important factor in reducing smallpox fatalities."[84] Opposition to inoculation continued, however, throughout the eighteenth century even among many who admitted its effectiveness. Some modified their outright opposition to a desire for the colonial legislatures to regulate the practice effectively.[85]

Numerous extracts printed in the *Virginia Gazette* pertained to smallpox in Europe, but the majority of these appeared in 1768 and 1769 and concerned inoculation. Despite the use of inoculation for over forty years, substantial opposition persisted in the 1760's. A note from London stated that an "eminent dissenting minister" refused to pray for the Prince of Wales because his inoculation for smallpox placed him in the "hands of men, not God."[86] Another note from London related

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[80]Walter R. Bett (ed.), *The History and Conquest of Common Diseases* (Norman, 1954), pp. 51-54; and Duffy, *Epidemics in America*, pp. 24-26.

[81]Duffy, *Epidemics in America*, pp. 30-32.

[82]Bett, *History of Common Diseases*, p. 52.

[83]See Genevieve Miller, "Smallpox Inoculation in England and America: A Reappraisal," *William and Mary Quarterly*, XIII (October, 1956), pp. 476-92.

[84]Duffy, *Epidemics in America*, p. 24.

[85]*Ibid.*, pp. 23-42.

[86]*Virginia Gazette* (Purdie and Dixon), May 16, 1766.

that Dr. Hosty, of the College of Physicians in Paris, had introduced inoculation into France and had been visiting England to learn more about the method.[87] A month later, however, the College of Physicians in Paris voted 32-23 against the use of inoculation.[88] Later in the summer of 1768 an essay by Voltaire on smallpox inoculation appeared in the *Virginia Gazette*. Voltaire, a leading advocate of inoculation in France, condemned the French people for their refusal to accept the practice of inoculation.[89] He introduced his essay by stating:

> It is inadvertently affirmed in the Christian countries of Europe that the English are fools and madmen: Fools because they give their children the smallpox, to prevent their catching it; and madmen, because they wantonly communicate a certain and dreadful distempter to their children, merely to prevent an uncertain evil. The English on the other side, call the rest of the Europeans cowardly and unnatural: Cowardly, because they are afraid of putting their children to a little pain; unnatural, because they expose them to die one time or other of the smallpox. But that the reader may be able to judge whether the English, or those who differ from them in opinion, are in the right, here follows the history of the famous inoculation which is mentioned with so much dread in France.[90]

In relating the development of the method of inoculation among the Turks and Persians, Voltaire exclaimed that "had the Lady of some French Ambassadour brought the secret from Constantinople to Paris the nation would have been forever obliged to her." Voltaire concluded:

> But are not the French fond of life, and is beauty so inconsiderable an advantage as to be disregarded by the Ladies? Perhaps our nation will imitate, ten years hence, this practice of the English if the clergy and the physicians will give them leave to do it; or possibly our countrymen may introduce inoculation three months hence in France out of mere whim, in case the English should discontinue it through fickleness.[91]

Two final notes of opposition to inoculation from Europe that appeared in the *Virginia Gazette* reported the burning of a house in Yaxley, England, which had been used for inoculation by Doctors Sutton and Bond and the discrediting of the method in Vienna because of the Archduke Ferdinand's slow recovery from inoculation.[92] Only the year before, the Empress at Vienna had proposed to reward soldiers who had their children inoculated.[93]

The *Virginia Gazette* printed three articles concerning the inoculation of Czarina Catherine II of Russia. Dr. Thomas Dimsdale, an English physician, inoculated Catherine and her son in 1768, and with the successful completion of the operation, day-long church services were held in Russia, and Catherine was praised in the *Virginia Gazette*. "We think this ought to be told to the honour of the Empress, that in a country where the practice of inoculation was unknown that the

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[87]*Ibid.*, April 28, 1768.
[88]*Ibid.*, May 26, 1768.
[89]Bett, *History of Common Diseases*, p. 53.
[90]*Virginia Gazette* (Purdie and Dixon), August 11, 1768.
[91]*Ibid.*
[92]*Ibid.*, June 23, 1768; and *Virginia Gazette* (Rind), June 29, 1769.
[93]*Virginia Gazette* (Rind) September 15, 1768.

Empress suffered the first experiment to be made upon herself; a noble instance of her Majesty's great resolution and firmness of mind, as well as uncommon attention to the welfare of her people."[94] Dimsdale received for his services the title of a "Baron of the Russian Empire," the rank of Major General in the Medical Corps, £2000 for the expenses of his trip, £10,000 for the inoculation, and £500 per year till his death.[95] In addition, Dimsdale was to head the planning of several inoculation hospitals in Russia.[96]

Other accounts of smallpox in Europe included the acceptance of Daniel Sutton's method of inoculation in the European settlements of Asia,[97] the successful inoculation of "his Royal Highness Prince William Henry, and the Princess Royal" of England,[98] the death of 16,000 persons in Naples from smallpox,[99] awards to Sir John Pringle for his leadership in introducing inoculation into England,[100] and the announcement that all persons of the French royal family and their relatives were to receive smallpox inoculations in hope of setting a pattern for the rest of Europe.[101]

The articles on smallpox that were of greater practical use and interest to residents of Virginia also were concentrated in the period 1768 to 1772, only six such articles having been printed before 1768 and five after 1772. The earliest of these articles in the *Virginia Gazette* was an extract from *Gentlemen's Magazine* of August, 1736. Written by a Dr. Bettenson, of Bath, England, it prescribed a treatment for smallpox. Dr. Bettenson advised the use of wine, from one to three quarts per day, as a means of strengthening the blood and of carrying the pox away from the head and chest. He stated that "Bleeding and Purging have had ill Success in London," and "Giving the Blood more Life and Strength, is the only rational Way to secure People."[102] Another extract from London told of a cure in which only toast and water were given to the patients.[103] A third method of treatment came from Charleston, South Carolina, where residents during the outbreak of smallpox had been advised to use tar water, which "would cleanse their Bodies and thereby cause the Pock to be favourable." Tar water was a mixture of two quarts tar to two and one-half quarts of water, and after settling, the patient was to drink a pint a day for a week and diminish the amount to one-fourth pint the second and third weeks. This, the writer claimed, had proved to be better than inoculation.[104] The use of tar water was the same, or very similar to, the cure proposed by William Byrd in a letter to Sir Hans Sloane in August, 1737, and printed in the *Pennsylvania Gazette* on March 3, 1737; therefore, this

[94]*Ibid.*, February 9, and March 16, 1769.
[95]*Ibid*, March 23, 1769.
[96]*Ibid.*, March 30, 1769.
[97]*Ibid.*, October 13, 1768.
[98]*Ibid.*, February 9, and March 16, 1769.
[99]*Ibid.*, March 23, 1769.
[100]*Virginia Gazette* (Purdie and Dixon), April 6, 1769.
[101]*Ibid.*, September 1, 1774.
[102]*Virginia Gazette* (Parks), January 7, 1737.
[103]*Ibid.*, June 3, 1737.
[104]*Ibid.*, August 11, 1738.

method of treatment evidently had wide acceptance.[105]

The first mention of inoculation in the *Virginia Gazette* appeared in October, 1737, and was an account of the successful use of this method in Philadelphia. Of the 129 persons inoculated by Doctors Kearsley, Zachary, Hooper, Cadwallader, Shippen, Bond, and Sommans, only one died.[106]

A final item appeared during this early period that told of the continuance of smallpox in South Carolina and the subsequent passage by the Assembly in 1738 of an act forbidding inoculation within two miles of Charleston.[107] Because opposition remained strong against inoculation, even after its proved success, most colonies forbade inoculation at one time or another. As noted, inoculation helped spread smallpox in areas where the practice was carelessly handled, yet most colonies allowed inoculation by 1760 and passed laws to regulate the process.[108]

The outbreak of an epidemic in Virginia in 1752 prompted the renewal of the discussion of smallpox and an individual who signed himself "R. W." sent a letter to the *Virginia Gazette* on the treatment of the disease. In his letter, "R. W." provided a history of smallpox, beginning with the Ethiopians, and a history of inoculation. In combating smallpox, the colonist had advantages over the European, claimed "R. W.," for they were less crowded and they could first use their slaves to experiment with inoculation. "R. W." added that because "People of Quality and Fortune in England have much embrac'd it, doubt not it will soon be universal."[109]

Not only did Virginians disagree about whether or not they should use inoculation, but they also disagreed about the type of method of transferring the disease. The method of transferring the disease varied, as did the means of preparing the patient for transference. An ancient method used by the Chinese was to place dried smallpox scabs in the nose. By inhaling, the disease was transferred. Dr. Richard Mead in England had experimented with this method.[110] Another method advocated by some doctors was to place the patient in direct contact with a person who had a mild form of smallpox. Inoculation, the most widely used method of transference in Europe and America until vaccination, varied according to the amount of the infectious material placed in the incision, the form of smallpox from which the infectious material was taken, and the stage of the disease when the infectious material was transferred. "R. W." included a description of inoculation which he considered a very simple operation.

> It's true there is very little Skill required in the Operation, being nothing more than making an Incision in that Part of each Arm where Issues are generally placed, and conveying into them some of the infectious Matter; but every prudent Person ought to have it done under the Inspection of a Practitioner in Physick, as Accidents may

[105]Duffy, *Epidemics in America*, p. 82.
[106]*Virginia Gazette* (Parks), October 21, 1737.
[107]*Ibid.*, April 13, 1739.
[108]Duffy, *Epidemics in America*, pp. 37-40.
[109]*Virginia Gazette* (Parks), March 12, 1752.
[110]*Ibid.*

> happen which require Judgement. And there ought to be some Regard had to the Quantity of Infectious Matter applied, the common Method of Practice has been, to open a well-ripen'd Pock, of a Person who has had the distinct Kind, and dip in it a Dossil of Lint, which when applied to the Incisions, seldom fails to procure the Disease.[111]

Transferring the disease by inoculation was preferred over the inhaling or direct contact method by most writers in the *Virginia Gazette* although some indicated that all worked. In an extract that appeared in the *Virginia Gazette,* Dr. Bromfield, "surgeon to her Royal Highness the Princess Dowager of Wales, and to St. George's and the Lock hospitals," indicated that inoculation was milder than the direct contact method for taking smallpox. The extract also contained arguments in favor of Thomas Dimsdale's method of preparing patients for inoculation, as opposed to Daniel Sutton's. The main opposition to Sutton was that he did not vary the treatment according to the health and age of the patient.[112]

Bromfield's preparation of the patient for inoculation was very similar to Dimsdale's which later appeared in the *Virginia Gazette.*[113] Their preparation called for emptying the stomach and bowels with several purges, followed by a very light diet free of meat and liquors. Dimsdale started this ten days prior to inoculation and included "preparative powders" consisting of calomel, powder of crab claws, and tartar emetic.[114] John Dalgleish, however, opposed this method of preparation.

> I vex not my young patients with the lancet, purges, meagre diet, etc. previous to inoculation, nor do I seize them afterwards with false potions. If any dreg remains, it can be but a very little; nature imperceptibly dissipates it, or throws it out in a small superficial boil or two.[115]

John Dalgleish, the Norfolk physician, was the most frequent contributor to the *Virginia Gazette* on the subject of medicine. Six lengthy papers and several shorter items were printed between April, 1768, and November, 1770. Smallpox was the exclusive topic of three of the papers while the other three discussed fevers and contagious diseases in general. Dalgleish first tested inoculation in 1760 when smallpox erupted in Petersburg, Virginia. He inoculated twenty persons. All recovered and only a few were left with scars. "I prepared and inoculated the young and old, the healthy and diseased," revealed Dalgleish. By this method the lives of individuals were secured, and the disease more effectually prevented from spreading." Despite his experience, he believed natural contact and inoculation to work the same.[116]

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[111] *Ibid.*

[112] *Virginia Gazette* (Purdie and Dixon), November 12, 1767.

[113] *Virginia Gazette* (Rind), November 30, 1769.

[114] Virginia Gazette (Purdie and Dixon), November 12, 1769; and *Virginia Gazette* (Rind), November 30, 1769.

[115] *Virginia Gazette* (Purdie and Dixon), April 14, 1768.

[116] *Ibid.*

Dalgleish judged that smallpox was "extremely variable as to quantity, which is dependent on the habit of body, constitution of season, &c for in its essence (comparably speaking) it is invariable."[117] Therefore, he recognized four types of smallpox: the distinct or mild form, the coherent in which some die, the constuent in which many die, and the purple in which all die. The constuent, he believed, was the most common and the purple the most rare. With smallpox and similar diseases, since there were many varieties and degrees of illness, Dalgleish thought that one could not always follow formal rules of medicine. In his first paper he stated that "a judicious deviation from formal rules in medicine sometimes proves to a practitioner valuable *desiderata* in the art of healing."[118] Later, he added:

> This is the more extraordinary, as I accomplished my plan in a part of the British dominions where Smallpox is seldom seen and little known; and at a time when I had not so much as heard that any inoculators deviated from the general practice in England, which was published in the **Virginia Gazette** of April 11, 1760, some little time after I inoculated my first set of patients.[119]
>
> In matters of importance we ought to choose what is for the good of mankind, in opposition to opinion and custom. I have already made my respects, not compliments, to my medical masters and instructors, in a former **Gazette** of yours. They cannot be displeased that They have qualified me to deviate occasionally from the theory, and modes of practice, of Hippocrates, of Mead, etc. and even their own, which were fashionable when I attended the medical schools. For instance, I left off judging the state of a case, and taking indications from the pulse principally in malignant fevers; and disregarded the modern doctrine of the septick principal or putrid ferment, finding it not justly founded; and as to the recent practice, in some parts of Europe, of using, or recommending, cold water largely in fevers, it is founded on a mistaken idea that it was necessary to mitigate the smallpox. In this nondescript malady, which was truly malignant, had I filled patients with anti-septicks, or cold water, or covered them with blisters, in the higher degrees of the fever, they would have died under my hands, as they did under others.
>
> Neither these slowly fatal ailments, nor those quickly fatal from infection, are to be subdued by dogmatical laws of human contrivance; they can be guided only by rules which coincide with the laws of nature, and the powers of animal life.[120]

Most of Dalgleish's desires for deviation in treating illnesses concerned inoculation. Evidently, Dalgleish received criticism for these views because he repeatedly restated his position and convincingly defended it. He asserted in a later paper that his reason for "deviating" from the formal rules was "to prevent some patients from dying by my adhering to these rules. Experience . . . has proved me in the right. Think not, however, that I mean by this to cast the smallest reflection on any of my medical masters, or the excellent authors I have read on

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[117]*Ibid.*, November 17, 1768.
[118]*Ibid.*, April 14, 1768.
[119]*Virginia Gazette* (Rind), November 23, 1769.
[120]*Virginia Gazette* (Purdie and Dixon), November 8, 1770.

all the branches of medicine."[121]

The *Virginia Gazette* in January, 1768, reported several cases of smallpox in Williamsburg. On February 4, 1768, James Cooke, mayor of Williamsburg, confirmed the report when he announced that three cases of smallpox had been reported in the town and that two of the three had died.[122] The same day an unsigned letter from Norfolk appeared in the *Gazette* which told what precautions to take to keep smallpox from spreading.[123] The next week Mayor Cooke announced that the disease was "entirely eradicated."[124] Nevertheless, the reports of smallpox were followed by an article opposing inoculation. The author, a certain "M. B.," argued that inoculation kept smallpox alive in the colony and that even the natural deaths from the disease were traceable to the practice. "M. B." concluded that "at best inoculatiaon in this colony is a very stupid as well as destructive practice, unless it could be pursued under strict regulations; which I imagine cannot ever be done so as to prevent the spreading of the infection."[125] A petition to the Virginia House of Burgesses followed, asking that inoculation be stopped, and in November, 1768, an investigating committee recommended regulation of the practice.[126]

A more serious controversy regarding smallpox occurred in Norfolk during the summer of 1768. Apparently, John Dalgleish endeavored to establish an inoculation hospital near Norfolk, but opposition forced him to abandon the plan. This had been in February, 1768, at the same time as the appearance of smallpox in Williamsburg. Later in June, several men from Norfolk requested Dalgleish to inoculate their families, and again strenuous opposition was voiced.[127]

The first account of trouble appeared in the *Virginia Gazette* on August 25, and covered one and one-third pages. It related how Dr. Archibald Campbell had desired to use his plantation for inoculation, but, the danger of inoculation being exaggerated, some of the townspeople threatened to destroy his house. The antagonists agreed that another location was acceptable, but they failed to designate a suitable house for inoculation. After appealing in vain to the magistrates to halt the inoculation, a group of townspeople on June 23 damaged the "doors and windows" of Campbell's plantation. Despite the opposition, Dalgleish inoculated several families at Campbell's on June 25. Immediately, a "mob" marched on the plantation and demanded that the inoculated persons move to the pesthouse. Cornelius Calvert, Campbell, and the others involved agreed to move their families if the pesthouse were put in order, but the assemblage demanded that they leave immediately. Compelling women and children to venture nearly five miles through a rain storm to reach the pesthouse, warranted the writer's condemnation, "Were they men, or monsters in human shape, who have acted thus!"[128]

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[121]*Ibid.*, April 20, 1769.
[122]*Ibid.*, January 21, January 28, February 4, 1768.
[123]*Ibid.*, February 4, 1768.
[124]*Ibid.*, February 11, 1768.
[125]*Virginia Gazette* (Rind), March 10, 1768.
[126]Duffy, *Epidemics in America*, pp. 99-100.
[127]*Virginia Gazette* (Purdie and Dixon), September 1, September 8, 1768.
[128]*Virginia Gazette* (Rind), August 25, 1768.

The following week, Paul Loyal, director of the pesthouse, briefly described the incident at Campbell's, but mainly his writing was a defense of his own action. Although Loyal insisted that he intervened only to help settle the dispute, a correspondent from Norfolk doubted his impartiality.[129] As director of the pesthouse, Loyal proposed a meeting between the opposing groups. He was also to help find a suitable place for inoculation and was to find and list all the persons who had been inoculated.[130]

Three additional articles concerning the incident appeared in the *Virginia Gazette* on September 8. Two of the writers opposed inoculation, and the third was somewhat unclear as to which side he favored. Although they merely restated what had occurred at Campbell's plantation, one did emphasize the cruel treatment of the women and children and condemned the burning of Campbell's house. The one anonymous writer believed that Dalgleish was mainly interested in inoculation because of the great profit he made. He acknowledged that no one could deny the importance of inoculation, but "there is no great mystery in inoculation: The apparent success of Sutton, and some of his contemporaries, must convince them that no great skill in physick or surgery is necessary; nay even butchers, for the small price of threepence, have engaged in it."[131]

In the *Virginia Gazette* in October, 1768, the same month that he wrote his paper on contagious diseases, Dalgleish continued his defense of inoculation. Dalgleish was now under criticism for three incidents of inoculation. The first had been his apprentice, the second a man in Norfolk with smallpox, and the third at Campbell's. Dalgleish explained that he had inoculated his servant in order to have assistance in smallpox cases; besides, he had always inoculated his servants and apprentices "not only without censure, but without approbation, until the last time." In the second case, Dalgleish apparently received permission from the mayor to inoculate, but was "censured severly."[132]

No accounts of the trouble in Norfolk were printed in 1769. The only significant writings on medicine during this year were Dalgleish's three essays. The Norfolk feud was revived in the *Virginia Gazette* in February, 1770, however, in a letter from "A Customer." This person reviewed the events of the incident at Campbell's plantation and severely criticized Dalgleish's essays on smallpox. Regarding Dalgleish's ideas, "A Customer" stated that "to criticise upon nonsense is folly." He added: "Neither Hippocrates, Galen, the great Boehaave, nor any other physician ever pretended to this art [inoculation]."[133] The following month, Dalgleish answered this "vile misrepresentation of facts." Again, he reviewed the events in Norfolk which had occurred nearly two years before.[134]

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[129]*Virginia Gazette* (Purdie and Dixon), September 8, 1768.
[130]*Virginia Gazette* (Rind), August 25, 1768; and *Virginia Gazette* (Purdie and Dixon), September 1, September 8, 1768.
[131]*Virginia Gazette* (Purdie and Dixon), September 8, 1768.
[132]*Ibid.*, October 20, 1768.
[133]*Virginia Gazette* (Rind), February 15, 1770.
[134]*Ibid.*, March 15, 1770.

The last mention in the *Virginia Gazette* of the Norfolk trouble was a letter written by Cornelius Calvert in January, 1772. The conflict had continued after the incident at Campbell's plantation and Calvert related that he had Dalgleish inoculate three of his slaves in 1769. "A snake in the grass, hatched in Barbados," stated Calvert, informed the "General" and the "General" attempted to organize a group to stop the inoculation. "That Day, in the Afternoon," Calvert continued, "Doctor Dalgleish was committed to Jail, and one of the Aldermen knocked down in the Street by two Ruffians; and at Night the Rioters came to my House demanding of me to drop former Suits, and an Indictment that was brought against them, which I refused to comply with." Calvert concluded, "They then broke my Windows, and frightened my Wife and Children, one of whom then lay on her Deathbed."[135]

Calvert countered earlier arguments concerning Dalgleish's greed by stating that it was the "mercenary Views" of the doctors who benefited from the pesthouse that drove them to oppose inoculation. He listed a Mr. Ramsey and a Mr. Taylor as examples of such doctors. Calvert concluded:

> Where Villains can mob their first Magistrate, abuse his Wife and Children, and can get Rioters, Doctors, Magistrates, and a Clerk whose Children have received the Benefit of Inoculation, as Securities for their good Behaviour, it becomes every well meaning good Subject to make it publick. Some may tamely sit down under it: I never shall.[136]

The court dismissed Dalgleish, but a Joseph Calvert was placed in the county jail, and the rioters, Henry Singleton, William Ward, George Crutchit, and John Fise, were convicted, fined, and had to provide bonds of £50 "to keep the Peace, and be of good Behavior, for the Space of a year."[137]

Two other articles appeared on inoculation during the trouble in Norfolk, one favoring and one opposing the process. The first, an extract from an English newspaper, stated that regulation of inoculation by the legislature was necessary. Although inoculation had been proved successful, the practice greatly increased the danger to people not treated, especially the poor. Inoculation also hurt the trade of a town. If practiced, the writer believed, the operation should be removed from towns and conducted in inoculation hospitals.

> Inoculation is so gainful a harvest to apothecaries and surgeons in the country, that I believe one may say, without breach of charity, that they are always inwardly wishing for the smallpox to come into towns where they live; . . . and there may be some just apprehension entertained that the distemper is sometimes purposely introduced into towns, in order to make way for the exceeding gainful practice of inoculation.[138]

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[135]*Virginia Gazette* (Purdie and Dixon), January 9, 1772.

[136]*Ibid.*

[137]The sureties were Joseph Hutchings, Samuel Boush, Maximilian Calvert, Thomas Newton, Sr., John Hutchings, Joseph Calvert, Thomas Newton, Jr., Mr. Ramsey and Mr. Taylor. *Ibid.*

[138]*Virginia Gazette* (Rind), November 17, 1768.

The second article briefly discussed "whether inoculation be permitted by the Divine law?" Since man should preserve life and inoculation had proved helpful in doing that, the writer believed that divine law permitted inoculation.[139]

Several miscellaneous articles appeared in the *Virginia Gazette* concerning smallpox. They included a public notice of smallpox in the family of Benjamin Harrison,[140] opposition to using taxes to build a pesthouse or inoculation hospital in Norfolk,[141] inoculation of Virginia troops,[142] and a notice that no danger to business existed in Williamsburg in 1779 from smallpox.[143] Finally, after the Virginia Burgesses regulated smallpox inoculation, advertisements appeared in the newspaper indicating that some Virginians went to Maryland to be inoculated.[144]

A scattering of articles concerning medicine were printed in the *Virginia Gazette* which did not involve cures or smallpox. For example, readers were informed that a statue in honor of Sir Hans Sloane was erected in the "Physic Garden" at Chelsea, England. Hans Sloane (1660-1753), the first physician to become a baronet, was a founder, secretary, and, at the time this statue was erected in 1737, president of the Royal Society. In addition, he was physician to the King, president of the Royal College of Physicians, and promoter of the "Physic Garden."[145]

A short extract told of discontent among the surgeons in Paris. The trouble occurred between members and non-members of the Academy of Surgery and was the result of the large number of rewards given by Louis XV to the members. The non-members wanted either to open the Academy to all surgeons of Paris or to abolish it. Louis XV, after receiving a petition transmitting these views, exiled eight surgeons and forbade 100 others to lecture at St. Cosmo's school.[146] The scientific societies in Paris remained restricted to people of influence and nobility, and, as a result, many men of science were leaders in renouncing the *ancien regime.*

Three extracts concerned the College of Physicians in London. One told of choosing Dr. Thomas Pellet as president for the third time;[147] the second, of the desire by some members to restrict fellowships to graduates of Oxford and Cambridge;[148] and the third, of the arrest of a Mr. Hilmer for practicing medicine without taking an examination and without being approved by the College of Physicians.[149]

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[139]*Ibid.*, December 14, 1769.
[140]*Virginia Gazette* (Purdie and Dixon), September 24, 1772.
[141]*Ibid.*, May 26, 1774.
[142]*Virginia Gazette* (Purdie), May 16, September 19, 1777; and *Virginia Gazette* (Dixon and Hunter), April 24, 1778.
[143]*Virginia Gazette* (Dixon and Nicolson), February 12, 1779.
[144]*Virginia Gazette* (Rind), July 12, August 30, 1770; and *Virginia Gazette* (Purdie and Dixon), March 17, 1774.
[145]*Virginia Gazette* (Parks), December 2, 1737; and Garrison, *History of Medicine,* p. 389.
[146]*Virginia Gazette* (Hunter), January 2, 1752.
[147]*Virginia Gazette* (Parks), December 16, 1737.
[148]*Virginia Gazette* (Hunter), August 8, 1751.
[149]*Ibid.*, March 12, 1752.

Four announcements of courses offered at the College of Philadelphia were printed on October 17, 1771. The courses included lectures by Dr. Adam Kuhn on *materia medica;* by Dr. William Shippen, Jr., on anatomy, surgery, and midwifery; by Dr. John Morgan on the theory and practice of physic and the causes, symptoms and care of diseases; and by Dr. Benjamin Rush on chemistry.[150]

There were several notices of medical appointments during the Revolutionary War. One told of the appointment of Dr. John Morgan as "director of the hospital, and physician to the American army,"[151] and another mentioned Dr. William Shippen, Jr., as director general of all military hospitals.[152] Another notice announced the appointments of Dr. William Brown of Virginia, Dr. James Craike of Maryland, and Dr. Thomas Bond, Jr., of Philadelphia, as "assistant directors general." Also, Dr. Benjamin Rush of Philadelphia and Dr. Walter Jones of Virginia were appointed "physician and surgeons general of the hospitals of the middle department,"[153] but William Brown replaced Dr. Jones who declined the appointment.[154]

III. NATURAL HISTORY

Excepting medicine, the area of science that most interested Americans in the 18th century was natural history. The age of exploration aroused a strong desire among Europeans and Americans to search the unknown. This interest in strange or unusual plants and animals was illustrated by several descriptions of such fascinations in the *Virginia Gazette*.[1] "Decades and centuries after the initial discoveries, the wonder still remained. New explorations and new knowledge seemed to expand the bounds of the unknown even faster than the limits of the known."[2] Persons who were unable to visit these new localities read about them and the demand for books on natural history increased. Some went a step farther than merely reading.

> As western commerce and wealth increased, the more fortunate Europeans were enabled to enjoy the exhilaration of confronting the New World more directly than by reading about it and more pleasantly than by actually visiting it. These men could revel in the taste of an American bear, realizing that it was an exotic dish beyond the reach of most of their fellow men. They could import dried flowers, or bottled bugs, or chips of stone, and they did all of these things to the gratification of scientists as well as the satisfaction of their own collecting urge. They could also grow gardens of living plants, and these proved to be the most conspicuous means of enjoying the natural riches of the far corners of the earth. The Old

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[150]*Virginia Gazette* (Rind), October 17, 1771.
[151]*Virginia Gazette* (Purdie), November 10, 1775.
[152]*Ibid.*, April 23, 1777.
[153]*Ibid.*, June 27, 1777.
[154]*Ibid.*, July 25, 1777.

[1]*Virginia Gazette* (Purdie and Dixon), October 10, 1771; and *Virginia Gazette* (Rind), February 4, 1768, June 17, 1773.
[2]Hindle, *Pursuit of Science*, p. 11.

> World interest in gardens gave a decidedly botanical tinge to the development of American natural history.[3]

With these almost endless sources of new materials, the work in natural history centered around two activities – collection and classification.

America, with its many new species of flora and fauna, offered interested persons a vast area of study, and during the seventeenth and eighteenth centuries many Europeans traveled to America to investigate the rich state of nature.[4] One such traveler mentioned in the *Virginia Gazette* was Peter Kalm. Kalm, a professor at Abo, Finland, and a former student of Linnaeus, was sent to America by the Royal Academy of Sciences in Stockholm. In an article in the *Gazette* containing a part of a letter from Kalm to a friend in Philadelphia, the Swedish scientist described Niagara Falls. Observing the surrounding plant and animal life, the rock structures, and the falls, Kalm explained: "The Hair will rise and stand upright on your Head, when you see this! I cannot with Words express how amazing this is!"[5] An account of his trip in 1748 was related in *Peter Kalm's Travels in North America* and told of many new and sometimes unusual sights. In 1772, two years after the translation of his work into English, the *Virginia Gazette* printed "An Account of some Vestiges of Cultivation and Antiquity which the French met with in their Attempt to trace out the Passage by Land from Canada to the South Sea, from Professor Kalm." Kalm told of the expedition of Pierre de la Verendrye across Canada and of the discovery of the remains of an Indian civilization far superior to any of the contemporary tribes.[6]

Although Virginians did considerable work in natural history, only one local investigator contributed an article on the subject to the *Virginia Gazette*. This was a paper on the weevil moth by Landon Carter. It included a description of the moth, its life cycle, and the means of preventing the moth from injuring wheat and corn.[7]

Only one other essay on natural history appeared in the available copies of the *Virginia Gazette*. Entitled, "On the Production of a Species of Insects," the essayist, in addition to elaborating on his own knowledge, endeavored to disclose the many interesting curiosities that one could find in the study of insects. The essay provided indications of what was known about insects at the time, especially the "winged Tribe of Insects" or Lepidoptera.[8]

The study of botany and zoology in reference to medicine should not be overlooked. Most study of plants, as seen in the preceding chapter, had as its goal the discovery of new medicinal drugs such as senega; in fact, most scientists of the day did not regard botany as separate from medicine and pharmacy. This was true of the 17th and

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[3]*Ibid.*, p. 13.
[4]*Ibid.*, pp. 11-15.
[5]*Virginia Gazette* (Hunter), May 9, 1761.
[6]Hindle, *Pursuit of Science*, pp. 34-35; and *Virginia Gazette*, (Purdie and Dixon), November 19, 1772.
[7]*Virginia Gazette* (Rind), November 19, 1772.
[8]*Virginia Gazette* (Hunter), October 3, 1751.

most of the 18th centuries, but with the work of such men as Linnaeus and Buffon, botany and zoology began to emerge as separate sciences.[9]

In observing the absence of information on natural history in the *Virginia Gazette,* it is well to recognize that much work was done in the period of 1740 to 1765 when so many of the issues of the *Gazette* are missing.

IV. THE PHYSICAL SCIENCES

A. ASTRONOMY

Most articles in the *Virginia Gazette* on astronomy were printed during the period 1768-1770. This concentration of attention was the result of widespread interest, first in Europe and then in America, over the proposed observations of the transits of Venus. Scientific interest in the transits of Venus of 1761 and 1769 was prompted by the belief that this phenomenon would allow the calculation of the solar parallax or the distance from the earth to the sun. The need to find this distance was very important to scientists of the 18th century who were laboring to fill in particulars of Newton's universe and to make this branch of science as exact as possible. Scientists could use Kepler's Third Law to determine the relative positions of the planets; therefore, if the actual distance from the earth to the sun could be calculated, all planetary distances would be known.

Edmund Halley, the renowned English astronomer of the 17th century, had first explained how to use the transit of Venus to compute the solar parallax. The procedure proposed by Halley for determining the solar parallax was to record the inner contact during ingress and egress of Venus as it crossed the surface of the sun and then to compare the time of duration with other observations. Another accepted variation of Halley's method was that of Joseph-Nicolas Delisle who believed that a comparison from various locations of the time of contact of either the ingress or egress was better. Delisle's method was more applicable than Halley's because a view of the entire transit was not necessary. Thus, there was less chance of weather obscuring part of the transit and there were so many more areas available where partial observation could occur. Both procedures required extremely accurate measurement, both in time and in position of the observation, for any error greatly affected the calculation of the sun's distance.[1]

In addition to determining the solar parallax, the transit was important to scientific development for other reasons. In an attempt to compete with other countries and to further national prestige, the observations of the transits received governmental support in many countries.

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[9]Martha Ornstein, *The Role of Scientific Societies in the Seventeenth Century* (Chicago, 1938), p. 11.

[1]Harry Woolf, *The Transits of Venus, A Study of Eighteenth-Century Science* (Princeton, 1959), pp. vii-20.

"One of the themes most stressed . . . was the competitive and nationalistic aspect of the undertaking."[2] The Royal Society, for example, used this approach when trying to obtain funds from the Lords of the Treasury for an expedition in 1761 to St. Helena.

Moreover, most of the advance information concerning the transits and the results of the many observations were channeled through scientific societies. The two most important socieities in this and most scientific endeavors during this period were the Royal Academy of Sciences in Paris and the Royal Society in London. The French society, as a result of the work of Delisle, was the leading promoter of the transit observation in 1761, but equally important was the contribution of the English in this earlier endeavor and in the 1769 observations.

The important work of the societies in this extensive operation greatly accelerated their growth and prestige for "the number of papers on the value of the solar parallax deducible from the 1769 transit was enormous; about two hundred were sent to the Academie des Sciences, and probably as many as four hundred more to the remaining world-wide scientific bodies."[3] Another important factor resulting from the observations was the increasing cooperation among the scientists of the various countries through an extensive interchange of information and even equipment.

Finally, the expeditions which were arranged to observe the transits gave substantial aid to scientific fields other than astronomy. The South Seas expedition sponsored by the Royal Society, for example, featuring the work of Cook, Solander, and Banks, became equally well-known for its contributions to natural history, navigation, and exploration.[4] It is evident, then, that the observations contributed more to science than merely a more accurate measurement of the solar parallax, As Harry Woolf concluded:

> The range and intensity of activity directly connected with the eighteenth-century transits of Venus were, by contemporary standards, enormous. It is quite likely that no other particular scientific problem in the eighteenth century brought so many interests to a single focus as the concern for the solar distance.[5]

Despite these extensive operations, the *Virginia Gazette* contained no evidence of any American interest in the transit of Venus of 1761. Since the transit of 1761 was not visible in the colonies, only one American team, the group led by John Winthrop that went to St. Johns, Newfoundland, was able to observe the transit.[6]

Much more interest, however, had developed in the American colonies by 1769 when the second transit of Venus occurred and much advance publicity was given to it. This time the transit, although not the entire duration, was visible in the colonies.[7]

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[2]*Ibid.*, p. 81.
[3]*Ibid.*, pp. 189-90.
[4]Hindle, *Pursuit of Science*, p. 147; Woolf, *Transits of Venus*, pp. 179-80; and *Virginia Gazette* (Rind), October 17, 1771.
[5]Woolf, *Transits of Venus*, p. 23.
[6]*Ibid.*, pp. 93-96; and Hindle, *Pursuit of Science*, p. 146.
[7]Hindle, *Pursuit of Science*, p. 146.

> Newspapers throughout the continent were full of the event describing its course, its meaning, and the manner in which individuals could observe it. Everywhere, people collected smoked glasses and anything they could find in the way of magnifying equipment: spy glasses, perspective glasses, and tiny telescopes. Most of them did not bother with time pieces or with the problem of the sun's parallax, but they were anxious to see this rare event about which there was so much concern.[8]

The *Virginia Gazette* provided evidence of the international interest in the transit of Venus in 1769 when it contained an account describing Russian preparations for the observations. On March 3, 1767, in a letter to the Academy of Sciences in St. Petersburg, Catherine II officially initiated Russian participation. Catherine requested the Academy of Sciences to locate the best observation points in the empire and to use expert mariners to observe the transit if too few astronomers were available to carry out the task.[9] Word was received later from Moscow that Catherine had provided 40,000 rubles for the Academy of Sciences to observe the transit at eight different locations in the empire and that preparations were already underway. Because of shortages in Russia, the government was ordering the necessary astronomical equipment from England and France.[10]

Reports in the *Virginia Gazette* of English preparations for the transit were limited to a notice of the outfitting of the ship *Endeavor*. The *Endeavor*, commanded by Captain James Cook, carried an expedition of the Royal Society to the South Seas where members were to observe the transit.[11] In addition, "some Gentlemen of Fortune, who are students in botany," joined the company "upon a tour of pleasure."[12] The expedition included Charles Green, a former assistant at the Greenwich Observatory, Sir Joseph Banks, "a Gentleman of large fortune who is well versed in natural history," and Dr. Daniel Charles Solander, a botanist who had studied under Linnaeus.[13] The departure of the expedition was noted in the newspaper on November 24, 1768,[14] and nothing more was mentioned about the expedition until the *Gazette* printed news of a letter from Banks, dated May 11, 1771, in which he related that they had arrived at their destination in February, 1769, despite the many hardships encountered on the journey.[15]

As part of the attempt to stimulate interest in the transit of Venus throughout the British Empire two articles, by John Page of Rosewell, Virginia, and signed "T. V.," were printed in the *Gazette* in the early

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[8]*Ibid.*, p. 156.

[9]*Virginia Gazette* (Purdie and Dixon), September 17, 1767.

[10]*Ibid.*, February 4, May 12, 1768. Only seven observation stations are listed in Russia by Woolf, although there were more than one in St. Petersburg. The shortage of scientific equipment in Russia is indicated by the shipment of twenty-one telescopes and other equipment to Russia from James Short of London. Woolf, *Transits of Venus*, pp. 180-181.

[11]*Virginia Gazette* (Purdie and Dixon), September 15, 1768; and *Virginia Gazette* (Rind), October 27, 1768.

[12]*Virginia Gazette* (Purdie and Dixon), September 15, 1768.

[13]Woolf, *Transits of Venus*, pp. 167-68.

[14]*Virginia Gazette* (Rind), November 24, 1768.

[15]*Virginia Gazette* (Purdie and Dixon), August 8, 1771.

part of 1769.[16] Page "promised to show what advantages may be derived to astronomy from proper observations on the ensuing transit."[17] These, and most other articles on the transit, were presented to the general reader in what one contributor to the *Gazette* described as "a language quite unintelligible."[18]

In the first article, Page briefly explained Kepler's formula for finding the proportional distances between the planets, and then he attempted to explain the significance of the solar parallax.

> Now the real distance to the sun will be known whenever the sun's horizontal parallax is known. The sun's horizontal parallax is the difference between the sun's place in the heavens, as seen from the centre and surface of the earth, or the difference between his true and apparent place, which is equal to the angle which the semidiameter of the earth subtends at the sun. When this angle is known the sun's distance is easily found, by trigonometry; but it is so small, on account of the sun's great distance from the earth, that the true quantity thereof cannot be estimated by an instrument or determined with the desired exactness by any other method, that has hitherto occurred to astronomers, than by observations on a transit of Venus.[19]

The second essay was a more detailed and complicated paper in which Page described the best locations for observing the transit, how to observe the transit, and procedures on how to use the observations to calculate the solar parallax. Page also included information for observations of the transit in Williamsburg. He used Benjamin Martin's calculations for times of the ingress and the middle of the transit, but because Williamsburg was not properly located for an ideal observation of the transit, observers there would not see the egress. Therefore, with only the ingress available to determine the sun's parallax, observers in Virginia could only use the method of Delisle to compute the parallax, and more importantly, they could use their observations to check the work of others. The more observations, Page believed, the better. Page concluded the article with current estimates of distances scientists hoped to improve. The estimation of the sun's parallax was ten degrees, and, if ten degrees, the distances to the various planets from the sun were Mercury 38,713,000 miles, Venus 72,333,000 miles, Earth 100,000,000 miles, Mars 157,369,000 miles, Jupiter 520,096,000 miles, and Saturn 954,006,000 miles.[20]

One week after the second article by Page, a letter from "X. Y." appeared.[21] "X. Y." affirmed the importance of the transit, but he disagreed with Page on several aspects of observing the transit. Because accurate observations were essential and were very difficult to ob-

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[16]Hindle, *Pursuit of Science*, pp. 155-56, 158, 162-63. Hindle does not mention "T. V.," but attributes three articles to John Page [footnote 38, page 158, — *Virginia Gazette* (Purdie and Dixon), June 1, June 29, and August 3, 1769]. The June 29 and August 3 articles are signed "T. V.," but the June 1 reference was signed by "X. Y." Still, Hindle's description of Page's writings fits "T. V."

[17]*Virginia Gazette* (Purdie and Dixon), March 30, 1769.

[18]*Ibid.*, June 1, 1769.

[19]*Ibid.*, March 30, 1769.

[20]*Ibid.*, May 25, 1769. Woolf (pp. 208-09) observes that if the parallax were ten degrees, the distance from the sun to the earth would be 81,738,420 miles.

[21]*Ibid.*, June 1, 1769.

tain, "X. Y." believed that only the best observations should be made public. "X. Y." also criticized the method of determining the solar parallax offered by "T. V." Although Page had described both the duration and the ingress methods, he believed comparisons of the ingress, which was the only method available to observers in Williamsburg, to be accurate. Calculating the parallax by observing only the ingress or egress had been the main procedure used by observers in 1761, but since then most astronomers considered observation of the total transit a more accurate method. This was the reason for the expeditions to Lapland and the South Seas; the South Sea observation was to provide the shortest duration and the Lapland the longest.[22]

In summary, "X. Y." wrote:

> But there are two particulars in that Gentleman's last piece which are by no means to be overlooked, as they appear to me very erroneous. The first is the method proposed for determining the solar parallax, by observing the beginning only compared with the beginning to an eye placed at the centre of the earth, which must be the calculated central beginning. Now this method, I presume, cannot be depended upon, except the tables upon which the calculation for the central ingress is built can be so, which no astronomers, as far as I can learn, pretend to say, and therefore no single observation whatever is to be looked upon as sufficient for this purpose: . . . .
>
> . . . . the other particular I intend to take notice of; for though the difference in time with us here may be, as he observes, too small to determine the parallax with any precision, by his method in comparing it with the central one, yet it is probable it will answer well, when compared with observations made in other parts of the globe, and therefore it is to be hoped will be carefully, even here, attended to.[23]

A final criticism by "X. Y." was the complexity of "T. V." 's writing:

> Though the intention of your correspondent in last week's, as well as a former paper, to explain this subject, be commendable, that Gentleman will pardon me for saying that such an attempt, in that compass, can answer no other end than show the learning of the writer . . . .[24]

These comments touched off a verbal duel between the two gentlemen. They restated their opinions, each criticizing the other's knowledge of astronomy. Since the exchange occurred after the transit of Venus, much of the debate concerned the reliability of Page's observations, a reliability that "X. Y." seriously questioned. Page apparently was the only Virginian to observe the transit, or at least to announce it publicly, even though the College of William and Mary had the necessary equipment.[25] One point of criticism in particular by "X. Y." was Page's reliance on inaccurate tables to determine his position and the time of the transit in Williamsburg.[26] Indeed, such methods deserved criticism.

In addition to the report by Page, the *Virginia Gazette* carried four other observations of the transit. The first of these, in September, 1769,

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[22]Woolf, *Transits of Venus*, pp. 153, 176.
[23]*Virginia Gazette* (Purdie and Dixon), June 1, 1769.
[24]*Ibid.*
[25]Hindle, *Pursuit of Science*, pp. 162-63.
[26]*Ibid.*, June 29, July 27, August 3, 1769.

was the account of Charles Messier of Paris. Messier, who had been a student of Joseph-Nicolas Delisle, had been unable to observe the initial external contact because of clouds, but he recorded the "second contact" or internal contact of ingress. The article also mentioned Messier's observance of an eclipse of the sun and "eminences" on the edge of the moon.[27] Two short notices concerned the observations of Solander and Banks in the South Seas. The one told of their conference with Sir John Pringle and King George III in which they discussed their discoveries,[28] and the second noted that "Mr. Banks and Doctor Solander have made more curious Discoveries in the Way of Astronomy and National History than at any one Time have been presented to the learned World for the fifty Years past."[29] The fourth report of the transit, from Mannheim, stated that from the observations scientists in that city calculated that the sun was 1,368, ()09 [*sic.*] times larger than the earth and that Venus was in a 23 to 25 ratio to the earth.[30]

In addition to the transit of Venus, other heavenly phenomena attracted attention during the eighteenth century. Sun spots, the northern lights, and especially comets intrigued the curious, but astronomy meant even more to a people who looked to it as proof of an orderly universe.

> To the thinker, astronomy has an importance beyond utility and beyond the mere satisfaction of intellectual curiosity. In a sense, astronomy seemed the key to the wisdom of the ages. The concept of natural law, the rational religion of the time, the faith in human progress, and the swelling comprehension of infinity all seemed somehow to follow from the ordered nature of the heavens with its precisely predictable events.[31]

In the same month as the transit of Venus in 1769, a comet appeared over America. This and another comet that appeared the following summer generated tremendous public interest. Observers throughout the colonies printed frequent reports on the comets, and not to be left out, Virginians, in another series of letters to the *Virginia Gazette*, engaged in a written debate similar to the dispute about the transit.[32] Identitification of the contributors was confusing and the exchanges resulted in numerous denunciations regarding ability and character.

On September 4, 1769, an anonymous writer, observing the comet moving in a path towards the sun, estimated its speed and plotted its probable movement across the sky. The statement that sparked the controversy was his warning that "should it come between us and the sun the tail will then probably extend to the earth, and therefore it becomes all to be prepared for consequences so alarming as those which must then follow."[33]

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[27]*Virginia Gazette* (Purdie and Dixon), September 7, 1769.
[28]*Ibid.*, October 17, 1771.
[29]*Ibid.*
[30]*Virginia Gazette* (Rind), April 23, 1772.
[31]Hindle, *Pursuit of Science*, p. 167.
[32]*Ibid.*, pp. 171-72.
[33]*Virginia Gazette* (Purdie and Dixon), September 14, 1769.

The same day in Rind's *Virginia Gazette* another account of the comet appeared. The writer, who later identified himself as "C. R.," also described the comet and its movement.[34]

Two more articles on the comet appeared in the issue of October 19. The one writer assured the public that any danger from the comet was "about as likely to happen as that the sky should fall." Concluding his condemnation of the two persons who had been writing about the comet, he stated: "Think of this, kind readers, as you ought, and you will not be terrified by the scribbling of every dabbler in astronomy; nor by the ridiculous predictions of your pretenders to astrology, which only tend to fill the world with ignorance and superstition."[35] The second reply, also directed to the article in Rind's *Virginia Gazette* on September 14, and signed by "A. B." was mockingly critical of the "dabblers." "A. B." quipped:

> The author, besides accurately determining its direction, has furnished such excellent materials, and pointed out such clear and easy methods for ascertaining its magnitude, place, and velocity, that I shall conclude X. Y. and T. V., notwithstanding all they have wrote upon "the subject of Venus' transit," know nothing of astronomy, or at least of the "doctrine of comets," if they do not determine them, and afterwards inform us whether this is a new, or an old comet, fix its period, and show us its true trajectory in a type. I almost think the piece was wrote with the design of engaging them in this business, and assisting them in the execution of it, though the great modesty of the author has hindered him from speaking out.

If the "second Newton," as "A. B." referred to the writer, could offer any help to future astronomers, "it may caution them to shut their eyes, when they are taking observations. . . ."[36]

Another reference to the comet and particularly a reply to "A. B." was printed in the newspaper. The writer masterfully hid the meaning of the letter, if it had any, but he appeared to make fun of both "A. B." and "C. R."[37]

A third series of letters to the *Gazette* on astronomy started with another "strange appearance in the Heavens" in 1770. After observing the "luminous bur" [*sic.*] for several nights, "B. E." determined it to be a comet and related his observations to the public. During the first observations, which started on June 26, 1770, the comet moved from east to west, but on July 2, he observed it to move in an oblique to the east and the next night in an oblique to the south. While seeking an explanation of this phenomena, "B. E." also renewed the previous controversy by criticizing "A. B." for his article the year before, and asking, "What is a greater or more condemnable species of folly than an ill-timed flash of wit?"[38]

Several other men entered the debate in the ensuing months. One or more articles are missing here because the writers referred to an article

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[34]*Virginia Gazette* (Rind), September 14, 1769.
[35]*Ibid.*, October 19, 1769.
[36]*Ibid.*
[37]*Ibid.*, November 16, 1769.
[38]*Ibid.*, July 26, 1770.

in the issue of August 2 of the *Gazette* and to several men, such as "The Customer," and no articles by them are in the extant issues. By December when the *Virginia Gazette* printed the last article about the comet, "A. B.," "The Customer," "B. E.," "Another Customer," "The Constant Reader," and two "C. R." 's had participated in the debate concerning the comet and in the more frequent criticism of the other contributors.

The first existing letter after "B.E." 's of July 26, was by "C. R.," who sided with "B. E." and "The Customer" and criticized "A. B." Incidentally, "C. R." admitted that he had written the description of the comet in 1769 that "A. B." had answered with his "false and impertinent wit."[39] In a second letter, "B. E." continued the debate; primarily, he discussed the point in question of the proper way to state the ratio of the comet's velocity referred to in Rind's *Virginia Gazette* of September 14, 1769.[40] This was also the topic of a later article by "B. E."[41] To confuse the debate, a letter from a second "C. R." appeared claiming that the other "C. R." was an impersonator. He claimed that "thus under the fiction of C. R. every reader may as certainly see A. B. and The Customer endeavored to be concealed as if one and the same name had been written to each piece."[42] The first "C. R." countered with evidence that he was the original "C. R." by comparing the writings of several different articles.

> Everyone knows with what sublimity of sentiment, and pompous majesty of style, I described the storm of September 1769, and my observations on the last year's comet bore such manifest marks of astronomical knowledge, and of blushing modesty, as made them deservedly the admiration of all who saw them, one only excepted, and he was A. B.[43]

In October, 1770, "A. B." submitted a friendlier letter to the *Virginia Gazette* in regard to "B. E." He provided information from Europe on the observations of the comet and attempted to explain the reasons for the differences between the date of "B. E." and the Europeans.

> For notwithstanding B. E. has treated me most illiberally, I thought it unjust to suffer him to fall under the imputation of want of abilities as an astronomer, or of inaccuracy as an observer, from the disagreement of his observations with the astronomers, when I could so easily reconcile them and prove that there ought to have been that very difference.[44]

A final article on the comet revealed that "B. E." and the first "C. R." were the same person. "B. E." or "C. R." claimed authorship for the two articles on the comets (September 14, 1769 and July 26, 1770) and for the two articles signed "B. E." and "C. R." (September 13, 1770 and October 25, 1770). He disclaimed, however, writing

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[39]*Virginia Gazette* (Purdie and Dixon), August 30, 1770.
[40]*Ibid.*, September 23, 1770.
[41]*Virginia Gazette* (Purdie and Dixon), October 4, 1770.
[42]*Ibid.*, September 20, 1770.
[43]*Ibid.*, October 25, 1770.
[44]*Ibid.*

the articles by the "fictitious" "C. R." (September 20, 1770) and by the "C. R." and "B. E." in the issues of August 30, and October 4, 1770. Believing that "The Customer" was also the "Other Customer" who had submitted a mild criticism of "B. E." to the *Gazette*,[45] he concluded that neither "A. B." nor "The Customer" had written the other articles signed by "B. E." and "C. R."[46] As is evident, these men spent more time ridiculing each other and arguing about trivia than they did seriously discussing astronomy.

Although often pedantic, at least the numerous articles in the *Virginia Gazette* written by local contributors testified to the widespread and popular interest in astronomy. The longer, more detailed articles were from local contributors such as "T. V.," "X. Y.," "C. R.," and "B. E." Extracts from letters and other newspapers, on the other hand, were generally very short and not in the form of essays.

In one extract, a "very ingenious and eminent philosopher in London" praised David Rittenhouse for his new orrery. The writer said of Rittenhouse: "I had before heard much of his ingenuity; but this is quite wonderful, to be performed by an American, as it seems to exceed anything of the kind that has yet appeared in Europe."[47] A clockmaker with little formal schooling, Rittenhouse was one of the best astronomers in colonial America. Rittenhouse completed his first of several orreries in 1767. The orrery, or model universe, when displayed, was a popular attraction among the people of colonial America, and it nourished the enthusiasm in astronomy generated by the transit of Venus.[48] The observation of a comet by Rittenhouse also appeared in the *Gazette*.[49]

A number of extracts told of incidental astronomical observations. These reported the differences between the times listed in the almanac and the actual rising of the sun;[50] Abbe Rochon's trip to Morocco to observe the eclipse of the moons of Jupiter;[51] an observation in New Haven of the aurora borealis;[52] the appearance of sun spots;[53] the disappearance of the rings of Saturn;[54] an announcement of the conjunction of Jupiter and Venus;[55] the ideal position of Jupiter for observation;[56] and the lateness in the rising and setting of the sun.[57] Other extracts included an announcement by John Bertucci of Ancona, Italy, of a method to demonstrate that the earth and stars are alike;[58] a report by

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[45]*Ibid.*, September 20, 1770.
[46]*Ibid.*, December 13, 1770.
[47]*Virginia Gazette* (Purdie and Dixon), June 9, 1768.
[48]Frederick E. Brasch, "The Royal Society of London and Its Influence upon Scientific Thought in the American Colonies," *Scientific Monthly*, XXXIII (1931), pp. 463-64; Hindle, *Pursuit of Science*, p. 171.
[49]*Virginia Gazette* (Dixon and Nicolson), March 11, 1780.
[50]*Virginia Gazette* (Purdie and Dixon), April 23, 1767.
[51]*Ibid.*, December 10, 1767.
[52]*Ibid.*, August 6, 1772.
[53]*Ibid.*, October 8, 1772.
[54]*Ibid.*, October 14, 1773.
[55]*Virginia Gazette* (Rind), March 31, 1774.
[56]*Virginia Gazette* (Purdie), February 10, 1775.
[57]*Virginia Gazette* (Dixon and Hunter), June 24, 1775.
[58]*Virginia Gazette* (Parks), January 7, 1737.

Monnier of Paris of his observations in Lapland;[59] an announcement of classes by Dr. Long of Cambridge beginning of the "zodiack and great sphere;"[60] a description of l'Abbe de Rochon's improvements in astronomical navigation;[61] and an appeal to observe the beauty of Jupiter.[62]

B. ELECTRICITY

A sporadic study of electricity started in the early eighteenth century and gathered momentum in the 1740's and 1750's. Most early experimenters were fascinated by the strange and little known "electric fluid." Although few understood any of the characteristics of electricity, it became a popular fad in Europe and later in America to present lectures and to demonstrate the sparks and shock that one could produce. Probably, such a lecture by Dr. Adam Spencer introduced Benjamin Franklin to electricity. The lecture may have been only one source of introduction, however, for "electricity was in the air and no alert man could have avoided knowing about it."[63]

Knowledge of Franklin's exploratory experiments and work in the theories of electricity spread quickly.

> Franklin and his associates had embarked upon the study of electricity in 1746 with small knowledge of what had been accomplished in Europe, but in less than five years they had drawn fully abreast of their distant colleagues. Benjamin Franklin in fact 'laid the foundations of modern electrical science' at Philadelphia in the years 1747-49. He conceived and formulated a unified theory of electrical action which explained all known phenomena in terms of a single electrical fluid, and he evolved the terminology to express that theory. More clearly and fully than any of his predecessors he elucidated familiar electrical phenomena and predicated new ones.[64]

Contemporaries of Franklin recognized him as the foremost individual in American science during the eighteenth century.

Unfortunately, for this study, Franklin did most of his scientific work in the 1740's and 1750's, a period in which few issues of the *Virginia Gazette* exist. One short extract told of the Dutch adopting Franklin's method of reducing ocean waves by using oil.[65] Most extant articles in the newspaper concerning Franklin discuss his political activities, although articles in the 1770's also convey the respect held for his scientific achievements. All of the following extracts from the *Virginia Gazette* praised Franklin for his work in science.

> Letters from Paris say: Mr. Franklin, celebrated for the experiments and discoveries in electricity which he made in America, and carried to the utmost degree of perfection, was lately in this city, when the learned and ingenious flocked to see and to converse with him.[66]

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[59]*Ibid.*, May 6, 1737.
[60]*Virginia Gazette* (Rind), February 16, 1769.
[61]*Virginia Gazette* (Purdie and Dixon), September 12, 1771.
[62]*Virginia Gazette* (Rind), October 22, 1772.
[63]Bridenbaugh, *Rebels and Gentlemen*, pp. 322-24; and Hindle, *Pursuit of Science*, pp. 74-75.
[64]Bridenbaugh, *Rebels and Gentlemen*, p. 326.
[65]*Virginia Gazette* (Purdie), June 30, 1775.
[66]*Virginia Gazette* (Purdie and Dixon), February 11, 1768.

* * *

To steal from Heaven its sacred fire he taught,
The arts to thrive in savage climes he brought;
In the new world the first of men esteem'd;
Among the Greeks a god he had been deem'd.[67]

* * *

They write from Paris that the Royal Academy of Sciences there have elected Dr. Franklin, of Philadelphia, to fill the Vacancy made among their foreign Members by the Death of Baron Van Swieten, and that the King has approved and confirmed their Choice. There can be but eight of those foreign Members by the Constitution of the Academy; and as they are generally of the most distinguished Names for Science in the different Parts of Europe, the Honour of being enrolled among them is in higher Estimation.[68]

In answer to a criticism of Franklin by Alexander Wedderburne, the following appeared:

. . . a Man who is by his Learning an Ornament to his Country . . . and whom all Lovers of Science respect, however they may differ from him in their political Opinions. Dr. Franklin is perhaps the Person of the Age to whom philosophical Knowledge is most indebted. All our capital and sound Notions on the interesting Subject of Electricity were hinted by him, and, which is no small Increase of the Merit, he has himself improved most of his Hints. He first had the grand and bold Thought of seeking among his electrical Globes for the Cause and Manner of the Formation of that awful Phenomenon, Lightning; and by discovering the Secret of Nature, and showing us how to exhaust and dissipate her formidable Shafts, he has provided for the Safety of Mankind, effected what was deemed even impious for Man to atempt, and completed the greatest Discovery of the Age.[69]

The extract of a letter from Paris stated:

When Dr. Franklin appears abroad it is more like a publick than a private gentleman, and the curiosity of the people to see him is so great, that he may be said to be followed by a genteel mob. A friend of mine paid something for a place at a two pair of stairs window to see him pass by in his coach, but the crowd was so great that he could but barely say he saw him.[70]

Part of a letter from Father Beccaria to Joseph Priestly also praised Franklin.

'I am sorry that the political world, which is very transitory, should take the great Franklin from the world of nature, which can never change or fail.' I own it is with peculiar pleasure, that I quote this passage, respecting this truly great man, at a time when some of the infatuated politicians of this country are vainly thinking to build their wretched and destructive projects on the ruins of his established reputation; a reputation as extensive as the spread of science itself, and of which it is saying very little indeed, to pronounce that it will last and flourish, when names of his enemies shall be forgotten. [Extract from the preface of first volume of Priestly on air.][71]

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[67]*Virginia Gazette* (Rind), June 2, 1774.
[68]*Virginia Gazette* (Purdie and Dixon), November 5, 1772.
[69]*Ibid.*, May 5, 1774.
[70]*Virginia Gazette* (Purdie), December 12, 1777.
[71]*Virginia Gazette* (Dixon and Hunter), July 25, 1777.

The following article played on Franklin's scientific reputation in order to comment on political conditions.

> We are well assured that Dr. Franklin, whose knowledge in philosophical sciences is universally allowed, and who has carried the powers of electricity to a greater length than any of his contemporaries, intends shortly to produce an electrical machine, of such wonderful force, that, instead of giving a slight stroke to the elbows of fifty or an hundred thousand men, who are joined hand in hand, it will give a violent shock even to nature herself, so as to disunite kingdoms, join islands to continents, and render men of the same nation strangers and enemies to each other; and that, by a certain chymical preparation from oil he will be able to smooth the waves of the sea in one part of the globe, and raise tempests and whirlwinds in another, so as to be universally acknowledged for the greatest physician, politician, mathematician, and philosopher, this day living.[72]

One phase of Franklin's scientific work that received attention in the *Virginia Gazette* was his experiments to prove that lightning and electricity were the same. People had assumed that the two were the same for some time, but "what distinguished Franklin from his predecessors was the fact that he was able to design an experiment to test his hypothesis."[73] The first experiment proposed by Franklin was to place atop a building an insulated "sentry-box" with a pointed iron rod extending up from the box. Franklin believed that he could attract "fluid" from the clouds and then with this "fluid" perform all the experiments designed for electricity. Franklin never atempted the experiment, but he confirmed his hypothesis by trying a similar venture with a kite in June, 1752. The experiments and ideas of Franklin and his companions in Philadelphia were printed in *Experiments and Observations on Electricity Made at Philadelphia in America* and received an immediate, enthusiastic response.[74]

In 1752, soon after Franklin's experiments became public, five articles appeared in the *Virginia Gazette* relating to electricity. The first, an extract from Paris, told of two "electrical Experiments performed by our most consummate Naturalists, in Pursuance of those by Mr. Franklin, in Philadelphia, to find whether the tonitruous and electrical Matter be not analogous . . . ." In the first experiment, which was the first attempt to use Franklin's "sentry-box" experiment, Monsieur D'Alibard placed an iron bar forty feet in the air and during a storm drew sparks from the bar. A Monsieur de Lor performed a similar experiment, but he placed the iron bar ninety-nine feet in the air and inserted the attached wire in rosin. No storm was occurring during this test, but when a cloud passed over the iron bar de Lor was able to draw sparks from the wire. Both experiments, the article explained, "evince that Thunder Clouds may be deprived of their Fire by Iron Bars fashioned and fixed as above."[75]

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[72]*Virginia Gazette* (Purdie), December 12, 1777.

[73]I. Bernard Cohen, "Benjamin Franklin," *Lives in Science* (New York, 1957), p. 118.

[74]Bridenbaugh, *Rebels and Gentlemen,* pp. 323-326; Cohen, "Benjamin Franklin," pp. 112-19; and Hindle, *Pursiut of Science,* pp. 77-78.

[75]*Virginia Gazette* (Hunter), October 27, 1752.

The second article told of a similar experiment by several members of the academy in Bologna. In their attempt to draw electricity out of the sky by an iron rod, one man held the iron rod in his right hand, the second held a chain attached to the rod with both hands, and the third placed a silk string attached to the chain on his head. Each received a different "concussion" in different parts of the body.[76]

The final three articles on electrical experiments appeared in the *Virginia Gazette* on December 15. One told of an iron cross on a church steeple that glowed during storms. The other two related experiments by a Monsieur Torre who also successfully drew sparks from an iron rod during a storm and by a Monsieur le Noine who attracted electricity from the air without a rod. Monsieur le Noine merely stood on a cake of rosin, raised his hand over his head, and when an extremely heavy cloud passed over he was able to transfer a "most violent shock" to a person who touched him.[77]

A sidelight of Franklin's experiments, yet very important for the practical application of his knowledge of electricity, was the development of the lightning rod. Franklin publicly announced the idea and gave directions for its construction in *Poor Richard's Almanack* in 1753.[78] Lightning rods became widely used despite opposition to them that continued for many years. Opposition was based on religious principles and on the belief that they attracted more lightning than they repelled.

Five articles in the *Virginia Gazette* cited examples and provided proof that people should use lightning rods. These included evidence of the need for rods on houses and a warning to use heavy wire to conduct the electricity,[79] an announcement of the beneficial use of lightning rods in Boston,[80] an account of a storm that proved the need for as many lead-off wires as rods,[81] an account of a successful experiment with lightning conductors aboard a ship,[82] and a detailed description of how to install lightning rods.[83]

Before lightning rods, the first practical application of electricity had been in medicine where experiments sought to cure paralysis.

> Although Franklin on occasion participated in such therapy, he did not believe that the shock itself ever cured a case of paralysis. With shrewd psychological insight, he guessed that the reported cures arose from the desire of the patient to be cured rather than from the passage of electrical fluid.[84]

A scientist from Stockholm reported a series of cases in which he used electricity to cure deafness, toothaches, muscular disorders, arthritis, and lameness.[85] In London, "two or three strokes in the mouth" successfully

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[76]*Ibid.*, November 17, 1752.
[77]*Ibid.*, December 15, 1752.
[78]I. Bernard Cohen, *Benjamin Franklin: His Contribution to the American Tradition* (Indianapolis, 1953), p. 199.
[79]*Virginia Gazette* (Hunter), September 19, 1755.
[80]*Virginia Gazette* (Purdie and Dixon), August 27, 1767.
[81]*Ibid.*, September 27, 1770.
[82]*Ibid.*, April 23, 1772.
[83]*Ibid.*, February 19, 1767.
[84]I. Bernard Cohen, "Benjamin Franklin," p. 124.
[85]*Virginia Gazette* (Hunter), March 14, 1755.

cured a woman who had lost her speech and suffered from fits.[86] Another article related using an electrical shock to cure tongue palsy.[87] Advertisements in the Virginia Gazette also described public demonstrations of the uses of electricity in healing. Such public lectures or shows on electricity were extremely popular in colonial America. A Seneca chief, Kayashuta, for example, was so fascinated by electrical experiments in Philadelphia that he returned in hope of seeing more "thunder and lightning produced by human art," and of attending Ebenezer Kinnersley's lectures on electricity at the College of Philadelphia.[88]

Surprisingly, despite all the popular interest, only two articles were in the *Virginia Gazette* that in any way attempted to explain the nature of electricity. Both were by John Winthrop, a professor at Harvard, a member of the Royal Society, and the outstanding scientist from New England during the colonial period.[89] In his articles, which were similar in content, Winthrop crediting Franklin for fully indentifying lightning and electricity, described electricity as a "subtle and extremely active fluid, diffused thro' all bodies."[90] Concerned with the practical application of Franklin's discoveries regarding conduction and lightning rods, Winthrop explained:

> Electricity may be accumulated in some above its natural quantity, and in others diminished below it. Bodies in the former case are said to be electrified, positively; in the latter negatively. So long as the electric fluid remains distributed in its natural state, it produces no sensible effects; but when it is unequally distributed, its operations are very manifest. When it is accumulated in any body, it endeavours to throw itself out into any neighbouring body which has less than its state; and that, with a violence proportioned to the inequality of the distribution and the quantity to be discharged. The discharge is attended with a flash, a report, and, if the quantity be large, the rending, melting or firing the body into which the discharge is made . . . .[91]

Winthrop believed that the theory of lightning was the "capital discovery of the present age." After explaining the nature of electricity and the properties of conductors, Winthrop concluded his essay with a description for the construction of lightning rods and cited several incidents of their use.[92]

C. MISCELLANEOUS

With the exception of electricity, there was little else concerning physics and only one mention of chemistry in the *Virginia Gazette*. One brief extract told of the establishment of a laboratory "for the Use of his Royal Highness the Duke, who is going thro' a Course of Chymistry, under the Direction of Dr. Shaw."[93]

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[86]*Virginia Gazette* (Purdie and Dixon), May 23, 1766.
[87]*Virginia Gazette* (Hunter), September 19, 1751.
[88]*Virginia Gazette* (Purdie and Dixon), December 3, 1772.
[89]Brasch, "The Royal Society of London," pp. 453, 457.
[90]*Virginia Gazette* (Rind), August 11, 1768.
[91]*Ibid.*
[92]*Ibid.*, September 6, 1770.
[93]*Virginia Gazette* (Parks), July 21, 1738.

Three essays constituted the remainder of information printed in this general category and the first of these was more of a discourse against excessive drinking than a scientific essay. The writer, attempting to explain "a Womans being burnt to Ashes after a very extraordinary Manner," suggested that a human body can catch fire from heat developed by body movements. The writer warned against saturating the body fluids with "spirits" because the beating of the heart might act as "Flint and Steel upon Tinder, [and] at once cause a general Conflagration!"[94]

The second essay was a well written account of the nature of dew. The writer related three experiments that he had performed to prove that dew came from the ground and not from the upper air. The three experiments were similar; in each, he placed a cloth or piece of glass on one level or on different levels and observed that the lower surface of the lower objects became wet first.[95]

The third essay, a "Dissertation on the Four Elements," covered almost an entire page and was one of the most effectively written scientific articles in the *Virginia Gazette*. Although primarily concerned with the "nature and properties of bodies," the writer, "Philalethes," also praised the philosophy of his age. Reason and experimental observation, which he claimed the ancients had used only in a limited degree, had been entirely lost until recently revived.

> A couple of centuries are scarce elapsed since the clouds of prejudice, which had so many years possessed the hearts of mankind, began to subside, and people were convinced that no vague hypothesis would lead them to the true knowledge of natural philosophy; accordingly they had recourse to experiments, and it is found that more discoveries have been made of late, since that method was introduced, than in the many preceeding ages.[96]

Still, "Philalethes" credited the early scientists for their knowledge of the "doctrine of atoms." According to this doctrine, earth, air, fire, and water were the four elements to which all matter could be decomposed—these were the basic elements. Most of the essay described the common properties of the four elements; attraction, of which there is cohesion, gravitation, electricity, and magnetism; mobility, the ability to change places; inactivity or inertia, the "tendency of matter to remain in its state, either of motion or rest;" solidity, the ability to "possess some place;" extension, the amount of space occupied by a body; and divisibility, the ability to be separated without changing the matter.[97]

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[94]*Ibid.*, June 24, 1737.
[95]*Virginia Gazette* (Hunter), October 3, 1751.
[96]*Virginia Gazette* (Rind), March 4, 1773.
[97]*Ibid.*

V. SCIENTIFIC SOCIETIES

Important though newspapers were as a popular vehicle for the dissemination of interesting scientific information to the public, for several reasons they were unsatisfactory as a means of spreading such information among serious scientists. In answer to that need the scientific societies appeared, first in Italy, England, and France in the 17th century.[1] Their value established, the societies by the end of the 18th century had spread to most western countries and came to occupy an indispensable position in the improvement of science.[2] Societies were essential for their stimulation of scientific work and research, for the collection and distribution of scientific information, and for attaining a dignified and intellectual environment in which scientists, and those interested in science, could best work.[3] The most important of these societies, at least in relation to 18th century American science, was the Royal Society of London.[4]

One major article appeared in the *Virginia Gazette* concerning the Royal Society. In it, the council of the Royal Society expressed its appreciation to the King for his patronage and for his establishment of a new "Order of Knights Companions of the Royal Society." The article then related the history of the Royal Society. Starting in 1651 and receiving its charter from Charles II in 1662, the society by 1773 had an impressive membership that included 450 corresponding members. Those members listed were D'Alembert, Linnaeus, Buffon, Bonnet, Euler, Jussieu, Bernouilli, Maison, La Nauze, Ulloa, Baron Van Swieten, Voltaire, and the kings of Prussia and Poland.[5]

A number of shorter extracts about the Royal Society were also printed in the *Gazette*. These included the announcement of the translation into French by de Bremont of the *Philosophical Transactions* of the Royal Society;[6] of a prize for the best answer to Rousseau's "Discourse against Re-Establishment of Arts and Sciences;"[7] of the election of the Polish king to membership in the Royal Society;[8] of the death of Francis Fauquier, Lt. Governor of Virginia and Fellow of the Royal Society;[9] of the election of Benjamin Franklin to the council of the Society;[10] of a meeting of the Society at which Sir John Pringle was elected president;[11] and of the presentation to the Society of a "monster's

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[1]The work of these societies in reference to astronomy is discussed in the preceding section.

[2]Michael Kraus, "Scientific Relations Between Europe and America in the 18th Century," *Scientific Monthly*, LV (September, 1942), pp. 260-61; and Ornstein, *Scientific Societies in the Seventeenth Century*, pp. 73 91, 139.

[3]Brasch "The Royal Society of London," p. 337.

[4]See *Ibid.*, pp. 336-55, 448-69; and Margaret Denny, "The Royal Society and American Scholars," *Scientific Monthly*, LX (November, 1947), pp. 415-27.

[5]*Virginia Gazette* (Purdie and Dixon), June 10, 1773.

[6]*Virginia Gazette* (Parks), June 30, 1738.

[7]*Virginia Gazette* (Hunter), November 7, 1751.

[8]*Virginia Gazette* (Purdie and Dixon), March 26, 1767.

[9]*Ibid.*, March 3, 1768.

[10]*Ibid.*, May 26, 1768.

[11]*Ibid.*, March 11, 1773.

head" from China that turned out to be an ox skin stretched over a "large Cocoa Nut."[12]

Another of the important scientific societies during the eighteenth century was the Royal Academy of Sciences in Paris. The *Virginia Gazette* reported the arrival in Stockholm and the reception by the King of an expedition sponsored by the Royal Academy of Sciences to travel to the North Pole "to discover the True Form of the Earth."[13] The newspaper also announced the awards of the Academy's medals for 1738 and 1739; they were for 1738, "Of the Darkness and Transparency of Bodies" and "The Cause of the Fertility of the Earth;" and for 1739, "Whether the Air we breathe in goes into the blood?" and "Of the Cause of Heat and Cold in Mineral Waters."[14] Other brief extracts concerning the Royal Academy of Sciences told of its expedition to Peru,[15] the presentation of six mariner's compasses to the Society to help determine longitude at sea,[16] the approval of a rust preventative by the Academy,[17] the testing of instruments by the Marquis de Courtenvaux for finding longitude at sea,[18] and the demonstration by J. A. de Rue before the King and Queen of England of an instrument to "find exactly the height of objects inaccessible."[19]

The *Virginia Gazette* mentioned many other European societies. These scattered articles informed the readers of the formation of the Society for Encouragement of Learning in London in 1736;[20] of an attempt by the Academy of Belles Lettres in Amiens, France, to demonstrate that England was once part of the continent;[21] of the formation of the Academy of Sciences in Corsica by a French army officer;[22] of the study of hemp, a mechanical lift, and cattle feed by the Society of Arts in London;[23] that the Academy of Sciences and Belles Lettres in Mantua had anounced that its prize question for 1768 was, "What is the most simple method of uniting the security of provisions with the freedom of commerce and the exportation of grain?;"[24] of the establishment by the King of prize funds for the Society of Sciences in Copenhagen;[25] and that the Academy of Sciences, Belles Lettres, and the Arts, in Lyons, had announced that its prize question for 1776 was, "Whether the electricity of the atmosphere has any influence on the human body?"[26]

As the popularity of scientific societies increased, attempts commenced to establish such a society in the English colonies of America.

[12]*Virginia Gazette* (Dixon and Hunter), September 23, 1775.
[13]*Virginia Gazette* (Parks), October 29, 1736.
[14]*Ibid.*, February 24, 1738.
[15]*Ibid.*, July 7, 1738.
[16]*Virginia Gazette* (Purdie and Dixon), May 20, 1773.
[17]*Ibid.*, July 28, 1774.
[18]*Ibid.*, September 17, 1767.
[19]*Virginia Gazette* (Rind), November 4, 1773.
[20]*Virginia Gazette* (Parks), October 22, 1736.
[21]*Virginia Gazette* (Hunter), June 27, 1751.
[22]*Ibid.*, August 8, 1751.
[23]*Virginia Gazette* (Purdie and Dixon), March 7, 1766; June 4, 1767; and November 29, 1770.
[24]*Ibid.*, May 12, 1768.
[25]*Virginia Gazette* (Rind), May 26, 1768.
[26]*Virginia Gazette* (Purdie), February 10, 1775.

In 1743, Benjamin Franklin initiated the forerunner of what was to become the most important scientific society in early America, the American Philosophical Society. Like most early societies in America, interest and participation soon lessened and the organization ceased to function.

In 1770, an extract from the minutes of the American Society held at Philadelphia for Promoting and Propagating Useful Knowledge described a new machine for pumping water from ships.[27] The American Philosophical Society, Held at Philadelphia, for Promoting Useful Knowledge was formed in 1768 as a result of a merger between two existing Philadelphia societies, one of which was the American Society just mentioned. Because most important American workers in science became members of the American Philosophical Society, it soon formed the nucleus of scientific activity in America.[28]

The *Virginia Gazette's* first article concerning the American Philosophical Society was a short extract from Glasgow. It reported that news had reached Scotland of the progress of the Society:

> This is the first literary Establishment beyond the Atlantick Ocean, and gives a striking Proof of the Greatness and Prosperity of our Colonies, for Men seldom or never form themselves into Societies of that Kind where Ease and Affluence are not eminently enjoyed.[29]

Another article, in 1774, told of the election of new members to the American Philosophical Society.

> We are requested to insert the following. At a meeting of the American Philosophical Society, on Friday the 21st instant, the following new members were elected: The right honourable the earl Stanhope, the honourable lord Mahon, and Samuel Moore, esquire, of London. The honourable John Ellis, esquire, the honourable Bryan Edwards, esquire, and doctor William Wright of Jamaica. Bernard Roman, esquire, and George Gould, esquire, of Pensacola. Doctor James M'Clurg, and doctor Walter Jones, of Virginia. John Jones, esquire, of Maryland. Doctor William Bryan, and doctor Jonathan Elmer, of New Jersey. Doctor John Perkins of Boston. Messieurs James Bringburst, Benjamin Morgan, Sharp Delany, and doctor Thomas Bond, of Philadelphia.[30]

Part of a speech by Benjamin Rush before the American Philosophical Society also appeared in the *Virginia Gazette*. Although entitled, "On the natural History of Medicine among the Indians, and a comparative View of their Diseases and Remedies with those of civilized Nations," the extract in the *Gazette* contained very little on diseases among Indians; instead, it primarily discussed the welfare and development of America.[31] The final mention of the American Philosophical Society concerned the appointment of a committee to study the effects of the "severe and long continued" winter of 1779.[32]

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[27]*Virginia Gazette* (Purdie and Dixon), February 22, 1770.
[28]Brasch, "The Royal Society of London," pp. 450-51; Bridenbaugh, *Rebels and* Gentlemen, pp. 334-39; and Hindle, *The Pursuit of Science*, pp. 73-74, 121-39.
[29]*Virginia Gazette* (Purdie and Dixon), February 11, 1773.
[30]*Virginia Gazette* (Rind), March 17, 1774.
[31]*Virginia Gazette* (Purdie and Dixon), July 21, 1774.
[32]*Virginia Gazette* (Dixon and Nicolson), April 8, 1780.

Of local interest to the readers of the *Virginia Gazette* was a society, founded in Williamsburg in May, 1773, under the leadership of eight men, particularly John Page, and named the Virginia Society for Promoting Useful Knowledge.[33] The first information concerning it was a notice which appeared in the *Virginia Gazette* that a Philosophical Society of one hundred members had formed "for the Advancement of Useful Knowledge in this Colony." Officers for the group were John Clayton, president; John Page, vice-president; Samuel Henry, secretary; St. George Tucker, assistant secretary; and David Jameson, treasurer.[34]

Soon after the founding of the society, the members submitted their objectives to the public.

> The Object of their Hopes is to direct the Attention of their Countrymen to the Study of Nature, with a View of multiplying the Advantages that may result from this Source of Improvement. . . . It is therefore the Intention of this Society to rescue from Oblivion every useful Essay, and they hope that the Efforts of their Members will furnish them with a Collection which may at once both amuse and instruct.
>
> . . . Hence, those who are engaged in different Pursuits may receive from the casual Observation of others such Information respecting their own Inquiries as might otherwise have escaped their Attention.
>
> . . . Virginia furnishes a Field both spacious and almost untrodden. Who can tell what may accrue to the Inhabitants from an Acquaintance with the Nature and Effects of the Climates and Soils? The Minerals, Fossils, and Springs, in which the Country abounds, may yield the greatest Emolument both to their Owners and the Publick. The Multiplicity of Vegetables and Animals may conduce to the Purposes of Commerce and the Comforts of Life, in Modes with which, at present, we are not acquainted.[35]

In an attempt to illustrate the importance of the new society and to obtain public support for it, "Academicus," in August, 1773, cited examples of the work of other societies in promoting the pursuit of knowledge and listed various contributions that the society could make in Virginia to agriculture, commerce, navigation, and natural history.[36]

In the elections held by the Virginia Society during its second year, John Page was president; George Wythe, vice-president; James Madison and Robert Andrews, secretaries; David Jameson, treasurer; and James Madison, curator. At the same meeting the members voted a reward and medal to John Hobday for his threshing machine.[37] This was the first medal awarded by an American scientific society for a practical invention, and for the Virginia Society it was the only concrete evidence of any accomplishments.[38]

John Page, writing in May, 1777, on the fourth anniversary of the society, noted the decline in importance of the Virginia Society for Pro-

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[33]Hindle, *Pursuit of Science*, pp. 213-14.
[34]*Virginia Gazette* (Purdie and Dixon), May 13, 1773.
[35]*Ibid.*, July 22, 1773.
[36]*Ibid.*, August 5, 1773.
[37]*Ibid.*, June 16, 1774.
[38]Hindle, *Pursuit of Science*, pp. 213-15.

moting Useful Knowledge. The society had met for the first time in two years and had decided that because of the war and the difficulty of getting a large group together a committee of nine should carry on the business of the organization and should select papers for a journal which the society hoped to print at an early date.[39] This meager effort however, was not enough to revitalize the organization.[40]

CONCLUSION

The *Virginia Gazette* contained a variety of articles on scientific subjects. These ranged from scholarly essays to short notes, and most areas of science were covered. The printers of the *Gazette* included in their newspapers whatever news was available. Thus, the absence of extensive material on hand accounts for the neglect of the work of many 18th-century scientists, especially those who were non-English. Another important reason for a scarcity of reports on some scientific affairs in this study of the *Gazette* is the large number of missing issues. As noted earlier, except for the years 1745, 1746, 1751, 1752, and 1755, the issues of the *Gazette* from 1740-1765 are almost entirely missing. During this period Benjamin Franklin did his important scientific work with electricity. Also, the gap of missing issues possibly accounts for some of the lack of articles on natural history. During this period, for example, John Clayton had printed his *Flora Virginica*, a description of the plants of Virginia, and in Europe Linnaeus was developing his new system of classification.

The letters and essays submitted to the *Virginia Gazette* by local contributors constituted a major part of the articles on science, especially in the areas of astronomy and medicine, and such articles were generally of greater length than extracts from outside Virginia. Most local writers had a complex and poorly organized style of writing. They repeatedly had a difficult time restricting themselves to their given topics. Often their articles manifest pedantry or a one-sided discussion of a particular topic. The articles by John Tennent, John Dalgleish, "T. B.," and "X. Y.," and the numerous writers on the comets of 1769 and 1770 are good examples of these deficiencies.

The newly developing society and the concern for life account for the numerous articles on medicine. Concentrated in the periods 1737-1738 and 1768-1772, the articles on smallpox and inoculation coincided with outbreaks of the disease in Virginia. Although Virginia had comparatively little trouble with smallpox, the threat of the disease caused great alarm, as was seen in the trouble in Norfolk where few cases of smallpox actually were involved.

Of the many "cures" printed in the *Virginia Gazette*, very few were by men whose work survived the judgment of later generations. Most

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[39]*Virginia Gazette* (Purdie), May 16, 1777.
[40]Hindle, *Pursuit of Science*, p. 215.

were quacks. Although their cures now seem absurd and even repulsive, many persons were convinced that these practitioners performed meritorious service. The writings of the quacks in the *Virginia Gazette* always appeared to be very persuasive, however, because successful cures and testimonials were listed and an assurance of the writers' knowledge backed the claims.

Aside from medicine, the *Virginia Gazette* did not provide a thorough or representative picture of scientific investigation in the 18th century. There were few articles on astronomy other than those on the transit of Venus in 1769 and the comets of 1769 and 1770. The writings on the transit in 1769 were evidence of its importance to the 18th-century astronomer, and the attempts by Virginians to create interest in the transit testified to the widespread attention devoted to the event. Few issues of the *Gazette* are available in 1761, but most likely, few if any articles on the first transit appeared in the *Virginia Gazette*, because it was not visible in the colonies, little organization existed, and scientists directed only limited attention to the earlier event as compared to that expressed in 1769.

Although no accounts of his work appeared in the *Virginia Gazette*, the articles on electricity mainly concerned experiments based on the investigations of Benjamin Franklin. John Winthrop's two articles on the theory of electricity certainly were among the best written and most informative articles found in the *Gazette* on science. These two articles and the "Dissertation on the Four Elements" provided a good view of the status of the physical sciences in the 18th century.

The lack of any discussion of chemistry in the *Virginia Gazette* is understandable since men such as Lavoisier and Priestley did not initiate modern chemistry until the 18th century and most of the controversy that developed came after 1780.

The area of science about which surprisingly little appeared in the *Virginia Gazette*, however, was that of natural history. For a society with such a great interest in collecting and classifying materials and in discovering more about its surroundings, very little evidence of such an interest appeared in the *Gazette*. At the same time, however, Europe printed many American works on natural history, a field in which many untrained persons in America participated and served merely as collectors for scientists in Europe. Nevertheless, Linnaeus and the other outstanding Europeans in botany during the 18th century are not fully represented in the *Virginia Gazette*. Even Virginians, such as John Clayton and John Mitchell, who had gained the respect of European scientists do not have their works mentioned in the *Gazette*. Again, very likely, this neglect is attributable to the missing issues during the time of much of their work.

In conclusion, the *Virginia Gazette* provided no continuous coverage of events in science, yet it encompassed enough information to give its readers a limited treatment of certain scientific developments. The articles, which were extracts or short accounts, did not have the completeness of a pamphlet or a journal, but for scientific information they probably served the lay community better than the longer and more complicated treatises.