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A SUGGESTION CONCERNING JAMES SMITHSON'S CONCEPT OF "INCREASE AND DIFFUSION"

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In 1826, at the age of sixty-one, James Smithson prepared his will. He left his family fortune to his nephew and provided for one last contingency: Should the nephew die without an heir, Smithson bequeathed his fortune "to the United States of America, to found at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of Knowledge among men." Smithson died in 1829, the nephew died heirless in 1835, and in due course the bequest became the property of the contingent residuary legatee. From the very beginning there was disagreement about Smithson's intent, and historians, failing in their efforts to ascertain its basis, have characteristically treated Smithson as a beneficent enigma.[1]

To be sure, events conspired to obscure an understanding of Smithson's thoughts. Eight years passed between his death and the

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[1]Unfortunately, a satisfactory history of the Smithsonian Institution has not yet been written. The best discussion of events leading to its organization may be found in Hunter Dupree, *Science in the Federal Government: A History of Policies and Activities to 1940* (Cambridge, Mass., 1957), pp. 66–90. The basic book-length studies of Smithson are Leonard Carmichael and J. C. Long, *James Smithson and the Smithsonian Story* (New York, 1965), and William J. Rhees, "James Smithson and His Bequest," *Smithsonian Institution Miscellaneous Collections*, vol. 330 (1880). The latter is bound with vol. 327, an appendix of Smithson's twenty-seven scientific papers reprinted from the *Transactions of the Royal Society* and Thompson's *Annals of Philosophy*. For glimpses of Smithson, see *Increase and Diffusion: A Brief Introduction to the Smithsonian Institution* (Washington, D.C., 1975), p. 9; Geoffrey T. Hellman, *The Smithsonian: Octopus on the Mall* (Philadelphia, 1966), pp. 34–35; Wilcomb E. Washburn, ed., *The Great Design: Two Lectures on the Smithson Bequest by John Quincy Adams* (Washington, 1965), p. 13; Harry Edward Neal, *Treasures by the Millions: The Story of the Smithsonian Institution* (New York, 1961), pp. 17–19; and Paul H. Oesher, *Sons of Science: The Story of the Smithsonian and Its Leaders* (New York, 1949), pp. 1–13.

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announcement in 1837 of his gift to the United States. When the English Court of Chancery and American envoy Richard Rush successfully settled the inheritance in 1838, Rush gathered Smithson's excellent mineralogical cabinet, his personal effects, and his papers—which, with the exception of the will, failed to mention Smithson's institutional plan.[2] As an indication of the extent of Smithson's obscurity even after the establishment of the Smithsonian Institution, officials preparing a memoir in the 1870s distributed a three-page questionnaire seeking basic information "relating to the late James Smithson, F.R.S." and hired a London agent to collect material on Smithson's acquaintances and activities.[3]

Little that was useful came from these efforts, though the *Dictionary of National Biography* subsequently compiled what remains a fundamental, if necessarily speculative, biography from the accounts of George Brown Goode, William J. Rhees, Walter R. Johnson, and Samuel Pierpont Langley. The biography incorporated three elements common to explanations of the bequest: (1) homage to Smithson's scientific reputation as a natural philosopher and Royal Society fellow; (2) an allusion to Republican sympathies as a factor in his patronage of the United States; and (3) his preoccupation with immortality.[4] Yet the enigma remained.

My suggestion here is that perhaps the enigma may be solved by returning the bequest to the context of the developing English educational institutions which achieved great popular success during the 1820s. The belief in the improvement of man by the advancement of

[2]See Richard Rush to John Forsyth, May 12, 1838, "Smithsonian Bequest," *House of Representatives Report 227*, 27th Cong., 1st sess., March 5, 1840, p. 99; Cyrus Adler, "The Relation of Richard Rush to the Smithsonian Institution," *Smithsonian Institution Miscellaneous Collections* 52 (1910): 235–51.

[3]James Smithson Collection, Record Group 7000, Box 1, Smithsonian Institution Archives. An attempt to improve upon the information collected by Richard Rush in 1837–38, the questionnaire was sent from secretary Spencer F. Baird to William Wesley, a London book dealer identified as the agent of the institution. The questions sought information on Smithson's election to the Royal Society and his subsequent falling out with its leadership; on his student life at Oxford; and on the location of original correspondence between Smithson and his relatives, servants, and acquaintances. Wesley placed the questionnaire in *Nature, Annals and Magazine of Natural History, Philosophical Magazine*, and his own *Book Circular* and also distributed it among the membership of the Royal Society. The completed memoir, Rhees's "James Smithson and His Bequest," was severely criticized in the *Academy*, July 2, 1881, pp. 3–4. To the embarrassment of Smithsonian officials, the reviewer was able to determine the correct year of Smithson's birth (1765) simply by consulting his Oxford matriculation record.

[4]*Dictionary of National Biography Founded in 1822 by George Smith*, 18:579–80. In addition to Smithson's membership in the Royal Society, original research undertaken by J. C. Long for *James Smithson and the Smithsonian Story* revealed that Smithson had been a member of the Royal Institution.

knowledge among those least likely to have the opportunity to attain it gave birth to organizations like the London Mechanics' Institution (1823) and the Society for the Diffusion of Useful Knowledge (1825). Behind this organizational zeal lay a social consciousness which stressed mental cultivation and moral elevation and especially emphasized the boundlessness of scientific inquiry and diffusion as a means to these ends.[5]

By the late 1830s, however, strain had begun to develop between the objectives of "increase" and "diffusion," a strain perpetuated in America by the execution of Smithson's last contingency and exacerbated by the attempted reconciliation of the two terms with the professional aspirations of the American technical and scientific communities. Until well into the 1850s Americans debated the institutional intention of James Smithson. The bequest suggested to John Quincy Adams the construction of an astronomical observatory; to Rufus Choate, a great public library; to Robert Dale Owen, a normal school for training teachers; to Walter R. Johnson, an institution for experimental physics on the order of the Ecole Polytechnique; to Charles L. Fleischmann, a Germanic sort of school of agronomy and agricultural chemistry.

The schemes for the "increase and diffusion of Knowledge" advanced in America from the late 1830s through the 1850s better reveal the public interests of Americans during the period than explain the inspiration of an English natural philosopher who died in 1829. The same could be said of Joseph Henry's 1847 Smithsonian Programme of Organization. Henry's program interpreted Smithson's words to mean the increase of knowledge by original research and its diffusion via the press.[6] The reconciliation of the bequest with the aspirations of American professional science was no doubt the mark of Henry's genius. Yet that reconciliation depended

[5]"Institution" rather than "Institute" was the preferred organizational connotation in the early history of such organizations. See Chester New, *The Life of Henry Brougham to 1830* (Oxford, 1960), p. 333n. On social implications, see Steven Shapin and Barry Barnes, "Science, Nature and Control: Interpreting Mechanics' Institutes," *Social Studies of Science* 7 (1977): 31–74; Ian Inkster. "The Social Context of an Educational Movement: A Revisionist Approach to the English Mechanics' Institutes, 1820–1850," *Oxford Review of Education* 2 (1976): 277–307; Harold Smith, *The Society for the Diffusion of Useful Knowledge 1826–46: A Social and Bibliographical Evaluation*, Dalhousie University Library and Dalhousie University School of Library Service Occasional Paper no. 8 (Halifax, Nova Scotia, 1974); and R. K. Webb, *The British Working Class Reader 1790–1848: Literacy and Social Tension* (London, 1955), pp. 60–82.

[6]Henry's plan prefaced every annual report of the Smithsonian Institution during his administration from 1847 to 1878. An earlier and slightly different version found among the papers of John Quincy Adams has been reproduced in an appendix to Washburn (n. 1 above).

upon the characterization of Smithson as a prolific scientific researcher, a persona Henry continually employed to justify and defend his organizational program. My purpose here is not to disparage the legitimate aspirations of American professionals but to identify the popularly based and peculiarly English social assumptions suggested by Smithson's use of the phrase "increase and diffusion of Knowledge among men."

The adoption of natural and experimental science as cultural self-expression enjoyed tremendous popularity in the latter part of Smithson's life. For example, a writer in the *London Magazine* noted in 1828 that

> in every town, nay almost every village, there are learned persons running to and fro with electrical machines, galvanic troughs, retorts, crucibles and geologists' hammers; and if a crystal of feldspar, a prism of basalt, or a plate of mica happens to be found out of the place assigned to it by the fashionable system, we have a hundred heads settling and describing the anomaly. Nor lack we an abundant store of persons of both sexes, cunning in mosses and in shells, who can at a glance know the texture of the small cloths of every heath and hill. . . .[7]

In comparison, Smithson's biographer imparts a like incident recalled by one of Smithson's acquaintances:

> Mr. Smithson frequently repeated an occurence [*sic*] with much pleasure and exultation, as exceeding anything that could be brought into competition with it. . . . Mr. Smithson declared that happening to observe a tear gliding down a lady's cheeck, he endeavored to catch it on a crystal vessel; that one-half of the drop escaped, but having preserved the other half he submitted it to reagents, and detected what was then called microscopic salt, with muriate of soda, and, I think, three or four more saline substances, held in solution.[8]

The belief in the validity of popular observation and discovery neatly fitted the atomistic philosophy of society to which reformers subscribed. This atomistic philosophy held social progress to be directly proportional to individual improvement. Education, by enlarging an individual's capacity for observation and discovery, would enhance his human potential as well as improve the chance that discovery would contribute to an increase in knowledge. The motto, "Every man is a valuable member of society, who, by his observations, researches, and experiments, procures knowledge for men" (copied

[7]*London Magazine* 1 (April 1828): 130–38, cited in Inkster, pp. 287–88.
[8]Rhees, p. 12.

from a Smithson notebook), which appears merely as a rhetorical flourish on the title pages of the Smithsonian Institution's 19th-century publications, was actually accepted literally by Smithson's English contemporaries.

In fact, the most striking feature of Smithson's bequest is its endorsement of the phraseology of social atomism peculiar to institutional self-culture, that is, its allusion to the organized increase and diffusion of knowledge among men. For example, an article entitled "Hints for the General Diffusion of Science," which appeared in the (London) *Monthly Magazine* of 1814, explained in detail the benefits accruing to society from such "general diffusion." In this article and the series which followed, Thomas Dick contended that the dissemination of scientific truths through learned societies made accessible to the lower orders would not only promote "the moral improvement of mankind," but also "would be instrumental of enlarging the sphere of human knowledge, of diffusing through an extensive circle a great mass of rational information. . . ."[9]

Dick believed that the diffusion of truths to individuals who previously had been denied access to them would by itself constitute an increase in knowledge and that his plan would cultivate "a taste for intellectual pleasures" by the diffusion of knowledge "particularly among those in the inferior walks of life."[10] Yet more important for the meaning of the *increase* of knowledge—and I believe historians have overlooked this point—the diffusion of truths was expected to multiply the chances of discovery which would supply new knowledge. In this manner, the increase and diffusion of knowledge implied the advance not only of education but also of original discovery. Learned societies formed with this goal in mind would serve to "unite and concentrate the scattered rays of genius" emanating from the observations of "those in the inferior walks of life," particularly observations upon natural phenomena and processes of the useful arts. "As science is chiefly founded on facts, in proportion to the number of persons engaged in the observation of them, with a view to establish scientific principles," explained Dick, "in a similar proportion might we expect that the number of such facts would be encreased [*sic*], from which new and important conclusions might be deduced."[11]

Reformers during the 1820s continued to believe that the liberalized spread of educational opportunities would have a cumulative and reciprocal effect on the discovery of new scientific truth. The

[9]Thomas Dick, "Hints for the General Diffusion of Science," *Monthly Magazine* 39 (September 1, 1814): 122; series cied in Shapin and Barnes, p. 65n.

[10]*Monthly Magazine* 37 (April 1, 1814): 221.

[11]Ibid., pp. 220–21.

pamphlets and tracts of the mechanics' institution movement were laden with this sentiment, the logical product of a middle class thoroughly enamored with science as a cultural self-expression.[12] Reformers like Henry Brougham, the moderate Whig M.P. and Royal Society fellow, recommended the study of science to the working classes, and, to their betters, the endowment of mechanics' institutions and publication of inexpensive educational tracts. In *Practical Observations upon the Education of the People,* Brougham reasoned, ". . . if extending the bounds of science itself be the grand aim of all philosophers in all ages, they indirectly, but surely, accomplish this object, who enable thousands to speculate and experiment for one to whom the path of investigation is open."[13] Following this argument to its logical conclusion, Brougham claimed that the diffusion of knowledge among the working classes of artisans and operatives would increase discovery: "It is not necessary that all who are taught, or even any large proportion, would go beyond the rudiments; but whoever feels within himself a desire and an aptitude to proceed further, will press forward; and the chances of discovery, both in the arts and in science itself, will thus be infinitely multiplied."[14] Brougham pursued this reasoning in his next popular pamphlet, the first publication of the Society for the Diffusion of Useful Knowledge (1826), in which he restated his view of working-class "discoveries in philosophy" as one of the "practical advantages of learning."[15]

The reciprocal relationship of science and self-culture—commonly expressed as the increase and diffusion of knowledge—appealed to others who championed inexpensive and substantive working-class education. In August 1823, for example, John Robertson and Thomas Hodgskin began the influential publishing career of the London *Mechanic's Magazine.* (See fig. 1.) Published to encourage "the class of men to whom it is more particularly addressed to commit their thoughts and observations to writing," the *Mechanic's Magazine* contained patent descriptions and thumbnail biographies of great inventors. The editors also published analyses of the scientific journals

[12]Arnold Thackray, "Natural Knowledge in Cultural Context: The Manchester Model," *American Historical Review* 79 (June 1974): 672–709; John Fletcher Clews Harrison, "The Middle Class Image," in *Learning and Living 1790–1960: A Study in the History of the English Adult Education Movement* (Toronto, 1961), pp. 38–39; Inkster, passim.

[13]Henry Brougham, *Practical Observations upon the Education of the People Addressed to the Working Classes and Their Employers* (London, 1825), p. 10.

[14]Ibid.

[15]Brougham, *Objects, Advantages, and Pleasures of Science,* extracted from the preliminary treatise of the *Library of Useful Knowledge,* printed in *The Pamphleteer,* vol. 27, no. 54 (London, 1826); a different version appears as the introduction to "Natural Philosophy I," *Library of Useful Knowledge* (London, 1829), pp. 1–3; see also J. N. Hays, "Science and Brougham's Society," *Annals of Science* 20, no. 3 (September 1964): 227–41.

FIG. 1.—The frontispiece of the first volume of *Mechanic's Magazine* (1823–24), proclaiming "Knowledge Is Power" and rich in a style of imagery familiar to James Smithson.

of the day and "proposed to teach science to mechanics, and invited mechanics to lend their aid to men of science."[16] Elsewhere, other journals predicated success on similar reciprocal service. The *Franklin Journal,* published in Philadelphia by the Franklin Institute, frequently reprinted articles of interest to artisans from scientific journals, a practice adopted in acknowledged imitation of the London *Mechanic's Magazine*. While ascendant scientific and technical professionals subsequently challenged and won control of the *Franklin Journal*'s editorial direction, it is noteworthy that in its earliest guise it reprinted Smithson's "Method on Fixing Crayon Colours," a short utilitarian piece that the *Annals of Philosophy* had published in 1826.[17]

Smithson's description of his application of resins to the face and back of a crayon portrait was hardly the stuff of high science; yet Smithson clearly enjoyed access to the means of publishing such practical hints as well as more speculative work in the *Annals*. Of similar interest are three of Smithson's *Annals* contributions which Thomas Gill's *Technical Repository* reprinted from 1823 to 1826.[18] The purpose of the *Technical Repository,* like the initial series of the *Franklin Journal*, was to "convey to the Public *sound Practical Information* on the Useful Arts. . . ." The *Technical Repository* recommended itself not only "to the members of our Philosophical Societies, whose minds are constantly engaged in the various paths of Technical Science," but to the village reading room as well, "wherein the Merchant, the Medical Professor or Chemist, the Farmer or Horticulturist, the Mechanician, Artist, or Handicraftsman, may find instruction in the study of Technical subjects." Improvement in such subjects would not only suit their tasks at

[16]*Mechanic's Magazine* (London; 1st ed., August 30, 1823). Quotation from the preface to vol. 3 (1825). For an example of journal analyses, see no. 20 (January 10, 1824), p. 306; for the call to organization attributed to editors John Robertson and Thomas Hodgskin, see "Institutions for Instruction of Mechanics," October 11, 1823, pp. 99–102. The call resulted in the successful organization of the London Mechanics' Institution. The subsequent plan of the institution proposed a library of reference, a museum, lectures on natural and experimental philosophy, and an experimental workshop and laboratory.

[17]*Franklin Journal and American Mechanics' Magazine* 1 (May 1826): 304. On the *Franklin Journal* and the Franklin Institute's professional interests, see Bruce Sinclair, *Philadelphia's Philosopher Mechanics: A History of the Franklin Institute 1824–1865* (Baltimore, 1974), pp. 195–216.

[18]James Smithson, "On the Discovery of Acids in Mineral Substances . . . " (dated April 12, 1823), *Technical Repository; Containing Practical Information on Subjects Connected with Discoveries and Improvements in the Useful Arts* 3 (1823): 382–86; "On an Improved Method of Fixing Small Particles of Minerals, etc. . . ." (dated October 24, 1823), *Technical Repository* 5 (1824): 3–7; "On a Very Sensible Balance, for Weighing Small Globules of Metals. By the late Dr. Black" with a "Note by Mr. Smithson" (dated May 12, 1825), *Technical Repository* 8 (1826): 76–78.

hand but "beget new ideas, and induce them to examine how far any new inventions may be applied to that branch which each exercises," explained Gill, "for all Arts reciprocally tend to one common perfection."[19]

The justification for assembling in digest form the work of science pertinent to technical processes suggests that the topical association of art and science was nothing if not the product of a social projection conceived in terms of reciprocal relationships and common perfection. As Gill observed, "We live indeed in an age when, with some exceptions, Potentates and Princes bestow personal attention on the Mechanical Arts; and a patent of Nobility is not thought to be dishonoured by its possessor joining with Artisans in executing some plan of mechanical improvement. . . ."[20] The inauguration of the lecture theater of the London Mechanics' Institution in July 1825 provides an example of one of the more public demonstrations of this relationship. The king's brother, the duke of Sussex, performed the opening ceremony, supported by the marquis of Lansdowne and other luminaries. Warming to the task of dedicating the foundation of the theater in December 1823, President George Birkbeck characteristically had described the facility as "an edifice for the diffusion and advancement of knowledge."[21] What was by then becoming a pattern of generous endowment had made the construction possible; among the theater's prominent patrons, M.P. Sir Francis Burdett, for example, had subscribed £1,000, followed by contributions of £100 each from Jeremy Bentham and M.P. John Cam Hobhouse.[22]

It is possible that Smithson was never exposed to the philosophies of the journals which reprinted his articles or to the London celebrations of philanthropy which marked the zenith of the self-culture movement in 1825. But the little remaining evidence argues he was. Smithson's will places him in London on October 24, 1826; thus the case for his acquaintance with the contemporary celebration of self-culture becomes more plausible with the certain knowledge of his presence in London the previous year. Postscripts to two articles, including "Crayon Colours," reveal Smithson to have been there during May and August of 1825.[23]

The first tracts of the Society for the Diffusion of Useful Knowl-

[19]*Technical Repository*, vol. 1 (1822).

[20]Ibid.

[21]*London Mechanics' Register* 1(1825): 85–86, cited in Thomas Kelly, *George Birkbeck: Pioneer of Adult Education* (Liverpool, 1957), p. 96.

[22]Kelly, pp. 93–94, 97.

[23]William J. Rhees, ed., *The Scientific Writings of James Smithson* (Washington, D.C., 1879).

edge (1826) and the success of the *Mechanic's Magazine* and of Brougham's *Practical Observations* (which ran to twenty editions on its publication in 1825) all attest to the popular adoption of science as a cultural expression during Smithson's life. If popular strength means anything at all, the tantalizing proximity of Smithson to the flowering of self-culture increases when the magnitude of organization during these years is considered. Mechanics' institutions, the most prevalent of self-culture's organizational models, steadily grew in number during the early 1820s, with seventy formed in 1825 alone.[24]

This is not to argue that Smithson intended to found a mechanics' institution. As expressions of liberal reform, these institutions evoke the temper of the time in which Smithson worked and suggest a pattern of enlightened and publicly acknowledged philanthropy. But, more important, the social rationale of reciprocal relationships implicit in these organizational patterns seems a better explanation of Smithson's inspiration than the professional interests advanced in his name by the American scientists who claimed and executed his bequest. Whereas the English reformers of Smithson's day championed the extensive diffusion of science as the most comprehensive means to its increase, American scientists struggling to establish their profession "sought carefully to delimit role and status so that specializations were more clearly defined and science might advance more rapidly."[25] The revelation of Smithson's bequest and the ensuing debate over what constituted the "increase and diffusion of Knowledge among men" occurred during the emergent period of professional science in America.[26] The prevalent conception of "increase and diffusion" as specialized functions dates from this period.

[24]Kelly, p. 209; see also Smith, Webb (n. 5 above), pp. 67–73; and *Society for the Diffusion of Useful Knowledge* (London, 1825).

[25]Sally Gregory Kohlstedt, *The Formation of the American Scientific Community: The American Association for the Advancement of Science 1848–60* (Chicago, 1976), p. 18. Kohlstedt emphasizes American amateur activity as the stimulus of counteracting professional reaction and development which contributed to the demise of self-culture.

[26]George H. Daniels, "The Process of Professionalization in American Science: The Emergent Period, 1820–1860," *Isis* 58 (Summer 1967): 151–66.