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never before had a personal interview with Mr Young although I have heard him very favourably spoken of and the impression he made on me in this interview served to confirm my previous opinion. I can however say nothing of his peculiar fitness for the office of Secretary of the new Board.

Give my kind regards to Mrs Bache and many thanks for her attention to me while in the "wilderness." I hope she will think none the worse of me because I happened to be seized with an attack of home-sickness even when I was in the midst of my best friends. The truth is that as I grow older I find the presence of my wife and children more and more necessary to my comfort. This at least will be allowed to be an amiable weakness and will not be too severely censured by my kind friend Mrs. B.

As ever yours
Joseph Henry

TO ALEXANDER DALLAS BACHE

*Bache Papers, Smithsonian Archives*¹

Princeton Sept [5]th² 1846

My Dear Bache,

I have given the Smithsonian bill some thought within the last two days, and send you the following suggestions which have occurred to me without much reflection, and which I therefore do not offer with much confidence. I should require longer time and more study of the subject, before venturing to propose definitely a general plan for the institution. The remarks I offer may however be of some little importance to you in confirming your opinion of the value of some of the thoughts which have arisen in your own mind and may correspond with any here offered.³

¹ In the hand of an unknown amanuensis, with Henry providing corrections, author's footnotes, and everything beginning with the last paragraph of the body of the letter. Because of the method of composition, we have retained all of Henry's corrections.

Drafts in Henry's hand, with minor variations of text, exist for the paragraphs numbered 2 through 4. They are in Box 30, Folder "Smithsonian Institution Miscellaneous Notes and Papers," Henry Papers, Smithsonian Archives.

² Though the manuscript is dated the sixth, in his letter of the seventh to Bache (immediately below) Henry claimed that he wrote this on Saturday, which was September 5.

³ One indication of Bache's views on the disposition of the Smithsonian fund may be found in the address he delivered in April 1844 at the Washington meeting of the National Institute for the Promotion of Science. On many points Bache clearly agreed with Henry. He called for increased support and encouragement for scientific research, especially in American colleges (p. 76). Bache decried the lack of good scientific periodicals and called for a new journal to provide concise summaries and translations of the best of European science, "prepared for assimilation" (p. 82). Both these points, as will be seen below, were part of Henry's program. However, Bache also showed that he was favorably in-

The object of the institution is the *increase* and *diffusion* of knowledge. The increase of knowledge is much more difficult and in reference to the bearing of this institution on the character of our country and the welfare of mankind much more important than the diffusion of knowledge. There are at this time thousands of institutions actively engaged in the diffusion of knowledge in our country, but not a single one which gives direct support to *<the>* its increase *<of knowledge>*. Knowledge such as that contemplated by the testator can only be increased by original research, which requires patient thought and laborious and often expensive experiments.⁴

clined towards closer links between science and government, a position with which Henry could not agree.

Box 5, Folder "The Wants of Science in the United States," Bache Papers, Smithsonian Archives. See also Henry to Bache, April 16, 1844, note 10, above.

⁴This is the first of Henry's many statements that the Smithsonian bequest ought to be applied predominantly to support scientific research. As Wilcomb Washburn has shown, this theme would be constant in Henry's justification of his program. For example, as late as January 12, 1877, in the last full year of his Secretaryship, Henry wrote that "the Institution is . . . the establishment of an individual for scientific purposes" (Henry to J. P. Lesley, Henry Papers, Smithsonian Archives). Yet as Nathan Reingold has pointed out, Henry's rhetoric should not blind us to his pragmatic accommodations. As Henry himself said, "we cannot expect in all instances to carry our points and must be content in doing what we can instead of what we would" (Henry to A. D. Bache, August 15, 1864, Bache Papers, Smithsonian Archives).

Henry's distinction between the discovery of new truths and the propagation of established ones is markedly French. Research and education in France were widely separated, even into the twentieth century. Yet in 1846, such a distinction was relatively new to Anglo-American culture, whose institutions consistently blended discovery and diffusion. The British "decline of science" debate in the early 1830s called attention to the contrast, however, as it unfavorably compared that nation's research efforts to those on the Continent. William Swainson's *Preliminary Discourse on the Study of Natural History* (London, 1834) raised these issues directly and used the words *increase* and *diffusion* to do so (in passages which Henry marked in his copy and referenced on its back cover: pp. 314 and 343). The institutional offshoot of the debate, the British

Association for the Advancement of Science, did in fact sponsor a program of research which Henry strongly endorsed and partly adopted. (See below, Henry to Gideon Hawley, December 28, 1846.) But as an *institution*, the British Association remained extremely broad-based, its support resting on its huge annual meetings, with their public lectures and addresses and their lively sessions, widely reported in the press. Certainly in the United States in 1846, there was no institution whose major and avowed purpose was research. Henry's call was for a new kind of scientific establishment.

What follows is the first of Henry's attempts to define a program for the Smithsonian. His concept underwent a major shift after his election and subsequent encounter with the Board of Regents. In his late December 1846 letters to Gideon Hawley and James Coffin (both below), he put forth substantially revised ideas, of which his plans for review journals and reports (elaborated below and in his following letter to Bache of September 7) form the major common points.

Wilcomb E. Washburn, "Joseph Henry's Conception of the Purpose of the Smithsonian Institution," in *A Cabinet of Curiosities: Five Episodes in the Evolution of American Museums*, ed. Walter M. Whitehill (Charlottesville, Virginia, 1967), pp. 106-166. Nathan Reingold, "The New York State Roots of Joseph Henry's National Career," *New York History*, 1973, 54:133-144. Robert Fox, "Scientific Enterprise and the Patronage of Research in France 1800-70," *Minerva*, 1973, 11: 442-473, especially p. 464. Robert Gilpin, *France in the Age of the Scientific State* (Princeton, 1968), especially pp. 98-99. Jack Morrell and Arnold Thackray, *Gentlemen of Science: Early Years of the British Association for the Advancement of Science* (New York, 1981). D. S. L. Cardwell, *The Organisation of Science in England*, rev. ed. (London, 1972), pp. 59-62. *Henry Papers*, 1:342n-343n.

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There is no civilized country in the world in which less encouragement is given than in our own to original investigation, and consequently no country of the same means has done and is doing so little in this line.⁵ A person who has distinguished himself in England by original discoveries is certain of *<the>* a reward—he is either preferred to some office under government, or to a living in the church if he has taken orders; or a fellowship in the University, or his name is placed on the pension list; or if he be very much distinguished he receives the honor of Knighthood,⁶ and in all cases he has the result of his labor secured to him by an international copyright, which prevents the free publication of foreign works.⁷ In France the person who devotes himself to science and succeeds in establishing a character for originality is elected a member of the national institute; *<and>* receives from the government a salary during his life⁸ and is elected, if thought worthy a

⁵ For discussions of scientists' perceptions that their activities were not supported in the United States, see Nathan Reingold, "The Scientist as Troubled American," *American Industrial Hygiene Association Journal*, 1979, 40:1107–1113, and idem, "American Indifference to Basic Research: A Reappraisal," in *Nineteenth-Century American Science: A Reappraisal*, ed. George Daniels (Evanston, Illinois, 1972), pp. 38–62.

⁶ Here and in his comments below on France, Henry held out for two goals, recognition and reward, that he thought generally lacking on the American scene. Britain and France, as more mature countries, with institutional structures for science going back to the seventeenth century, managed to provide a modicum of both to their practitioners.

To the country's best scientists, Britain held out posts generally lacking in the United States. They could secure fellowships or professorships at the ancient universities of Cambridge or Oxford, at the Scottish or Irish universities, or at the newer university and colleges in London. High government positions existed at the Royal Observatories, the Botanic Gardens at Kew, or in the Geological Survey. (Only Bache, and perhaps R. M. Patterson as Director of the Mint, held roughly comparable positions in the United States.) The number of knighthoods awarded for science—a point of contention in the "decline of science" debates—had increased in recent years. From 1830 to 1846, no fewer than seven of Henry's British contemporaries had received the honor (Brewster, De La Beche, Hamilton, Herschel, Hooker, Murchison, and South). Church livings had long been available to the academically gifted, but were less and less used to re-

ward scientists.

Nonetheless British scientists were discontent with the structure of science. David Brewster continued to call for an institution like the French National Institute; nothing else, he thought, was capable "of developing, and directing, and rewarding, the indigenous talent of the country." The Crystal Palace Exhibition of 1851 was taken more as a spur for reform in science than an expression of achievement. As late as 1855, the British Association still regretted the few inducements for young men to study science professionally. Though Henry saw an embarrassment of riches in Britain, his experiences—in person in 1837 and indirectly thereafter—had been with the successes of the system. Though the rewards were greater, so was the pool of interested and qualified people. Much as did Americans, British scientists had a difficult time making their professional way and sustaining their research.

David Brewster, "Presidential Address," *British Association Report*, 1850 (1851), pp. xxxi–xliv, quote from p. xlii. "Report of the Parliamentary Committee of the British Association," *British Association Report*, 1855 (1856), pp. lxi–lxii. Cardwell, *Organisation of Science*, pp. 70–110.

⁷ Lack of recognition of international copyright by the United States was a recurring theme in Henry's correspondence. See, for example, *Henry Papers*, 5:244, 256, and 265, and his letter to Charles Wheatstone, February 27, 1846, above.

⁸ For Henry's attitudes toward the Institut de France and a brief sketch of its history, see *Henry Papers*, 3:374–376.

As with Great Britain, Henry had an overly

member of the Legion of Honor. These are powerful inducements to exertion in the way of original investigation entirely unknown in our country and some of them incompatible with the genius of our institutions. Indeed original <discovery> discoveries <is> are far less esteemed among us than <the application of these discoveries> their applications to practical purposes, although it must be apparent on the slightest reflection that the discovery of a new truth is much more difficult and important than any one of its applications taken singly. Notwithstanding the little encouragement given to original investigation among us, it is true something has been done but this is chiefly not in the line of science properly so called which is a knowledge of the laws of phenomena, but in that of descriptive natural history.

But how can the Smithsonian institution encourage original research? In answer to this enquiry I would offer the following as the general outline of a plan not fully matured. 1st—Select from the scientific men of the country a few in the different branches who have already distinguished themselves by original discovery, and furnish these with all the means of prosecuting their researches.* The number should be very small at first and gradually increased as the number of worthy candidates offered, until a limit be attained depending on the income of the institution. <These>

* The collection of meteorological and other <obs> observations and of statistical information would be included in the increase of knowledge.

rosy appreciation for the life of science in France. Though in the seventeenth and eighteenth centuries the Academy of Sciences (the Institut's predecessor) had been a viable and active organization, by the nineteenth century it was an "obsolete institution" (Hahn, *Anatomy*, p. 318). Throughout, its remuneration had been inadequate for the needs of scientists. In the nineteenth century, regular members were paid Fr 1,500 and permanent secretaries Fr 6,000. This corresponded to about \$280 and \$1,125 respectively, hardly sufficient as a comfortable middle-class income in Paris, estimated at Fr 15,000. In fact, though election to the Institut remained a high honor, for their livelihood academicians relied on the *cumul*—the accumulation of teaching, government, and industrial jobs, comprising consulting, examining, and general administration. The research that earned membership was conducted under quite difficult and penurious conditions. Membership did not secure wealth; instead, it opened doors to other employment and to careers in other fields, notably politics. The Institut did not noticeably promote re-

search, which in France depended mostly on the initiative of the individual scientist. Further, while Henry saw this honorific membership as an inducement to exertion, most historians of nineteenth-century French scientific institutions instead have seen an overall rigidity caused by a centralized system. They regard the *grandes écoles*, rather than the Institut, as important in shaping the careers of French scientists.

Roger Hahn, *The Anatomy of a Scientific Institution: The Paris Academy of Sciences, 1666-1803* (Berkeley, 1971). Idem, "Scientific Careers in Eighteenth-Century France," in *The Emergence of Science in Western Europe*, ed. Maurice Crosland (New York, 1976), pp. 127-138. Fox, "Scientific Enterprise in France." David Brewster, "[Review of] *Reflexions on the Decline of Science in England and on Some of Its Causes*," *Quarterly Review*, 1830, 43:305-342. Maurice Crosland, "The Development of a Professional Career in Science in France," in *Emergence of Science*, pp. 139-160. *Henry Papers*, 3:393n.

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The situations thus established should be held out as honorable objects of ambition for the scientific aspirants, and in all cases the ground of choice should be the scientific value of the discoveries of the candidate, and in most cases the selection on this ground would not be difficult. The selection <of these> should be determined by the ballot of a number of proper judges.

<These> The persons elected as a condition of retaining their office should be required annually or at stated periods to communicate to the institution an original memoir, and they should also be required to devote a portion of their time to the diffusion of knowledge in the way of publications.

In furtherance of the same object the institution should be amply furnished with all the implements of research and provision made for the increase of such of these as the progress of science would render necessary.⁹

Instead of the plan I have given above one more nearly in accordance with that of the French institute might perhaps be considered more practical.¹⁰

It should be recollected that Mr Smithson devoted his life principally to scientific pursuits, and that he himself increased the sum of human knowledge by a number of valuable scientific communications. It is therefore to be presumed that he intended by the expression "for the increase of knowledge" an organization which should promote original scientific researches in a way similar to the one we have proposed. Diffusion was however also

⁹ Henry's proposal for a corps of researchers was unique, in two senses. This part of the plan did not appear in his later ideas, nor in his formal Programme. And no other conception (save perhaps John Quincy Adams's proposed national astronomical observatory), existing American institution, or institution in the near future, would secure for a group of scientists a regular salary and liberal research budget and facilities. The 1873 proposal for a University of Discoverers at Princeton—which Henry supported—and the founding of Johns Hopkins University in 1876 marked the resurgence of this ideal, albeit in a university setting. The Carnegie Institution of Washington, established in 1901, provides perhaps the closest analogue to the research institute that Henry envisioned.

Here as elsewhere in Henry's conception, the original impetus was French. But again, Henry alluded to the image and not the reality. The Institut National de France provided for a self-perpetuating elective body of men of merit in all branches of the sciences (though elections had to be confirmed by the government as the academicians were govern-

ment pensioners). But members of the Institut did not receive an adequate stipend (as noted above), did not have their means of research supplied, and were required to provide the government with scientific and technical advice. A utopian image of the Institut was powerful and prevalent outside France, however. In 1830 David Brewster had this view: "the members of the academy may be considered as placed in opulent circumstances, and being freed from all the anxieties of professional labour, are enabled to pursue their scientific inquiries in the calm of seclusion and domestic life." (*"Decline,"* p. 317.) Twenty years later, urging the creation of a British National Institute, he characterized its model as "a class of resident members enabled to devote themselves wholly to science." (*British Association Report, 1850* [1851], p. xliii.)

¹⁰ Henry's reference is unclear. However, as we have interpreted Henry's program, it departed from Institut practice on two major points. French Academicians themselves selected members to fill their ranks, and they received a stipend but no research budget per se.

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a part of his general plan and therefore the question is how can this be best effected in accordance with the other object?

It certainly was not the *<object>* intension of the testator merely to diffuse knowledge among the inhabitants of Washington, and the comparatively few persons who visit that city, but as widely as possible among mankind in general, and particularly it may be supposed among the inhabitants of the United States.

1st. Can this object be best effected by the formation at the seat of government of a large library? Congress has already made provision for an object of this kind, the effects of which must in a great measure be local; but few cases can occur in which a person will travel from a distance to consult a book in Washington, and when such a case does occur the book ought to be found in the library of Congress.

A working library however is necessary for carrying out the plan we have proposed for increasing knowledge and hence a small part of the income of the institution should be annually expended in purchasing suitable books.

2nd. Will the diffusion of knowledge be much promoted by a large expenditure of the income of the institution in the purchase of curiosities, minerals and other objects for the illustration of natural history? We think not; the influence of such a collection must also be local. The purchase should in the first place be limited to such objects as are more immediately important in the prosecution of any new branch of natural history, such as full sets of microscopic preparations for the use of those engaged in researches of this kind. A museum however may be gradually formed by a small annual appropriation for the purchase of new articles and the preservation of such specimens as may be presented.

3rd. The delivery of lectures. The effect of this plan would also be local and only furnish the same information which is provided in every part of the country by the public institutions now in operation. In order however to keep up a popular interest in the institution, a short annual course of lectures might be given by each working member to the members of Congress and other persons who might choose to attend. Some of these lectures might be of a more profound character and intended for the instruction of persons who have received a knowledge of the elements of science at some other institution.

<4th> 4 The plan we think most important in the way of diffusing a knowledge of true science throughout our country is that of the periodical *<publications>* publication of a series of journals at prices so low that they would be within the reach of almost every person and conducted by a principal editor assisted by collaborators in the different branches. The number

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of these journals *<would>* should only be limited by the income of the institution and should be devoted to the several branches of knowledge properly classified. The first numbers of each journal should be occupied with a sketch of the present state of the science to which it is to be devoted, posting up in a general way the latest discoveries and digesting the whole into a system. After the completion of this each succeeding number should give an account of all the discoveries made during the interval of publication throughout the whole world, proper care being taken to insert nothing incompatible with the principles of true science; also the public should be informed through *<these>* the journals of the value of any improvement in the arts and warned against the impositions of quackery. The same journals should also record the proceedings and operations of the institution and give place to all the valuable contributions made to science in this country—thus giving due prominence to the labors of Americans and endeavoring to promote the increase as well as the diffusion of *<true science>* knowledge. I would not confine these journals to the Physical sciences but besides these they should embrace moral and political science and the fine arts* and be as extensive and numerous as the income of the institution would warrant. A more valuable series of journals might thus be produced than any ever before published; not being entirely dependant on subscription for support liberty would be given to the collaborators to reject any improper article and to comment freely on the pretensions of the charlatan. Conducted by the most celebrated men in our country in the several branches of which they treat they would soon establish a character which would add much to the reputation of our country abroad and serve to direct public opinion at home.

By a plan of this kind properly carried out the institute would be constantly before the public and the name of Smithson become familiar to every part of the world. I really hope that but a very small part of the present interest will be expended in putting up a building; it is to be regretted that the institution cannot be accomodated with some rooms of the present public buildings. It should be remembered that the name of Smithson is not to be transmitted to posterity by a monument of brick and mortar, but by the effects of his institution on his fellow men.

Please give my kind regards to my friend Dr. Hawley and say to him for me that I should be much pleased to receive a visit from him for a few days at Princeton on his return. I went down to the Depot last night with some

* Among the number a popular journal should be devoted to agriculture and domestic economy.

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expectation of seeing you but was disappointed. Mr Walker¹¹ called this afternoon and left your message. I shall expect to meet you on your return to the East. My duties in college will not permit me to leave college again until next Thursday. I think it would be well for us to have another meeting before the final settlement of the cooking affair.¹²

In haste—I remain yours as ever
Joseph Henry

P.S. Should the foregoing communication be placed before the board of trustees look it over first and make all necessary corrections and alterations it has been prepared this afternoon in great haste. It is written for yourself but I have no objections to having it brought forward if so doing will serve any good purpose.¹³ J. H.

¹¹ Perhaps W. S. Walker, a Coast Survey employee. Walker to Bache, November 25, [1846], Letter Books 1846, Vol. 2, "Civil Assistants," General Correspondence of Alexander Dallas Bache, Records of the Coast and Geodetic Survey, RG 23, National Archives.

¹² See above, Bache to Henry, June 30, 1846.

¹³ Henry later recollected that this letter led to his nomination as Secretary of the Smithsonian Institution. Before Bache sent him a copy of the act, he had not in fact paid much attention to the matter and had not realized the responsibilities devolving on the Secretary,

who he thought would be "merely a clerk." Perusal of the act clearly changed his mind about the scope of the Institution and the position. Nonetheless, he "had not the least idea" of becoming Secretary. After the first Regents' meetings of September 7 through 9, Bache told Henry that his name had been favorably brought up before the Board as "the most prominent candidate." Undated reminiscence, Folder "Smithsonian Institution Miscellaneous Notes and Papers," Box 30, Henry Papers, Smithsonian Archives.

TO ALEXANDER DALLAS BACHE

*Bache Papers, Smithsonian Archives*¹

Princeton
Sept 7th 1846

My Dear Bache

I could not leave home on Saturday last but if you will inform me when you intend to return I will meet you if possible either in Phil^d or at the Princeton Depot. The college lectures are so arranged for this session that I cannot leave home on the first three days of the week.

The suggestions I sent you on Saturday² in reference to the Smithsonian institution were I fear too crude to be of much use to you—my mind requires

¹ The letter shows signs of Mary Henry's treatment.

² See directly above.