through conversion to a market economy, will confer benefits on scientific work both in Russia and the West. Better relations between Russia and Western scientists will also be to the advantage of scientists throughout the Commonwealth of Independent States.

Western governments should use great circumspection in determining which areas of scientific activity merit their support. As was demonstrated by the recent stranding of a Russian astronaut in space, the United States might be saddled with huge costs for co-operation in space with Russia, despite Russia's unquestionably talented manpower and powerful rockets. Clearly, there are better projects for both countries to support.

A clearing-house of information on public and private ventures, perhaps within the United States National Science Foundation or National Academy of Sciences, should be maintained to ensure a systematic approach to the internationalisation of Russian science. This will assist universities, private foundations and professional associations, wishing to establish contacts with the Russian scientific community to use their limited resources more efficiently. Russia, for its part should focus more resources on its problems of health care and environment, as well as on "small science".

Western governments and professional societies should encourage, to the extent that they can, the shift of authority from higher governmental bodies to the institutes and scientific societies; they could perhaps do this by establishing direct contact with these organisations. This might help ensure that Russian risk and technology assessment processes learn from Western practices and become more sensitive to global issues. Russian scientists in the fields of environmental science, science and technology policy and public health have most to gain. The progress of the internationality, decentralisation and democratisation of scientific activities in Russia could possibly lead to a more rational balance between social and scientific interests and potentials. It would challenge the past assumptions of the scientific and political elite that science and technology, everywhere and always, are capable of solving all the problems of economic and social development. Russia and the Western countries would be better off with more modest aspirations regarding the powers of scientific knowledge and technological inventiveness.

Congressmen and Scientists in the Making of Science Policy: The Allison Commission, 1884–1886

DAVID H. GUSTON

THE HISTORY OF SCIENCE and the history of government in the United States have been intertwined since the founding of the Republic.[1] Professor Hunter Dupree once suggested that the silence of the Constitution on scientific matters made American science policy "hesitant" from its early days to the present.[2] Constitutional silence, in science policy as in other areas of policy, has provided the opportunity for enterprising advocates of science to seek to define the necessary and proper domain of the federal government. John Quincy Adams was one such advocate, but he was less successful in his own advocacy than in its legacy.[3] John Wesley Powell was another, developing in the late nineteenth century a novel claim for the public patronage of science based on the intellectual legitimacy of the body of collective scientific opinion.[4] Vannevar Bush epitomised the innovator of science policy, setting out the framework for the new relationships of American science and technology after the Second World War.[5]

In addition to creating opportunities for advocates of science to promote the growth of federal activity in research, constitutional silence provided similar opportunities for the control of science by enterprising politicians. That is how the instruments of accountability and control of federal science were invented: politicians, particularly members of Congress, accepted the federal support of science as necessary, but at every turn they needed to ensure that its conduct was proper. The story of accountability and control—the story of ensuring proper conduct—is one of individuals pursuing their own goals, but subject to constraints. Members of Congress dealt with the demands of scientists not merely on

[1] Dupree, A. Hunter, *Science in the Federal Government: A History of Policies and Activities to 1940* (New York: Harper and Row, 1957).

[2] *Ibid.*; and Dupree, A. Hunter, "Science Policy in the United States: The Legacy of John Quincy Adams", *Minerva*, XXVIII (Autumn 1990), pp. 259–271.

[3] Dupree, A.H., "Science Policy", *op. cit.*

[4] Turner, Stephen P., "The Survey in Nineteenth-Century American Geology: The Evolution of a Form of Patronage", *Minerva*, XXV (Autumn 1987), pp. 282-330.

[5] Dupree, A.H., "Science Policy", *op. cit., p. 266; and Wise, G., "Science and Technology", in Kohlstedt, S.G. and Rossiter, M.W. (eds), Historical Perspectives on American Science: Perspectives and Prospects* (Baltimore: Johns Hopkins University Press, 1986), pp. 242–244.

the merits of the latters' claims, but primarily out of consideration for their own congressional situation.

The opponents of the scientists are often vilified. But to understand the development of American science policy completely, we should understand what the "opponents" of innovative science policy believed themselves to be doing, and what mechanisms they developed to assert their control of science policy as it moved through their domains.

The Allison Commission was an *ad hoc* joint committee of the United States Congress established by a provision of the Sundry Civil Bill of 7 July, 1884, to examine the organisation of the scientific bureaux of the federal government. The Allison Commission—named after its chairman, Senator William Boyd Allison of Iowa—was formally called the Joint Commission to Consider the Present Organizations of the Signal Service, Geological Survey, Coast and Geodetic Survey and the Hydrographic Office of the Navy Department. The Signal Service of the Army included the Weather Bureau, and it maintained a school of meteorological training at Fort Myer, Virginia, under the direction of Brigadier-General William B. Hazen. The Geological Survey of the Department of the Interior—under the direction of Major John Wesley Powell—mapped public lands and conducted research into geology, ethnology, archaeology and palaeontology.[6] The Coast and Geodetic Survey, formed in 1807, charted coastal waters and lands and conducted a transcontinental triangulation under Superintendent J.E. Hilgard. The Hydrographic Office also performed coastal mapping, but its domain was restricted to foreign coasts.[7] These bureaux spent most of the federal budget for scientific research. Together, they accounted for about $3 million in annual appropriations in the years before the billion dollar budget.

Failure to look upon the Allison Commission as a congressional phenomenon has led to misunderstanding of its role and influence.[8] Rather than being interested in scientists' concerns about the proper organisation of governmental science, the members of the Allison Commission were interested in controlling the scientific bureaux. The commission scrutinised the conduct of these bureaux and changed existing law with respect to them. But to characterise the commission, or individual members such as Hilary Herbert, as "anti-scientific", is a distortion that

[6] Turner, S.P., "The Survey", *op. cit.*; see also Manning, Thomas G., *Government in Science: The U.S. Geological Survey, 1867–1894* (Lexington: University of Kentucky Press, 1967).

[7] Manning, Thomas G., *U.S. Coast Survey vs. Naval Hydrographic Office: A 19th Century Rivalry in Science and Politics* (Tuscaloosa: University of Alabama Press, 1988).

[8] See Dupree, A.H., *Science, op. cit.*, ch. XI; True, Frederick W., *A History of the First Half-Century of the National Academy of Sciences, 1863–1913* (Washington, DC: National Academy Press, 1913); Manning, T.G., *Government in Science, op. cit.*; Cochrane, Rexmond C., *The National Academy of Sciences: The First Hundred Years, 1863–1963* (Washington, DC: National Academy Press, 1978); Kevles, Daniel J., *The Physicists: The History of a Scientific Community in Modern America* (New York: Knopf, 1978); and Manning, T.G., *Coast Survey, op. cit.*

obscures the achievements of politicians in asserting the principles of accountability for the funds appropriated for scientific work by the federal government. The Allison Commission needs to be placed in its proper congressional context. To do so allows a reinterpretation of its role in establishing rationales and mechanisms to hold governmental science accountable, that is, to ensure its proper conduct.

Congress and Committees

The Congress of the 1880s was in transition from the informal, non-professional "spider web" of relations in the Gilded Age to a more formal system ushered in with Progressivism.[9] In both the Gilded Age and after it, the committees of Congress performed most of the legislative work.[10]

Committees are designed and used to serve the interests of members of Congress. By dividing members into specialised groups like commerce, agriculture or military affairs, committees help them to develop expertise and use it to pursue their other goals. This division of labour also helps Congress manage its workload. Committees provide each member with resources to accomplish the goals of re-election, service to constituents, prestige in the chamber, and influence on policy; members of one committee vie with members of others to increase the power or jurisdiction of their respective committees.[11] The outcome of these conflicts, together with the subjects of jurisdiction of the committees and the personal characteristics of members, render some committees more powerful than others, and thus more helpful to members in pursuing their goals.

The committee system, dividing the congressional membership, and the jurisdictional system, assigning different subjects and specific bureaux to these committees, are two aspects of congressional structure. To attain their desired legislative ends, members of Congress take advantage of opportunities provided by these structures: rules and jurisdictions are as crucial as the preferences of members in determining the fate of proposed legislation.[12] The Allison Commission was an *ad hoc* change in the structure of Congress with respect to jurisdiction over the scientific bureaux, and as such is an interesting focus for studying the congressional government of science.

The commission set a precedent for later congressional responses to innovations in science policy. To a great extent, the form of the Allison

[9] Thompson, Margaret Susan, *The "Spider Web": Congress and Lobbying in the Age of Grant* (Ithaca: Cornell University Press, 1985), p. 19.

[10] Wilson, Woodrow, *Congressional Government: A Study in American Politics* (Boston: Houghton Mifflin Company, 1885).

[11] Fenno, Richard, *Congressmen on Committees* (Boston: Little, Brown, 1973).

[12] Krehbiel, Keith, "Sophisticated Committees and Structure-induced Equilibria in Congress", in McCubbins, M.D. and Sullivan, T. (eds), *Congress: Structure and Policy* (Cambridge: Cambridge University Press, 1987), pp. 376-402.

Commission's inquiry and its concerns laid down an enduring pattern for the subsequent congressional control of science: the Joint Committee on Atomic Energy, the inquiries of the Government Operations Committee under Representative Fountain into the grant-making practices of the National Institutes of Health, the House Science Policy Task Force, and the investigations of the Energy and Commerce Committee led by Representative Dingell into scientific misconduct and the billing of indirect costs, are among examples of the continuing influence of the Allison Commission.[13]

Studying the motives for this structural change and the preferences that affected it sheds light on the role of the Allison Commission in the history of science policy in the United States. The commission viewed the scientific bureaux as objects to be manipulated to serve the narrow interest of protecting the power of congressional committees. Members of Congress, responding to the new demands of scientists such as Powell, attempted to invent new mechanisms of control in order to inform themselves about the activities of scientists and to hold them accountable.

Appropriations and the "Devolution of 1885"

The Allison Commission must be seen in the context of other structural changes in Congress. The most important function of Congress—deciding how much money to appropriate to executive bureaux—was particularly ill-defined in the nineteenth century.[14] In the last quarter of that century, members of Congress attacked the power of the appropriations committees, which had until then retained sole authority to appropriate federal funds. In 1880, the Rules Committee of the House of Representatives transferred authority over two appropriations bills to legislative committees in order to satisfy the demands of members who were dissatisfied by the parsimonious and overworked Appropriations Committee. It transferred the rivers and harbours bill to the Commerce Committee and the agriculture bill to the Agriculture Committee. The members of these committees could then provide money and services to constituents and gain more credit for the achievements under their jurisdiction.

[13] For atomic energy, see Green, Harold P. and Rosenthal, Alan, *Government of the Atom* (New York: Atherton Press, 1963); for Fountain's committee, see Strickland, Stephen P., *Politics, Science, and Dread Disease* (Cambridge, Mass.: Harvard University Press, 1972) and Henderson, Thomas A., *Congressional Oversight of Executive Agencies* (Gainesville: University of Florida Social Science Monograph No. 40, 1970); for the Task Force, see Hamlett, Patrick, "Dialogue on Science and Congress", in Alexander, J. (ed.), *Science, Technology & Politics: 1990 Yearbook* (Ottowa: Odda Tala Press, 1990), pp. 23–74; for Dingell's committee, see Guston, David H., "Congressional Oversight: A Result of Science Advising?", in Thompson, K. (ed.), *The Presidency and Science Advising: Congress, Governance, and Science*, Vol. IX (New York: University Press of America, 1993), pp. 45–71.

This relatively minor transfer of power set the stage for the "devolution of 1885", which was "one of the most important changes in the history of House budgetary politics".[15] The "devolution" decentralised authority over appropriations bills for the Army, the Navy, the Post Office, Indian affairs and foreign affairs to their respective legislative committees. The "devolution" thus rationalised congressional jurisdictions and promoted the expertise of individual congressmen by allowing standing committees to appropriate funds to bureaux for which they also legislated.[16] In this sense, the "devolution of 1885" was akin to the broader movement towards rationalised administration proposed by a series of congressional commissions on administration from 1869 to 1893, as well as by the reform of the civil service enacted in 1883.[17] But despite the aim of economy in government, prompted by the mild depression of 1883 to 1885, the primary effect of the devolution was to reinforce the independence of a broad array of committees and to increase public expenditures.[18] In the midst of this scramble for power and money, the House Appropriations Committee amended the Sundry Civil Bill of 1884 to create the joint commission.

Because committee proceedings of the period were neither open to the public nor published,[19] we do not know who on the House Appropriations Committee proposed the joint commission. In any case, the proposal probably would not have reached the floor of the House without the approval of the chairman of the Appropriations Committee, Samuel J. Randall. Randall, a Philadelphia Democrat and former speaker of the House, was an effective and creative parliamentarian, noted for being a father of the "germaneness rule" for appropriations riders.[20] Randall's committee issued the recommendation for a joint commission in the 48th Congress, and it was his committee that lost much of its power in the devolution of the 49th Congress.

Appropriations, Conflict and the Scientific Bureaux

Being an opportunity to distribute patronage in jobs and to disseminate valuable technical information, the scientific bureaux were the focal point of financial and jurisdictional conflicts in Congress. Members of Congress, concerned about the detrimental effect on the effective pursuit of

[15] Stewart, Charles H., III, *Budget Reform Politics: The Design of the Appropriations Process in the House of Representatives, 1865–1921* (Cambridge: Cambridge University Press, 1989), pp. 98–132.

[16] Nelson, William E., *The Roots of the American Bureaucracy, 1830–1900* (Cambridge, Mass.: Harvard University Press, 1982), p. 115.

[17] White, Leonard D., *The Republican Era: 1869–1901* (New York: Macmillan, 1958), p. 84–92.

[18] Stewart, C.H., *Budget Reform*, *op. cit.*

[19] Wilson, W., *Congressional Government*, *op. cit.*

[20] Thompson, M.S., *The "Spider Web"*, *op. cit.*, p. 92; see also, McConachie, Lauros G., [illegible] (New York: Burt Franklin, 1973 [1898]), pp. 161, 179–190.

their goals, attempted to reduce these conflicts by creating the joint commission. Randall, as a leader of the Democratic majority in the House, opposed the expansion of the bureaucracy under the Republican administration. He had also resisted the financial support of the Coast and Geodetic Survey.[21] Accepting the argument of the Secretary of the Navy, William E. Chandler, that everything on the water should belong to the Navy, Randall inserted into the Sundry Civil Bill of 1884 that the hydrographic work of the Coast Survey should be transferred from the Department of the Treasury to the Department of the Navy.[22]

The proposal aroused considerable resistance. Superintendent Hilgard directed members of the staff of the Coast Survey to solicit support from friends of the bureau. Survey Assistant R.M. Bache "was authorized by the Bureau to correct through the press, false statements with regard to the transfer".[23] Hilgard authorised Bache to write for the *United Service Magazine* on the proposal, and with funds from the Coast Survey, Hilgard printed and distributed 1,500 copies of Bache's work to cabinet members, members of Congress, scientific societies and "eminent scientific men". Hilgard also authorised that Bache be reimbursed for his expenses while writing these articles.[24]

This questionable use of public money eventually came under the scrutiny of the Department of the Treasury in 1886. Meanwhile, members of clubs, academies and universities sent copies of resolutions—which they had previously sent to members of Congress condemning Randall's proposal to transfer the survey—to the superintendent's office. "[I]t is a shame", wrote E.T. Quimby of New Hampshire, "that a Congressman whose brain is not more than two kitten power can kick [the Survey] around like a foot ball [*sic*]." F.A.P. Barnard, president of Columbia College, wrote that this "scheme belongs to the same class with the enlight[ened] proposition recently made by some M.C. Ignoramus, to divide up the Congressional Library into thirty-eight lots [one for each state]".[25] This conflict over the Coast Survey and the response to it were characteristic of the tendency of academics and scientists to portray congressional opposition to the demands of scientists as ignorant and ill-informed. They did not see that these congressional actions were intended to meet other practical ends, separate from—but neither hostile to nor ignorant of—the merits of arguments about scientific effectiveness.

[21] Manning, T.G., *Coast Survey*, *op. cit.*, p. 46.

[22] White, L.D., *The Republican Era*, *op. cit.*, pp. 115–116.

[23] See the letter from R.M. Bache to F.M. Thorn, 9 May 1886, in Records of the US House of Representatives, 48th Congress, HR48A-F3.15, Treasury Department, box 21, RG 233 (National Archives).

[24] *Ibid.*

[25] The material from the Coast Survey includes resolutions from the Engineers Club of Philadelphia, the Academy of Science of St Louis, and faculties of Washington University, MIT, Columbia, and Yale. Miscellaneous Paper, 1870–1889, Superintendent's File, 1866–1910, Records of the Coast and Geodetic Survey, RG 23 (National Archives).

Even Randall's own constituents opposed his plan. *The Philadelphia Telegraph*, published in his own city, railed against the proposed transfer as an example of "false economy".[26] Attempting to explain why Randall should attack the Coast Survey, which was viewed by some as a "nest-egg . . . [for] further production of excellence in civil-service administration", another editorial accused him of betraying the work of his fellow Philadelphian, Alexander Dallas Bache, who was responsible for the "greatness and celebrity of the Survey". The writer explained Randall's betrayal "only by the fact that the multiplicity of business to which members of Congress, and especially committee-men, must attend, renders it often impossible that all measures entertained and discussed by them can be recognized in their true relative proportions".[27]

The argument that the Appropriations Committee was overworked had been advanced by reformers in favour of the "devolution" of the committee's power.[28] The proposal of a joint congressional commission like the Allison Commission by the House Appropriations Committee—to examine an issue like the organisation of the surveys, for which it had so little time and yet drew so much criticism—could both reduce its workload and improve its reputation.

In addition to the burden of excessive work, both the House and Senate Appropriations Committees were under pressure from competing legislative committees, many of which maintained partial jurisdiction over the scientific bureaux: In the two sessions of Congress during which the Allison Commission sat, bills, resolutions and petitions about the Coast Survey were referred to two different committees in the House, and three in the Senate; about the Signal Service, to eight in the House, five in the Senate; about the Hydrographic Office, two in the House and two in the Senate. This dispersion of responsibility offered other committees opportunities to challenge the Appropriations Committee.

The Printing Committees also challenged the authority of the Appropriations Committees. Congress approved printing bills apart from appropriations bills, thus limiting the control of bureaucratic activities and public printing by the Appropriations Committee. Members of Congress generally supported the Printing Committees because they allowed the printing of valuable material that members distributed to their constituents. Maps from the various surveys were especially sought after.[29]

Despite the general uproar over the proposal to transfer the Coast Survey, the Sundry Civil Bill cleared the House of Representatives

[26] Unsigned editorial, *The Philadelphia Telegraph*, found in Miscellaneous Papers, 1870–1889, Superintendent's File, 1866–1910, Records of the Coast and Geodetic Survey.

[27] "The Coast and Geodetic Survey" [1884], unidentified newspaper editorial in Miscellaneous Papers, 1870–1889, Superintendent's File, 1866–1910, Records of the Coast and Geodetic Survey.

[28] Stewart, C.H., *Budget Reform*, *op. cit.*, p. 120.

[29] See, e.g., debates about Coast Survey Reports and Hydrographic Office charts in the *Congressional Record*, 48th Cong., 1st sess., 23 January, 1884, pp. 605–606; 29 January, 1884, p. 712; 6 February, 1884, p. 909; 11 February, 1884, pp. 1014–1015.

without any amendment of this section. As predicted by "Veritas", in a letter to the *Evening Telegraph*, the "recommendation of the Sub-Committee to the Committee is almost tantamount to the acceptance by the Committee . . . and, in turn, the recommendation of the Committee is, through precedent, quite tantamount to the acceptance by the House of the Committee's views".[30] The proposal for transferring the coast work of the Coast Survey to the Navy arrived in the Senate on the same bill as the proposal for a joint commission.

The proposal for the joint commission arrived at an opportune time, because another scientific bureau, the Signal Service, also provided an occasion for conflict in the Senate. In debate on the floor of the Senate, George Pendleton, a reformer and Democrat from Ohio, harassed the chairman of the Senate Appropriations Committee, William Boyd Allison, about the Signal Service. Pendleton suggested that a committee other than the Appropriations Committee should examine the Signal Service. There were no statutory prescriptions of the activities of the Signal Service, and without such prescriptions, all the activities of the service were controlled by the Appropriations Committee, and therefore by Allison. Unless it were friendly to the Appropriations Committee, an examination such as Pendleton had proposed could undermine the power of Allison's committee. But Allison concurred with Pendleton that charging some Senate committee with the examination "would be a very wise thing to do".[31] To facilitate the examination of the Signal Service, Pendleton hastily introduced a resolution requesting the Secretary of War to report on the laws and regulations governing it. Having ordered Pendleton's resolution to be held over until printed, the Senate printed it and referred it to the Military Affairs Committee. Pendleton had wanted his resolution considered on the floor and not referred to a committee, because he expected the Military Affairs Committee to suppress it. Senator Benjamin Harrison, of that committee, called Pendleton's attention to the provision in the Sundry Civil Bill for the joint commission. Senator Harrison deemed the joint commission "a wider, a safer, and a quicker inquiry into this matter" of the Signal Service, and Harrison expressed his hope that Pendleton's resolution would "go over to the Committee on Military Affairs in order that they may consider [which alternative] is better".[32] Pendleton appeared to be unaware of the provision for the joint commission—as did Allison—but when he learned of it, he welcomed it.

[30] "The Coast Survey in Danger", 2 June, 1884, Miscellaneous Papers, 1870–1889, Superintendent's File, 1866–1910, Records of the Coast and Geodetic Survey. For an explanation of the deference to the views of committees, see Shepsle, Kenneth and Weingast, Barry R., "The Institutional Foundations of Committee Power", *American Political Science Review*, LXXXI (1981), pp. 85–105.

[31] *Congressional Record*, 48th Cong., 1st sess., 26 June, 1884, pp. 5622–5623.

[32] *Ibid.*, 48th Cong., 1st sess., 27 June, 1884, p. 5665.

Senator Samuel B. Maxey, also from the Military Affairs Committee, expressed resentment at the prospect of a joint commission deliberating on the future of the Signal Service. Maxey complained:

> [To] take all that work away from the proper committee, which is the Committee on Military Affairs, it seems to me would be wrong. That committee has heretofore had charge of it. The Signal Service Bureau belongs to the War Department, and hence the matters connected with that bureau properly belong to the Military Committee. For every reason it seems to me that the business which has already been intrusted by the Senate to the Committee on Military Affairs, relating to the Signal Service Bureau should be kept there . . . [T]he [Signal Service] subcommittee . . . [has] spent more time . . . upon that single proposition [of transfer] than on any other one proposition that the Military Committee has had under consideration for years.[33]

Pendleton withdrew his motion to have the resolution considered on the floor and it was ordered to be held over until called. If Allison could be assured that the joint commission would not be hostile to his domain in appropriations, such a commission might actually help him to realise Maxey's fears, by wresting control over the Signal Service from the Military Affairs Committee.

Allison and the Joint Commission

Allison held great power in the Senate, both substantively and procedurally. He was chairman of the Appropriations Committee, the power of which had not yet been reduced by "devolution". He later became chairman of the Republican Steering Committee, which scheduled legislation for discussion on the floor, and chairman of the Committee on Committees, which assigned members to committees. Allison's position in the Senate was so powerful and suited to his goals that he rejected an offer, or even two offers, from President Garfield to become the Secretary of the Treasury, an office with an authority, Henry Adams estimated, "rivalling that of the President itself".[34]

The Sundry Civil Bill provided for the appointment of the commissioners by the president of the Senate and the speaker of the House. The president of the Senate named Allison to serve as chairman and Eugene Hale, Allison's colleague on the Appropriations Committee and a fellow Republican from Maine, and George Pendleton to fill out the membership from the upper chamber. Hale had been a representative for a decade before entering the Senate in 1881. He sat on the Appropriations and Naval Affairs Committees and, towards the end of his 30-year career

[33] *Ibid.*

[34] de Boinville, Barbara R. (ed.), *Origins and Development of Congress*, 2nd edn (Washington, DC: Congressional Quarterly Press, 1982), p. 226. For an account of Allison's decision-making regarding the cabinet post, see Sage, Leland L., *William Boyd Allison: A Study in Practical Politics* (Iowa City: Iowa State University Press, 1956), pp. 165–170. Adams is quoted in White, L.D., *The Republican Era*, *op. cit.*, p. 110.

in the Senate, was several times the chairman of the Republican caucus. He was also, with Allison, a member of the School of Philosophy Club, a dinner and card club for Republicans in the Senate.[35] Pendleton had been a representative from 1857 to 1865 and served a single term in the Senate, from 1879 to 1885, during which he sponsored the reform of the civil service in 1883.

The speaker of the House appointed Hilary Herbert, a Democrat from Alabama, Robert Lowry, a Democrat from Indiana, and Theodore Lyman, an independent from Massachusetts, to the joint commission. Herbert was a veteran of the Army of the Confederacy and a "prominent member" of the House from 1877 to 1893.[36] He was chairman of the Naval Affairs Committee several times, and as Secretary of the Navy from 1893 to 1897, launched significant steps towards the modernisation of the fleet.[37] Lowry served only two terms, from 1883 to 1887, and was the chairman of the Committee on Expenditures in the Department of the Treasury in his second term. Lyman, a veteran of the Union Army, served a single term, from 1883 to 1885; he sat on the Military Affairs and Civil Service Reform Committees. He was elected as an independent on the civil service reform platform and also was nominated and ran as a Democrat. The commission was thus slightly slanted towards the Democrats, but the chairman and the most senior members were Republicans. Of all the members of the commission, only Lyman had scientific qualifications; he was a geologist trained by his father-in-law Louis Agassiz, and a member of both the National Academy of Sciences and the American Academy of Arts and Sciences.

A bicameral position of prestige and influence, the chairmanship of the joint commission was a perfect place for Allison. The early career of the "sage of Dubuque" was a caricature of the nineteenth-century member of Congress. He was first elected to the House from a gerrymandered district in 1862 after the leading Democratic candidate, D.A. Mahoney, was arrested and thrown into the Old Capitol Prison by a friend of Allison in order to assist him in the election. Like most of the Iowa delegation, Allison was a Radical Republican and served "railroad interests". He retired from the House in 1871 with an eye towards the Senate. The Iowa legislature sent him there in 1873 and every six years thereafter until his death in 1908—this was before senators were elected by popular vote. Allison was implicated but not censured in the scandal of the Credit Mobilier, but he was also a "conscientious and indefatigable committee member" whose willingness "to go along" enhanced his

[35] Rothman, David J., *Politics and Power: The United States Senate, 1869–1901* (Cambridge, Mass.: Harvard University Press, 1966), pp. 45–46.

[36] As identified by Moore, Joseph West, *The American Congress: A History of National Legislative and Political Events* (New York: Harper and Brothers, 1895).

[37] Hagan, Kenneth J., *This People's Navy: The Making of American Sea Power* (New York: Free Press, 1991), esp. ch. VII.

reputation as a compromiser and as a bimetallist.[38] Allison did not "hasten to defend civil service reform", but he supported the Pendleton Act and offered "good faith" amendments to it. "He combined the constitutional powers inherent in his official position with a very effective and tenacious hold on the extra-legal government."[39]

Allison thus seemed likely to make the joint commission into an instrument to increase his own power and that of his Appropriations Committee. He welcomed the joint commission to examine the scientific bureaux, perhaps for the same reason that he had opposed the creation of tariff commissions in the early 1880s: "I do not need their opinion or their judgment with reference to the reduction of tariff duties upon sugar . . . [or] upon Bessemer steel . . . I have a judgment of my own with reference to those questions and I am ready to vote on them whenever they are presented."[40] Allison opposed the independent tariff commissions because he did not want to yield authority and jurisdiction to them. He perhaps intended to use the joint commission to consolidate the authority and jurisdiction of the Appropriations Committee.

The Meigs Committee

As its first official act, the Allison Commission requested the National Academy of Sciences to examine the organisation of the scientific bureaux and report by 1 October, 1884. Lyman wrote the commission's letter of request to O.C. Marsh, president of the academy, on 9 July, 1884. Lyman's role other than as sole signatory on the letter is unclear. Professor Dupree suggests that Lyman "had little chance for re-election, but he used the closing months of his single term to launch the commission for which he had such preminent qualifications".[41] I find no evidence of an official or an unofficial role for Lyman in the "launching" of the commission other than this letter. Indeed, Lyman's own account is singularly modest. A terse diary, including some entries that note the commission's meetings, is all he left about his brief congressional career. We may never learn exactly what role Lyman had; he wrote on 9 March, 1885, five days after the expiration of Congress in which he served: "Throwing away old Congressional correspondence."[42]

[38] See Sage, L.L., *William Boyd Allison, op. cit.* Allison's other biography is Cooper, Vernon, *"The Public Career of William Boyd Allison"*, doctoral dissertation, State University of Iowa, 1927. Both rely on his collected papers, and neither presents any material about the joint commission.

[39] See Cooper, V., *Public Career, op. cit.*, pp. 295–297, 299.

[40] Quoted in *ibid.*, pp. 314–17.

[41] Dupree, A.H., *Science, op. cit.*, p. 215.

[42] See The Papers of the Lyman Family, Vols 40–43, Manuscript Division (Library of Congress). Letter from T. Lyman to O.C. Marsh in US Congress, *Testimony Before the Joint Commission to Consider the Present Organizations of the Signal Service, Geological Survey, Coast and Geodetic Survey and the Hydrographic Office of the Navy Department*, Senate Miscellaneous Document 82, 49th Cong., 1st sess., 1886, as reprinted in Cohen, I.B. (ed.), *Three Centuries of Science in America* (New York: Arno Press, 1980), *1–*2.

Marsh appointed a committee that worked while members of Congress, not in session, prepared for the election of November 1884. General M.C. Meigs, the chairman of the committee of the National Academy of Sciences, submitted the committee's report on 21 September, 1884, and Marsh transmitted it to Lyman two weeks late, on 16 October, with voluminous documentation.[43] The Meigs committee itself was not without controversy. After it had met twice, in New York on 9 September and in Washington on 19 and 20 September to draft the report, the Secretary of the Army, Robert T. Lincoln, raised questions about the committee's membership.[44] Two of its members, Simon Newcomb of the Nautical Almanac Office and Colonel Cyrus Comstock of the Corps of Engineers, were federal employees and were barred by their respective secretaries from making recommendations that could influence policy.[45] But since the conflict was not brought to Meigs's attention until after the report had been drafted, the participation of Newcomb and Comstock in its deliberations was a *fait accompli*, and they simply refrained from signing the report. The report issued by the Meigs committee, one of the two important committees of Marsh's tenure as president of the National Academy of Sciences, was the first of the academy's reports not to be approved by its entire membership.[46] Alexander Agassiz resigned from the academy over the report, although he was later offered honorary membership and reinstated as a full member.[47]

The Meigs report responded to the general charges to the academy in Lyman's letter, to examine the organisation of scientific bureaux in Europe, to recommend how the bureaux might best be co-ordinated, and to ask "[w]hat changes in or additions to these branches are desirable?"[48] The academy's report made few specific recommendations that were not derived from its previous report on the various surveys, in which it recommended the consolidation of the coastal and interior work of the Coast Survey with the Geological Survey under the Department of the Interior and the eventual transfer of the hydrographic work of the Coast Survey to the Navy.[49] But the Meigs panel expanded these findings by

[43] "Schedule of letters and papers to accompany the Report of the Committee of the National Academy of Sciences on Government Scientific Organizations." File of the Committee on the Signal Service of the Army, the Geological Survey, the Coast and Geodetic Survey, and the Hydrographic Office of the Navy Department (National Academy of Sciences Archives).

[44] M.C. Meigs to R.T. Lincoln, 25 September, 1884 (National Academy of Science Archives).

[45] R.T. Lincoln to M.C. Meigs, 11 October, 1884 (National Academy of Sciences Archives).

[46] X., "Reformation of Scientific Legislation", *Science*, V (17 April, 1885), pp. 325–332.

[47] Cochrane, R., *The National Academy*, *op. cit.*, p. 149.

[48] T. Lyman to O.C. Marsh in US Congress, *Testimony Before the Joint Commission*, *op. cit.*, pp. *1–*2.

[49] For a complete account of the academy report of 1878, see Turner, S.P., "The Survey", *op. cit.*; True, F.W. *History of the National Academy*, *op. cit.*; and Cochrane, R., *The National Academy*, *op. cit.*

suggesting that all the scientific bureaux be placed under a single department in the cabinet, either a new department of science or one of the established departments such as the Department of the Interior.[50]

The committee of the National Academy of Sciences made these recommendations with reference to three explicit principles of science policy: "Congress should not undertake any work which can be equally well done by the enterprise of individual investigators"; government should not compete with universities; and government support "should also be confined to the increase and systematization of knowledge tending 'to promote the general welfare' of the country".[51]

Like the form of the inquiry represented by the joint commission and the form of patronage advocated by Powell, these premises have proved very durable. In recommending a department of science and stating these foundations of science policy, the Meigs committee dealt with what were probably the most important issues to its membership. But it did not deal with, and perhaps it did not even anticipate, the interest of the members of the Allison Commission in gaining jurisdiction over the scientific bureaux and in asserting congressional control over the expanding scientific programmes. The inquiry of the Allison Commission, and the ensuing debate it spurred in Congress, focused neither on the higher administrative organisation and co-ordination of the scientific bureaux, nor on the types of research the government should support. Instead, the primary areas of attention were the internal workings of the bureaux and how they could be controlled by Congress. The Allison commissioners were interested in whether the bureaucratic and scientific work was organised and authorised to promote their own goals of service to constituents and their power in the chamber. The Allison Commission therefore concentrated on these aspects.

The Work of the Joint Commission

The Allison Commission held its first meeting on 3 December, 1884, reading the report of the National Academy of Sciences and visiting the office of the Coast Survey.[52] Delayed by the late transmission of the report, and perhaps confounded by its contents, the commission had to seek new legislation (S.R. 98) to extend its charter beyond the closing date of the third Monday in December that had been specified in the Sundry Civil Bill.[53] By this time, Lyman and Pendleton had failed to gain re-election and were completing the winter session before returning

[50] For more complete discussions of the panel, see Dupree, A.H., *Science*, *op. cit.*, True, F.W. *History of the National Academy*, *op. cit.*, and Cochrane, R., *The National Academy*, *op. cit.*

[51] US Congress, *Testimony Before the Joint Commission*, *op. cit.*, p. *7.

[52] Lyman Family Papers, *op. cit.*, Vol. 42.

[53] *Congressional Record*, 48th Cong., 2nd sess., 9 December, 1884, p. 132; and 11 December, 1884, p. 174.

home. John Wait, Lyman's replacement on the commission, suggested that Lyman's membership may have had a role in his failure to be re-elected.[54] It is quite possible that preparing for the commission's work distracted Lyman from his duties to his constituents—during his first session in office, he introduced only two relief bills and one pension bill. It is also possible that his vigour as a politician and campaigner was reduced by Parkinson's disease, diagnosed during the summer of 1884 and for which he received treatments of arsenic and strychnine.[55]

Pendleton failed to return to the Senate because the Democrats refused to back his candidacy. They had wanted him to delay his civil service bill until it could be used after their anticipated presidential victory in 1884, in order to secure new Democratic appointees rather than the current Republican appointees. Pendleton nevertheless introduced the bill—which passed with much Republican support—and he was not returned to the Senate. In creating a professional civil service free of political patronage, the Pendleton Act secured Republican appointees in the civil service. The new Cleveland administration in 1885 ran short of posts for awarding patronage to its supporters; it is possible that this difficulty instigated the hunt for corruption in the bureaucracy that so troubled the Coast Survey in particular.[56]

The early hearings of the commission during the closing days of the 48th Congress were dominated by senior officials such as Powell, Hilgard and Hazen, and cabinet members, Lincoln and Chandler. Their testimonies reflected the academy's proposals for the organisation and co-ordination of the bureaux and the criteria for the support of the government's scientific work. Powell lectured the commission on the two classes of scientific work conducted by the government: the "constructive work" of "applied science", performed, for example, by the Corps of Engineers; and the "original investigation" that "purely scientific institutions", such as the Geological Survey, the Coast and Geodetic Survey, and the Signal Service were "designed for". Because such scientific institutions required constant modification, Powell argued, "[i]t will thus be seen that it is impossible to directly restrict or control these scientific operations by law". Congress, he reasoned, could provide only general guidance. Such guidance held that "scientific institutions of the Government should be placed under one general management" and that "central bureaus engaged in research should be left free to prosecute such research in all its details without dictation from superior authority".[57]

[54] Wait's statement in *Congressional Record*, 49th Cong., 1st sess., 29 June, 1886, p. 6295.
[55] Lyman Family Papers, *op. cit.*, Vol. 42.
[56] For Pendleton's story, see Skowronek, Stephen, *Building a New American State: The Expansion of National Administrative Capacities, 1877–1920* (Cambridge: Cambridge University Press, 1982), p. 66. On the shortage of patronage positions, see Dupree, A.H., *Science*, *op. cit.*, p. 222.
[57] US Congress, *Testimony Before the Joint Commission*, *op. cit.*, pp. 23–26.

According to Powell, not only the character of science, but the character of scientists as well, determined governmental organisation for research because "scientific men are, as a class, the most radical democrats in society", and they become "restive and rebellious when their judgments are coerced by superior authority".[58] Thus Powell argued for the "pure-science ideal", pressing one step further, relying on the unique organisation and composition of the scientific community to advance science without political guidance or interference.[59] He set out the issues for this contention between entrepreneurs of science policy and political entrepreneurs who desired congressional control.

The ambiguity of the ideal of pure science was demonstrated by the fact that the bureau chiefs were not of one voice. For example, Hilgard disagreed with Powell about the scientific status of the Coast Survey. He did "not like to have the work of the [survey] considered in the light of what you properly call scientific. . . . [I]t is economic, of practical value . . . for practical purposes, though some science comes of it".[60] Chandler also said that the nature of scientific investigation and governmental organisation required that science, as a tool, be organised functionally by department, thus supporting his argument that everything that floated belonged to the Department of the Navy.[61]

Despite differences in opinion among the witnesses about the ideal organisation of governmental science, all shared a similar vision: the bureaucrats believed that persuading the Allison Commission to share their view of the nature of science would cause it to accept their normative beliefs about the organisation of science. However, this approach did not acknowledge the political interests of the commission. Lyman, scientist and civil service reformer, attempted to bridge the gap by announcing that "the whole of this question before the Commission concerns administration. That is the way I understand it, economical and effective administration". He pursued Powell on this point further after Powell suggested that the "correlation" or intellectual unity of the sciences prescribed a single bureaucratic unit. Lyman replied that even with such a "correlation", the commission still retained a choice between consolidation and subdivision. "Therefore, as you understand it, Major, it is a matter with respect to administration, is it not?"[62] Lyman argued, contrary to Powell, that there was nothing inherent in the nature of scientific investigation to limit congressional discretion over the organisation of research.

As the hearings progressed, and especially when the Allison Commission reconvened during the 49th Congress, attention was concentrated on

[58] *Ibid.*, p. 381.
[59] Daniels, George H., "The Pure-Science Ideal and Democratic Culture", Science, CLVI (30 June, 1967), pp. 1699–1706; and Turner, S.P., "The Survey", *op. cit.*
[60] US Congress, *Testimony Before the Joint Commission*, *op. cit.*, p. 54.
[61] *Ibid.*, pp. 66–67.
[62] *Ibid.*, pp. 71, 185–186.

administration within the bureaux and on how the quality of this administration was linked to appropriations and legislation. The commission reconvened with its new members. In place of Pendleton and Lyman, the president of the Senate and the speaker of the House added John T. Morgan, like Herbert a Democrat from Alabama, and John Wait, a Republican from Connecticut. Morgan, a veteran of the Civil War, sat on the Public Lands, Foreign Relations and Indian Affairs Committees. He served in the Senate from 1877 until 1907. Wait had begun his service in the House in 1876, and did not seek re-election in the next Congress.

The inquiry of the renewed Allison Commission continued, descending deeper into the mire of bureaucratic operations. The testimony of one witness after another about the poor quality of the food at Fort Myer, Virginia—the training school for the Signal Service—raised eyebrows on the commission. So did the nature of military discipline and the allegedly abusive treatment of "college men" enlisted in the service. Members of the class of 1885 and 1886 at Fort Myer testified that it was "a school of discipline" rather than a "school of instruction", and complained that the coffee grounds were removed from the pot only once a week. The officers at Fort Myer had a different perspective. When asked by Senator Morgan if the mode of life at the fort was appropriate for gentlemen engaged in scientific inquiry, Lieutenant J.A. Swift replied, "I do not see what that has to do with it". A second officer, indignant at the "college men's" disdain for menial tasks, asserted that "[e]very soldier in the world has to do policing". In reaching down into matters of administrative detail, the commission heard that the military signal personnel "[h]ave not seen any enemy except those in the post" and that "the alleged military training at Fort Myer is merely a burlesque on military rules and regulations".[63]

The Allison Commission continued its examination of the internal workings of the bureaux. A primary issue for the Coast Survey was whether reimbursements for the out-of-pocket expenses of its employees were too high. The commission also examined the promotion of Signal Service officers and the exact number of officers required. With respect to the Geological Survey, the Allison Commission examined the nature and number of its publications; it also questioned Powell's technique of contracting out work to scientists such as Marsh at Yale University, who had been accused of using materials collected with governmental support for private museum collections and of receiving salaries from both Powell and the university. Whereas the former charge may have had some grounds, Marsh was not guilty of drawing two salaries.[64]

These topics of administration within each bureau captured the attention of members of the commission because such details provided an

[63] *Ibid.*, pp. 565, 749, 791, 568.

[64] See O.C. Marsh to H. Herbert, 5 July, 1886, Papers of O.C. Marsh, HM 38 (Yale University Manuscripts and Archives).

important link between members of Congress and their constituencies—the way patronage was distributed through the bureaucracy to persons favoured by members of Congress, gave the details of printing, pay, food and morale extra significance. The scientific bureaux, particularly Powell's, were noted distributors of patronage. Powell "obliged dozens of congressmen, many of them members of appropriations", by awarding temporary employment in field-work to congressional relatives and key constituents.[65] The Signal Service was "made popular in this country by spending money freely in all parts of the country".[66] Further, bureaucratic performance was a measure of congressional performance, particularly in an era when reform of the civil service was a potent issue. Indeed, these minutiae are what Professor Stephen Turner calls "synecdoches" for congressional control.[67] Because Powell's contention that detailed control of science was beyond the grasp of members of Congress was to some extent correct, members sought out the details they could master—publications, promotions, jurisdiction—in order to control the entire enterprise better.

When these issues from the Allison Commission returned to the congressional floor, the ones attracting attention and action were again not the co-ordination of the bureaux and the proposal for a department of science, but the issues of internal administration of bureaux and how they related to Congress. As Woodrow Wilson wrote, "There is no distincter tendency in congressional history than the tendency to subject even the details of administration to the constant supervision [of congressional scrutiny]".[68] This was certainly true of the Allison Commission.

The Influence of the Allison Commission

The joint commission had been initiated by a short section of the Sundry Civil Bill of 1884. This section had been added by the House Appropriations Committee, which had had little time to consider the problems of the scientific bureaux in detail. The proposal survived in the Senate because Allison, chairman of the Appropriations Committee, thought he could use it to maintain or expand his committee's power. The Allison Commission consumed the time of six busy members of Congress, produced over 1,000 printed pages of testimony, and spent $1490.50 in public money.[69] What did it do?

[65] Manning, T.G. *Geological Survey*, *op. cit.*, pp. 130–131.

[66] Brigadier General D.S. Stanley to J.T. Morgan, 14 June, 1886, in an enclosure entitled "The Hazen Inquiry", Papers of John Tyler Morgan (Library of Congress).

[67] Turner, Stephen P., "Forms of Patronage", in Cozzens, S.E. and Gieryn, T.F. (eds), *Theories of Science in Society* (Bloomington: University of Indiana Press, 1990), pp. 185–211.

[68] Wilson, W., *Congressional Government*, *op. cit.*, p. 47.

[69] See Abstracts of Expenditures of the United States, 1791–1888, Vol. 1, p. 60, RG 217 (National Archives).

The Allison Commission behaved largely as Woodrow Wilson might have surmised; although it spent some time reflecting on generalities of the government of science, it focused its searching eyes on the details of administration. For its failure to act on the National Academy's proposal for a department of science, Professor Dupree has written that "by taking no action at all, the Allison Commission both affirmed the worth of government science and denied the validity of a separate department for it".[70] But the commission did take some action. By not allowing the report of the academy to set the agenda for their inquiry, the members of the commission responded directly to the proposals of the entrepreneurial scientists.

If it is true that the primary reason for the creation of the Allison Commission was to respond to the difficulties experienced by the Appropriations Committees, then its successes and failures should be apparent in the outcome of jurisdictional questions of administration and the power of committees, rather than in substantive questions of science in government. For even if Powell had successfully argued for a new policy of support for science, and the Allison Commission took no overt action to reorganise governmental science, it might in fact have been making more subtle moves to assert or extend its influence over the scientific bureaux.

The Allison Commission issued reports and bills based on the record it produced. On 26 April, 1886, Hilary Herbert reported H.Rpt 1931 to the House of Representatives, to accompany a bill (H.R. 8320). The report was not printed, and later, on 5 May, Herbert introduced a new report (H.Rpt 2214) and a revised version of H.R. 8320. On 8 June, 1886, Allison reported S.Rpt 1285 to the Senate, to accompany two bills (S. 2620 and S. 2621).

The fate of these reports and bills is obscure, but must be appreciated in order to understand how the Allison Commission viewed the scientific bureaux and how it sought to control them. The bills achieved no success on the floor of either chamber of Congress, but some language from them found its way into law through additions to appropriations bills. The legislation which flowed from the Allison Commission is a result of its work not previously recognised by historians. More important, perhaps, than recognition of this result is the fact that the changes enacted by these riders to appropriations bills were related to the general organisation of science only in consequence of congressional concern for control over tangible aspects of the scientific bureaucracy. Even if the Allison Commission had taken "no action at all" with respect to a department of science and the recommendations of the National Academy of Sciences, it had acted to ensure the continued congressional control of science.

Just as the scientific entrepreneur Powell established a new form of patronage which took into account the character of scientific consensus,

[70] Dupree, A.H., *Science*, *op. cit.*, p. 231.

so too the Allison Commission established the principle of strict fiscal accountability in exchange for relative freedom for scientific programmes. Further, the commission's unwillingness to act on the organisation of science was not a result of its affirmation of the existing organisation as a matter of science. It was rather a matter of congressional control. Indeed, some of the heretofore overlooked legislation changed the structure of the congressional administration of the bureaux. The Allison Commission established the principle that the organisation of governmental science would not necessarily correspond to any disciplinary, programmatic or scientific claims. It would be determined by congressional organisation and administration of the bureaux in general, and by scientific goals only incidentally.

One of the issues that had made the joint commission attractive to the Senate was the status of the Signal Service. The substantive question of organisation was whether the character of Signal Service research required military or civilian control. The jurisdictional question appeared in discussions about the location of authority for appropriations for the service. If, as a military organisation, it received these through the budget of the War Department, then the Military Affairs Committee could legitimately claim jurisdiction. A civilian service, on the other hand, could exclude the Military Affairs Committee. At stake was the credit for establishing weather and telegraph stations that provided the benefits of weather prediction and communication to the farmers and other inhabitants of the region where the Signal Service stations were built. The committee maintaining jurisdiction over the Signal Service could thereby ensure that the constituents of its members were well-served by weather stations, and could use the establishment of stations in other districts to gain the favour of other committees.

The commissioners agreed on the nature of the scientific work of the Signal Service, but divided over its fate. "All concur in the opinion that this work is civil work in its nature and character, and that military restraint is not necessary [to secure accurate and reliable weather observations]."[71] But whereas Allison, Hale and Lowry argued that it was not apparent how the already efficient work would be improved by moving it to a civilian department, Morgan, Herbert and Wait believed that a "change in this ['mixed military and civilian regimen'] can be made and ought to be made at a given time by abolishing the present corps of soldiers in name who are not soldiers in fact, but a mere uniformed police to watch the weather and watch each other".[72]

The division among the commissioners—one Eastern Republican, one Western Republican and a Western Democrat against two Southern

[71] US Congress, *Report of the Joint Commission to Consider the Present Organizations of the Signal Service, Geological Survey, Coast and Geodetic Survey and the Hydrographic Office of the Navy Department*, Senate, 49th Cong., 1st sess., S.Rpt 1285 (Ser. 2361), 8 June, 1886, p. 19.

[72] *Ibid.*, p. 55.

Democrats and an Eastern Republican—does not easily suggest a partisan or regional line of division. Allison and Hale, from the Appropriations Committee, were not concerned with the scientific significance of the administrative location of the Signal Service. They were concerned with the jurisdictional issues, which had just been settled to their satisfaction. On 28 May, 1886, before the commission issued its report, Congress received a letter from the Secretary of War, William C. Endicott, stating that "[a]ll appropriations for the Signal Service are omitted from this [Army appropriations bill], because in the judgment of your committee the entire appropriation for this service should be included in one bill [the Sundry Civil Bill]".[73] Lowry may have gone along with Allison and Hale because the transfer of the appropriations was arranged through the Democrat Randall in the House of Representatives. Thus, appropriations for the Signal Service were transferred from the Army bill to the Sundry Civil Bill by the consent of the Secretary of War and the House Appropriations Committee.

Allison, Hale and Lowry, satisfied with the new location of authority for appropriations for the Signal Service, did not require the location of the service itself to be changed. To do so would have meant supporting Morgan's bill (S. 2282) that the Senate had referred to the commission. This bill would have established the Signal Service and its Weather Bureau as a civilian bureau within the War Department. While such a bill might have implied the transfer of appropriations from the military to the civil budget, it certainly did not require it; and the bill permitted the Military Affairs Committee to contend for jurisdiction by keeping the civilian service within the War Department. Morgan's bill satisfied the substantive goals by recognising the work of the Signal Service as civilian in nature, but did not achieve the jurisdictional goal of separating jurisdiction over appropriations for the service from the military. Allison, Hale and Lowry did not support the bill and the commission never reported it to the floor.

A second jurisdictional conflict occurred over the issue of public printing. Printing had been a contentious issue since the 47th Congress, when a special commission on printing issued a report that was impressed with the quantity and variety of government printing, but was "no less deeply impressed with the lack of system and economy in the distribution of these [public] documents . . . [which] to no small extent . . . are sent in duplicate and triplicate to the same parties".[74] In the same vein, the Allison Commission criticised the printing done by all four bureaux and

[73] See Letter from the Secretary of War with accompanying documents, folder 78–95, box 26, Papers from or about the Treasury Department, HR49A-F3.15, Records of the US House of Representatives, 49th Congress, RG 233 (National Archives); also, *Congressional Record*, 49th Cong., 1st sess., 28 May, 1886, p. 5030.

[74] *Publication and Distribution of Public Documents*, House Miscellaneous Document 12, 22 December, 1882, p. 2.

reported legislation "to limit" it (H.R. 8320, H.R. 9372, S. 2621). Specifically, the proposed legislation ordered that "all printing and engraving . . . shall hereafter be estimated for separately and in detail, and appropriated for separately for each of said Bureaus". That is, in order for these bureaux to spend public money printing their reports, they could no longer rely merely on joint resolutions for consideration on the floor of Congress to print a certain number of reports. They would need an estimate from the public printer for concurrent resolutions; otherwise they would have to traverse the complete appropriations process, crossing Allison's domain in the process. The bills sought in no way "to limit" the amount of printing, but they changed the procedure for and the locus of control over printing. The bills would thus expand the jurisdiction of the Appropriations Committee at the expense of the Printing Committee for the nominal purpose of limiting printing.

Neither the House nor Senate debated these bills on the floor. When the Senate bills came up on the calendar for consideration, Joseph Dolph objected to the Signal Service bill and Benjamin Harrison to the printing bill, so both bills were passed over.[75] When they came up on the calendar again, Senator John Ingalls objected and they were again passed over. The bills did not come up again for consideration. Thwarted on the floor by the rule allowing a lone Senator opposing a bill to postpone its consideration, Allison altered his strategy to use his Appropriations Committee to advance the commission's bills. When Allison reported the Sundry Civil Bill of 1886 (H.R. 9478) from his Appropriations Committee, the committee had amended the public printing section to add language identical to that providing for specific appropriations for printing from S. 2621.

Challenging an amendment offered by the Appropriations Committee was more dangerous and difficult than objecting to a bill reported for consideration, since it required a member to expose himself to the wrath of the Appropriations Committee, which had primary control of the distribution of financial benefits. Even if that were risked, it still required a yea or nay vote by the chamber. As the letter by "Veritas" had stated, "the recommendation of the Committee is . . . tantamount to the acceptance by the [chamber] of the Committee's views".

Allison's printing amendment survived House as well as Senate consideration and the President signed it into law.[76] Commencing the following year, specific appropriations limits for the scientific bureaux appear as items under their respective departments in the public printing section of the Sundry Civil Bill.[77] And when a joint resolution (S.R. 94) to print

[75] *Congressional Record*, 49th Cong., 1st sess., 17 June, 1886, p. 5820. I can find no reference to the bills coming up in the House.

[76] Sundry Civil Appropriations, ch. 902, 24 Stat. 255 (1886), (in 49th Cong., 2nd sess., H.R. 10072).

[77] See H.R. 10072, 49th Cong., 2nd sess.

copies of the annual report of the Geological Survey was referred to the Senate Printing Committee, the committee had to report back a new concurrent resolution that specifically estimated the costs of printing at $26,000 in order "to comply with the provisions . . . of the Revised Statutes".[78]

Limitations on the number of Signal Service officers more or less followed the same path. After being passed over because of objections, as the printing bills had been, language limiting the number of second lieutenants in the Signal Service to 16 appeared in the Sundry Civil Bill. That "no money herein appropriated shall be used for pay and allowances of second lieutenants appointed or to be appointed from the sergeants of the Signal Corps . . . in excess of the number of sixteen" became law.[79] The printing and Signal Service restrictions, proposed as legislation by the Allison Commission but passed over on the floor of Congress, became law through the manipulation of the appropriations process.

A third goal of the commission became law through the strategic use of appropriations. The Allison Commission had unanimously recommended "dispensing with the school of instruction at Fort Myer".[80] On 30 June, 1886, Randall reported an amendment to the Sundry Civil Bill providing "[t]hat no part of the appropriations made for the Signal Service by this act shall be used for the maintenance or support of a school of instruction nor of the military post at Fort Myer, Va".[81] Opposition on the floor to this amendment was significant, and heated debate followed in which the amendment was challenged by a point of order claiming that the amendment contradicted statutory law and should not be allowed in an appropriations bill; this was the "germaneness rule" that Randall himself had championed. The chairman ruled against the point of order. Randall cited the recommendation of the Allison Commission to dispense with the school, and Herbert spoke to support Randall. Opponents of the amendment moved to strike it out, but in the subsequent vote, Randall and Herbert won, 70 to 26. Although no quorum existed, and one of the opponents called out this fact to the chairman "instantly and loudly, but . . . was unable to be heard", Randall claimed that "[i]t is too late" and he moved that the House consider the consular and diplomatic bill.[82] The House agreed to Randall's motion, and the prohibition of the school of instruction remained on the Sundry Civil Bill. The prohibition cleared the Senate as well and another recommendation of the Allison Commission was signed into law.[83]

The commission led to a fourth jurisdictional confrontation involving appropriations. With regard to the Geological Survey, "Congress

[78] S.Rpt 1864, 50th Cong., 1st sess., 19 July, 1888.
[79] Sundry Civil Appropriations, ch. 902, 24 Stat. 247 (1886).
[80] US Congress, *Report of the Joint Commission*, *op. cit.*, p. 18.
[81] *Congressional Record*, 49th Cong., 1st sess., 30 June, 1886, p. 6359.
[82] *Ibid.*, 49th Cong., 1st sess., 30 June, 1886, p. 6361.
[83] Sundry Civil Appropriations, ch. 902, 24 Stat. 249 (1886).

demanded [from the Geological Survey] an itemized request for funds so it could control other expenditures".[84] Previously, the bulk of the budget of the Geological Survey had been given by one line in the Sundry Civil Bill. In the second session of the 49th Congress, after the reading of that line pertaining to the Geological Survey and its appropriation of $400,000, Herbert asked Randall: "why it is that these expenses of the Geological Survey are put down in a lump sum of $400,000 [when] the expenses of the Coast and Geodetic Survey are all itemized, running through thirteen pages . . . Here are $400,000 in a lump sum for . . . a very extravagant bureau extravagantly conducted. Unless there is itemizing, it is absolutely impossible, if it is desired to make an amendment, to know how to get at it."[85]

Randall agreed that itemisation would be a good idea, but puzzled over why it came up just then. As Randall continued to describe how his predecessor Frank Hiscock, a Republican from New York, started the itemisation of the Coast Survey and how he, Randall, completed it the previous year, Herbert prepared the amendment; the clerk read it, and the House agreed to it.[86] When the Sundry Civil Bill reached the Senate, Allison and his colleagues agreed to the amendment in substance, but hedged on the intent by adding to the requirement for itemisation the phrase "as far as may be practicable".[87]

It is no surprise that the Allison Commission did not recommend the itemisation of appropriations for the Geological Survey because such a recommendation would have reduced the power of the Appropriations Committee. Members could not fathom the lump sum on the floor and thus could not knowingly amend it. Herbert's complaint to Randall was correct.

The surveys that predated the Geological Survey were built up incrementally through appropriations, rather than by statute. The Geological Survey itself was, "as one protesting senator put it, 'nakedly the creature of an appropriations bill—it has no other father or mother' ".[88] Allison and Herbert both acknowledged the dubious parentage of the Geological Survey.[89] But Herbert's argument notwithstanding, the centralisation of appropriations was intended to prevent, not to encourage, "extravagance".[90] The lump-sum appropriation could allow the Appropriations

[84] Rabbit, Mary C., *A Brief History of the U.S. Geological Survey* (Washington, DC: US Department of the Interior, 1979).
[85] *Congressional Record*, 49th Cong., 2nd sess., 15 December, 1886, p. 197.
[86] *Ibid.*
[87] *Ibid.*, 49th Cong., 2nd sess., 1 February, 1887, p. 1222.
[88] Quoted in Schuchert, Charles and LeVene, Clara Mae, *O.C. Marsh, Pioneer in Paleontology* (New Haven: Yale University Press, 1940), p. 314.
[89] See US Congress, Report of the Joint Commission, *op. cit.*, pp. 28-37; and Herbert, Hilary, "Restricting the work and publications of the Geological Survey, and for other purposes", H.Rpt 2214, 49th Cong., 1st sess. (Ser. 2441).
[90] Stewart, C.H., *Budget Reform*, *op. cit.*, p. 122.

Committees to hide in the face of bills such as H.R. 4938 (49th Cong., 1st sess.) to provide $15,000 for the continuation of the Geological Survey in the sponsor's home state. Although many Western interests opposed Powell's views on the development of the arid lands, some Westerners in the House challenged Herbert on his criticism and attempted restriction of the survey.[91] If permitted by the Appropriations Committee in the Senate, which had a non-Western bias, the Geological Survey could have become an even more powerful force for the distribution of patronage than it was, and thus even more expensive.[92] Randall may have concurred with Herbert because Herbert confronted him on the floor with an amendment that was associated with the same decentralising reforms of the "devolution of 1885" that had recently stripped away much of Randall's power. Or Randall may have been seeking the same time-saving, extra-committee assistance he sought in moving the joint commission provision forward. Or he may have thought Herbert's suggestion a good way of curbing the bureaucracy. Allison, not wanting to face similar losses, agreed to the itemisation "as far as may be practicable". Of course, it would be Allison's Appropriations committee that would decide the extent of practicability. In any event, the subsequent itemisation of the Geological Survey did not quite reach the detail of the appropriations for the Coast Survey. Although the Sundry Civil Bill in the 50th Congress (H.R. 10540) itemised "the salaries of the scientific assistants of the Geological Survey", which accounted for $67,000 of the $400,000 appropriated, it still lumped together $100,000 for the geological survey, including temporary pay and instruments, and $199,000 for the topographic survey.

In each of these four instances—the location of the Signal Service, the limits on printing by the bureaux, the number of Signal Service officers, and the itemisation of appropriations for the Geological Survey—the Allison Commission left a mark. This mark did not alter the course of the bureaucratic organisation of science, but it did affect the way Congress controlled the scientific bureaux. Powell had claimed that "it is impossible to directly restrict or control these scientific operations by law"; but the Allison Commission invented some indirect means of controlling the setting in which scientific operations were conducted. The commission asserted its authority to investigate and set the scale of scientific research in detailed appropriations, the personnel of research in Signal Service offices, and the reporting of the research through public printing. The commission affected the conditions under which scientific work was done in government without intruding into scientific work itself.

Hilary Herbert and Hostility Towards Science

The political activities of the Allison Commission were the politics of appropriations, jurisdiction and the congressional control of administration. Science policy for the Allison Commission was in this manner little different from other policy for the Congress of the 1880s. But the commission had to take the action it did, in the face of innovators like Powell, to keep science policy accountable to congressional authority like the other activities of the bureaux. The member of the commission who championed this position most outspokenly was Hilary Herbert.

"Radically democratic",[93] advocate of *laissez-faire*, witty and well-read, Herbert has been miscast because of his rhetoric, his reports and his bills. Professor Dupree portrays Herbert, who "came forward to flay Powell and the Geological Survey", as engaging in a crafty hostility towards science: "By reporting the bills first [H.R. 8320], Herbert managed to convey the idea that they came from the whole commission."[94] For Professor Kevles, Herbert had "decided to wage war on federal research".[95] To Professor Manning, Herbert's "sweeping objective was the destruction of the government's two leading scientific agencies".[96]

Herbert was indeed a forceful critic of the scientific bureaux. But just as the Allison Commission as a whole was less interested in the general organisation of governmental science, Herbert was not so much "anti-science" as he was "pro-Congress" and "pro-accountability". One Alabaman wrote to Morgan that he was "a little surprised to see that Col. Herbert appears to be [ill-] disposed" towards the Geological Survey "for some years ago he made a point of getting the Assistant U.S. Geologist then in Alabama to make some examinations in his district and he seemed then to be very much in sympathy with the Survey".[97]

Herbert's "war" on the Geological Survey consisted of a bill (H.R. 8320), the minority report (H.Rpt 2214) issued with it, minority statements attached to the majority report, and various remarks on the floor of the House. On 26 April, 1886, Herbert reported the bill limiting public printing and also providing for the restriction of work by the Geological Survey in palaeontology and geological theory. The *Congressional Record* is vital here, because it reveals the previous misinterpretation of Herbert's actions and intentions: "Mr. Speaker, I have been instructed by the commission . . . to submit as a partial report the bill (H.R. 8320) restricting the work and publications of the Geological Survey, and for other purposes. The commission expect soon to make a full and complete report."[98] With the bill, he submitted a report (H.Rpt 1931) that was not printed.

On 5 May, Herbert reported an amended version of H.R. 8320 and a new report (H.Rpt 2214): "I am instructed by the Joint Commis-

[91] *Congressional Record*, 49th Cong., 1st sess., 29 June, 1886, p. 6295.
[92] See *ibid.*, 49th Cong., 2nd sess., 1 February, 1887, pp. 1224–1226.

[93] Herbert's term for himself. See letter from H. Herbert to O.C. Marsh, 13 July, 1886, Papers of Othniel C. Marsh.
[94] Dupree, A.H., *Science*, *op. cit.*, pp. 222, 228–229.
[95] Kevles, D.J., *Physicists*, *op. cit.*, p. 55.
[96] Manning, T.G., *Coast Survey*, *op. cit.*, p. 54.
[97] E.A. Smith, Geological Survey of Alabama, to J.T. Morgan, 10 March, 1886, Morgan Papers.
[98] *Congressional Record*, 49th Cong., 1st sess., 26 April, 1886, p. 3844.

sion . . . to report, as a substitute for the bill H.R. 8320, recently reported, a bill restricting the work and publications of the Geological Survey, and for other purposes. This proposed substitute is accompanied with a written report giving the reasons in favor of the measure. The committee will make a further report in a few days."[99] The amended bill had struck out all sections of the original bill, but substituted only marginally different language in its first three sections. Section four of the bill, prescribing the sale of Geological Survey laboratories and other property that would not be needed under the act, had been deleted entirely; section five, ordering separate appropriations for the printing of the four bureaux, was retained in full.[100]

The next day, Allison called the Senate's attention to Herbert's statement, mentioning "a written report giving reasons in favor of the measure". Allison remarked that the commission did not make the report and that it reflected merely "the individual judgment of single members of the commission, and not the judgment of the commission". Allison mentioned only the report, and not the bill, which Herbert had explicitly claimed was reported from the commission. Morgan, co-signatory of the report in question, spoke after Allison. He defended Herbert from any imputation of intentional misrepresentation, reminding the Senate that "[t]he commission authorized the reporting of a bill, the same, I have no doubt, which has been reported to the other House". Morgan explained that he and Herbert only had agreed on the report. Allison conceded as much: "I did not intend to impute any improper motive to any person connected with the commission, or to any one indeed, but only to make a statement that no report has been authorized by a majority of the commission or by the commission itself, except the report of the bill."[101]

Some scholars have attributed H.R. 8320 to Herbert alone.[102] However, Allison, Morgan and Herbert all concurred that H.R. 8320 had been authorised by the commission. The entire commission—and Allison in particular—shared the authorship and hence any of the credit or blame assigned to Herbert for this bill, because it was through the Appropriations Committee that the language of the bill actually became law.

Allison and Herbert did eventually part. After the report of the amended bill, Powell and other scientists remained unsatisfied. Powell

[99] *Ibid.*, 5 May, 1886, p. 4194.

[100] Manning attributes this change of policy to pressure from Powell. Manning, T.G., *Science and Government*, *op. cit.*, p. 139.

[101] *Congressional Record*, 49th Cong., 1st sess., 6 May, 1886, pp. 4222–4223.

[102] Professor Dupree, in disregard of the *Congressional Record*, describes Herbert's reporting of H.R. 8320 as "his bills" and "[h]is legislation". Professor Kevles also inappropriately attributes H.R. 8320 entirely to Herbert. Professor Manning, even though he has examined the *Record*, also slights Herbert in relating the events, portraying him as acting independently of the commission, calling Allison's correction "tactfully" done, and Morgan's defence a "feeble try." Dupree, A.H., *Science*, *op. cit.*, p. 228; Kevles, D.J. *Physicists*, *op. cit.*, pp. 56–57; Manning, T.G., *Geological Survey*, *op. cit.*, p. 140.

was given a reprieve before a special session of the joint commission on 13 May, 1886.[103] He spent much of his final testimony repeating his defence of the methods and administration of the Geological Survey and implicitly criticising the commission's bill. The special hearing accorded to Powell irked Morgan: "I do not understand that it is becoming the dignity of any committee, after we have agreed upon a report and sent it to both houses or one house and certain of the gentlemen of the committee have expressed their views in writing, to assemble a committee merely to hear what criticisms shall be placed upon that report, and I object to it." Allison had again missed an opportunity to disown the original and the amended bills if they were not of commission parentage. At the end of the hearing, Powell proposed a substitute bill "to regulate the publications of the United States Geological Survey".[104]

Although Herbert and Morgan remained steadfast in their opposition, Powell brought the rest of the commission members around. Herbert reported the change of mind to the House: "There was a great commotion. Office-holders and scientists were agog. . . . Major Powell demanded a rehearing. He obtained it; and lo and behold! when the majority report came out it repudiated the bill that had been unanimously reported." Allison and Lowry reported new bills from the commission that eased the restrictions on the Geological Survey. Allison conceded to Powell the several sections of the original bill restricting the activities of the Geological Survey, but retained the part which was important for the Appropriations Committee, i.e., the final section demanding itemised appropriations for printing.[105]

In order to conclude that Herbert was hostile to science, one would also have to conclude that the substantive work of the scientific bureaux was the issue at hand. This was not the case. Herbert did not intend to destroy federal science, but did intend to demonstrate that even the detailed administration of the scientific bureaux was subject to congressional scrutiny. Herbert consistently and conscientiously praised the science performed by the bureaux. He rarely questioned the quality or utility of the work. What he did question, doggedly, was the authority under the law and the purpose of the work. In response to Powell's testimony that scientific men are "radical democrats" not in need of scrutiny or even loose restraint, Herbert wrote: "Will you permit the director [of the Geological Survey] to say that a scientific man spurns our authority; that you can not limit him by law? Will you sanction by appropriating money in bulk that he may go on without let or hindrance?"[106] As if responding to Herbert's request that scientific men be

[103] *The Geological Survey* [transcript of testimony before a special session of the Joint Commission, 1886], 1. A print of this document is available from Dr Thomas Manning and copies are available from myself.

[104] *Ibid.*, pp. 15, 31.

[105] *Congressional Record*, 49th Cong., 1st sess., 6 May, 1886, p. 6295.

[106] *Ibid.*

shown the authority of Congress, the appropriation for the Geological Survey was not continued in bulk, asserting the principle that the finances of even rapidly developing scientific bureaux should be subject, in the normal manner, to scrutiny by Congress. "This tendency of these creatures of Government to become active legislative forces and to control Congress deserves to be carefully scrutinized, and whenever discovered promptly repressed."[107]

Conclusion

The Allison Commission focused attention on the administration of the scientific bureaux and its relation to the jurisdictional system in the Congress. The commission also had a more considerable influence on congressional policy towards the scientific bureaux than was previously thought. Legislative recommendations offered by the Allison Commission became law, even if they avoided the notice of congressional opponents through the strategic manipulation of the appropriations process. Hilary Herbert was not a crude enemy of science, but a staunch defender of the obligations of Congress to scrutinise the expenditure of funds it allocated.

This detailed political history of the Allison Commission is a necessary part of any history of American science policy. William Boyd Allison and Hilary Herbert were, no less than scientists like Powell, initiators of a tradition which has continued to be important in American governmental science policy.

The form of the special committee devoted to scientific issues was initiated by the Allison Commission. It prefigured more recent and familiar congressional inquiries like the Joint Committee on Atomic Energy, the Government Operations Committee under Representative Fountain, the House Science Policy Task Force, and the Energy and Commerce Committee under Representative Dingell. The attentiveness to details like pay, printing, food and morale—as small but manageable parts of the larger enterprise—foreshadows more contemporary inquiries into the details of the procedures for awarding grants and contracts and the assurances of financial and scientific integrity. The mechanisms of control applied to governmental science by the Allison Commission—particularly itemised appropriations, but also control over personnel through promotions and control of bureaucratic organisation by virtue of congressional rather than disciplinary organisation—stand as early examples of how Congress may continue to exert its constitutional authority to scrutinise an innovative and entrepreneurial scientific community.

[107] Herbert, H., "Restricting the Geological Survey", *op. cit.*

Josef Hlávka, Zdeněk Nejedlý, and the Czech Academy of Sciences and Arts, 1891–1952

STANLEY B. WINTERS

MAY 1891 was an eventful and glorious month in Prague, the capital of the Kingdom of Bohemia. Thousands of visitors from elsewhere in the Habsburg monarchy and from foreign countries joined the citizens of Prague in celebrating a jubilee exhibition depicting progress in Bohemian commerce, industry and crafts that opened on 15 May. From the banks of the Vltava river they rode on the first electric tram in Prague, built by "the Czech Edison" František Křižík, to the site of the exhibition on a plain high above. On 18 May, the magnificent new Museum of the Bohemian Kingdom on Wenceslas Square was dedicated. On the same day, in its grand central hall, the Emperor Franz Josef's Czech Academy for the Sciences, Literature and Arts was inaugurated by its patron, the emperor's brother, the Archduke Charles Louis, with high government officials from Vienna and dignitaries from Prague's civic life looking on. These celebrations took place barely two months after the liberal, nationalistic Young Czech Party had upset the more temperate Old Czech Party in Austria's quinquennial parliamentary elections. Taken together, they constituted a landmark in the "national revival" of the Czech people that had begun a century earlier.[1]

Twenty-seven years later, in October 1918, the Habsburg monarchy collapsed. An independent Czechoslovak republic was one of its successor states. Franz Josef's academy was renamed simply the Czech Academy of Sciences and Arts (Česká akademie věd a umění, ČAVU), but otherwise it remained basically unchanged. In 1952, under communist domination, the Czech Academy was dissolved into a new Czechoslovak Academy of Sciences (Československá akademie věd, ČSAV) that forced its members and staff to conform with the demands of the one-party state. Most recently, in January 1993, with the division of Czechoslovakia into separate sovereign Czech and Slovak republics, the academy was split and reduced in size, with one part becoming the Academy of

[1] The interplay of politics, economics, and culture in the 1880s and 1890s is depicted in Urban, Otto, *Česká společnost 1848–1918* (Prague: Svoboda, 1982), pp. 328–454. On the jubilee exhibition see Kolář, František and Hlavačka, Milan, *Jubilejní výstava 1891* (Prague: Technkom, 1991); Albrecht, Catherine, "Pride in Production: The Jubilee Exhibition of 1891 and Economic Competition between Czechs and Germans in Bohemia", *Austrian History Yearbook*, XXIV (1993), pp. 101–118.