

# SCIENCE.

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*SUPPLEMENT TO No. 115, FRIDAY, APRIL 17, 1885.*

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## *REFORMATION OF SCIENTIFIC LEGISLATION.*

AMONG the propositions floating in men's minds with regard to the re-organization of the scientific and economical works of the federal government are several that can easily be disposed of as impracticable or otherwise objectionable. It will be necessary to enumerate and dispose of a few of these before suggesting any satisfactory solution of this important question.

1. The proposition to put the conduct of the specially scientific work, such as geology, geodesy, meteorology, astronomy, into the hands of the Smithsonian institution. This institution is supported wholly by the income of trust-funds dedicated to a specific purpose by James Smithson, for whom the government accepted the position of executor; and the government cannot legally impose upon this institution any labors or expenses not warranted by the terms of Smithson's will, as interpreted by the highest legal authority in the land. The proper interpretation of the intent of the testator has already been so clearly settled and widely accepted, that it is incredible that now, in the full tide of the prosecution of his desires, the government, as executor, will attempt to divert his funds to other uses. But it will be said, the United States has merely to appropriate additional funds to enable the institution to carry out the proposed increase in its work and responsibility. This seems plausible; and if carried into effect, although it would seem to add these duties to those of the present secretary of the institution, yet it need not necessarily do so: in fact, it is not to be supposed that the United-States government would put the conduct of all its public works into the hands of one man. Probably the authors of this plan had in mind the regents of the Smithsonian institution, and not the secretary, as the body to which the government should assign its scientific work: in other words, to the regents of the Smithsonian should be confided the question of the conduct both of that institution and of all our public works. It is argued in favor of this, that we have

here one institution of a high character, managed by men already organized and recognized, and that the transfer of others to them would be a simple matter. It already has charge of not only the Smithsonian institution proper, but of the national museum, fish-commission, bureau of ethnology, the care of the collections made by geological surveys — and why not of every thing else? But there are many other organizations under government auspices, composed of men who stand ready to undertake great trusts; and who will maintain that the regents have any special qualifications over others? By the law of 1846, the board of regents consists of eight persons chosen from the legislative and executive bodies, and six other persons not members of congress (two of them resident in Washington, and the other four from distant states). Among the twelve persons now constituting the board of regents, we find only one person that can be called a scientific man, — Professor Asa Gray of Cambridge. From the beginning, the policy of the regents has been to appoint a scientific and practical man as secretary, or superintendent, or director of the institution, who is, in fact, simply an autocrat, although legally he is the executive officer of the board of regents. Under this arrangement, various branches of activity have prospered, such as the library, the museum, the departments of exchanges, of publications, of meteorology, mineralogy, anthropology, etc.; and these departments have grown to be large divisions of work. The work of the fish-commission seems never to have been carried on at the expense of the Smithsonian, but was entirely extra work fostered by the regents, in that Professor Baird was allowed to give a portion of his time to it, while the expenses were borne by special appropriations from congress: we may therefore look upon the U. S. fish-commission, which was established by law in 1871, as a scientific and practical institution, fostered by the Smithsonian, but having an independent existence of its own. The policy of the

institution has been little by little to secure an independent existence for each of its varied departments, so that the trust-funds at its disposal could be utilized for new fields of work, — a policy fully justified by the intensely practical value of its labors in the increase and diffusion of knowledge. Thus it happened, that, as soon as the library of congress had an organization and income sufficient to warrant the step, the Smithsonian transferred to its care its large scientific library, and relinquished the idea of maintaining a separate library of its own. Similarly, in 1874, the signal-office weather-bureau having apparently a separate existence of its own, the institution transferred to it its great collection of meteorological data and correspondence, thus relinquishing its own division of work in that department. More recently its system of international exchanges, as also its museum and its mineralogical and anthropological collections, have been recognized as worthy of special encouragement by the government, and have been either made into separate departments, or partially transferred to the geological survey, the national museum, etc.

In a hundred ways the devoted chiefs Henry and Baird have known how to stimulate and cooperate in the increase and diffusion of knowledge. It is now proposed to reverse this process by which separate institutions have grown up as children under the Smithsonian, and have gone out from it when able to stand alone, and to send them all back, with others, to the fostering care of the parent. Evidently, however, some new plan of organization must be adopted before these full-grown institutions can be comfortably housed together. The secretaries, Professors Henry and Baird, have neither of them ever indicated their ability, willingness, or desire to be burdened with the responsibility of so many great organizations; and the regents, composed of statesmen and the executive officers of the government, are not the proper persons to whom to commit these important interests, involving the annual expenditure of from five to twenty million dollars, and in respect to which the expenses of the present administration of the Smithsonian, or the responsibility of its present regents, are quite insignificant. Some satisfactory co-ordination of government work is certainly desirable, — such a co-operation of all departments as has been especially shown by the surgeon-general's office, the signal-office, the navy and the interior departments, in their relations with the Smithsonian. But to put all under the present board of regents of the Smithsonian, who

are merely the advisers of our government as executor of Smithson's will, is not a very dignified proceeding, and is utterly contrary to the provisions and spirit of the federal constitution, according to which the executive power is vested in the president, to whom is allowed a cabinet officer in charge of each of the executive departments; and all disbursements of public moneys must take place through and with the authority of some one of these executive officers.

2. A second proposition has been thrown out by the committee appointed by the president of the National academy of sciences, Prof. O. C. Marsh. This committee, although consisting of members of the academy, does not speak with the authority of that academy as such, as its views were never submitted to, or ratified by, the academy. On the one previous occasion, when congress asked advice of the academy in a matter of legislation concerning the consolidation of surveys, the report of the committee was discussed, amended, and adopted by the academy as a whole, as, indeed, the importance of the subject warranted; and the recommendation of the academy was sufficiently mature to command the respect of all. In the present case this has not been done; and whatever aid or suggestion this present committee has given, is therefore to be credited to them individually, and has not the weight of the authority of the academy as such. The committee, after being shorn of two of its best members, has submitted two distinct propositions, both of which are, they say, 'the general sentiment and wish of men of science,' although they give us no hint as to how they discovered or drew out such expressions of opinion. Both their propositions embody the general feature of the collection of the scientific and other bureaus under one general authority, to be recognized as responsible for and controlling generally the scientific operations of the government. Among the definite forms that might be given to such central authority, they specify two; namely, —

(A) The establishment of a new special department of science as one of the principal branches of the executive department of the government (see article ii. of the federal constitution), to which shall be given the direction and control of all the purely scientific work of the government; and which work should be cultivated, they say, because scientific investigation promotes that general welfare the attainment of which was the object of the constitution.

(B) The transfer of all such work or bureaus as now exist to some one of the present executive

departments, in which department four bureaus should be organized to carry on the four principal classes of work: namely, 1. Geodesy, topography, and hydrography; 2. Geology; 3. Meteorology; 4. Physical standards of weights and measures. In order to assist the secretary in charge of the department to which these works are to be transferred, and under whom the four bureaus are to labor, the committee proposes the formation of a permanent commission, which is not charged with any administrative responsibility, but which shall be attached to the office of the secretary of the selected department, and, under his presidency, shall exercise a general control over the work of the four bureaus, and shall have charge and custody of all the archives, apparatus, and other things appertaining to their work. The commissioners are to receive a salary; and, if any of the four bureau officers spend money contrary to their recommendation, the commission shall notify the proper authorities. In general, the commission is to annually examine, improve, and approve the plans of work and estimates of the four bureaus, but is not charged with purely administrative responsibility: it recommends to the secretary or chief of the department whatever is necessary to the best work of the four bureaus, but has no power to enforce its own recommendations except by remonstrance to the auditor against payment of funds. The commission shall, it is suggested, consist of the secretary, the heads of the four bureaus, six officers of the navy and army, two civilian scientific men, and the representatives of the Smithsonian institution and the national academy, — fifteen in all; viz., one statesman, six military officers, four bureau officials, two scientific men, and two academicians. Presumably it is contemplated that all shall be chosen by the president or the secretary.

This second proposition of the committee of academicians we have given somewhat at length; and, if we have not misunderstood it, there is in the proposed advisory commission a want of strength, and absence of personal responsibility, a liability that science will be in the small minority, — a cumbersome number of persons, such that certainly all of them, or even a majority, will never enter into the merits of the numerous difficult scientific questions that will be laid before them. The consequence will be, that the whole commission will simply approve the recommendations of its own sub-committees, and thus, after all, the conduct of the four bureaus will be entirely in the hands of these bureaus themselves. We can easily grant that the transfer to one department, and the organization of

four bureaus under its secretary, may be a great step towards economy, harmony, and efficiency; but the appointment of an irresponsible commission as advisory to the secretary, who is under more or less obligation to carry out its suggestions, on the one hand gives the fifth wheel to the coach, and on the other hand relieves both the secretary and the superintendents of the four bureaus of all personal responsibility; so that if any thing goes wrong, and congress should appoint a committee of investigation, the report must necessarily be that no one is to blame. This arrangement is inferior to that by which the people hold congress, and congress holds the secretary, while he holds the four bureau officers, to a strict personal responsibility; while each has perfect liberty to call in such advice as he feels in need of.

We have here three propositions. The important general feature of them all is that of consolidation, unification, and systematization of a certain class of government works, either under the Smithsonian, or under a new executive department, or under some existing department. Abstractly such consolidation appears desirable, it certainly pleases the mind of a systematic person; but whether it will result in the greatest good, for the greatest number, is a question that needs consideration, not so much from an idealistic stand-point as from the side of statistics, experience, and history. Can it be shown, from the experience of nations or smaller corporations, that the combination under one department of such diverse matters is really a step in advance? First of all, what are the diverse interests whose welfare we propose to secure? Only a partial exhibit of government work has been given in the act under which the commission is now proceeding, or in the statements that have been made before it, which specify only the signal-service, geological survey, coast and geodetic survey, and the hydrographic office of the navy. The very first act of the commissioners, in their letter to the president of the national academy, is to call attention to the fact that the preparation of their report involves nothing less than an investigation of four important branches of our government, all scientific in their character, and invites attention to the question, "In what way can these four scientific branches be best co-ordinated?" If such co-ordination on this smaller scale ever be accomplished with good results, it will be an argument for the application of the same principles to the remaining scientific, economical, and practical work of the government. It will therefore be well for us here to consider all such work as is now being prose-

cuted under the supervision of committees of federal officers, and of which the following is an approximate list of names that suggest the great variety of intellectual work going on under the government:—

### LEGISLATIVE BRANCH.

#### SENATE.

1. B. — Standing committee on agriculture and forestry.
2. A. — Standing committee on mines and mining.
3. B. — Standing committee on fish and fisheries (fish-commission).
4. D. — Joint committee on the library of congress.
5. B. — Joint committee on public buildings and grounds (botanical gardens).
6. B. — Select committee to investigate the introduction and spread of epidemic diseases.

#### HOUSE.

7. E. — Standing committee of coinage, weights and measures.
8. A. — Standing committee of rivers and harbors.
9. B. — Standing committee of agriculture.
10. B. — Standing committee of railways and canals.
11. A. — Standing committee of mines and mining.
12. A. — Standing committee of public buildings and grounds.
13. A. — Standing committee of levees and improvements of the Mississippi River.
14. D. — Joint committee on the library of congress.
15. A. — Select committee on ventilation and acoustics.

### EXECUTIVE BRANCH.

16. A. — Executive mansion. Commissioner of public buildings, including green-houses and propagating gardens.

#### STATE DEPARTMENT.

17. A. — Bureau of statistics.
18. D. — Bureau of rolls and library.

#### TREASURY DEPARTMENT.

19. Government actuary.
20. A. — Supervising architect's office.

21. C. — Bureau of engraving and printing.
22. B. — Bureau of statistics.
23. A. — Inspector-general of steamboats.
24. A. — Life-saving service.
25. B. — Commission on cattle-diseases.
26. B. — Commissioner of internal revenue.
27. C. — Director of the mint.
28. A. — Lighthouse board.
29. A. — Bureau of weights and measures.
30. A. — U. S. coast-survey.
31. A. — U. S. geodetic survey.
32. B. — Marine-hospital service.

#### WAR DEPARTMENT.

33. U. S. military academy at West Point.

#### *Medical department.*

34. Meteorological division.
35. B. — Medical museum, and medical history of the war.
36. Laboratory.
37. Library and bibliography.

#### *Bureau of engineers.*

38. A. — Mississippi-River commission.
39. A. — River and harbor improvements.
40. A. — Survey of Great Lakes.
41. A. — Survey of U. S. territory.
42. A. — Willett's Point school of engineering.

#### *Public buildings and grounds.*

43. Propagating gardens, aqueducts, Washington monument, etc.

#### *Ordnance bureau.*

44. Arsenals, armories, and ordnance depots.
45. Experiments on material, powder, etc.
46. Artillery school at Fortress Monroe.

#### *Signal-service bureau.*

47. A. — School at Fort Myer for meteorology and signalling.
48. A. — Weather-bureau.

#### NAVY DEPARTMENT.

49. U. S. naval academy at Annapolis.

#### *Bureau of ordnance.*

50. Manufacture of cannon, guns, arsenals, magazines.
51. Newport torpedo station and service.

#### *Bureau of navigation.*

52. A. — Hydrographic office (charts, surveying, meteorology).

- 53. A. — Nautical almanac office.
- 54. A. — Naval observatory and chronometers.
- 55. A. — Compass and magnetic observatory.
- 56. *Bureau of steam engineering.*
- 57. *Bureau of construction and repairs.*
- 58. B. — *Bureau of medicine and surgery.*
- 59. B. — Museum of hygiene.

## POST-OFFICE DEPARTMENT.

- 60. A. — Topographical division.

## INTERIOR DEPARTMENT.

- 61. A. — General land-office.
- 62. C. — Patent-office (deals with all the sciences and their applications).
- 63. D. — Bureau of education.
- 64. Commissioner of railroads.
- 65. Geological and geographical survey.
- 66. D. — Census office.
- 67. Entomological commission.
- 68. National museum.

*Agriculture bureau.*

- 69. B. — Department of statistician and meteorologist.
- 70. B. — Department of entomologist.
- 71. B. — Department of botanist.
- 72. B. — Department of chemist.
- 73. B. — Department of microscopist.
- 74. B. — Department of forester.
- 75. B. — Department of experimental gardener.
- 76. B. — *National board of health.*
- 77. C. — *Civil-service commission.*

*Commissioners for the government of the District of Columbia.*

- 78. B. — Health office.
- 79. A. — Engineer's office.
- 80. A. — Surveyor's office.
- 81. D. — Superintendent of public schools.
- 82. *Smithsonian institution.*
- 83. B. — U. S. fish-commission (report to senate directly).
- 84. B. — Bureau of ethnology.
- 85. D. — National museum.
- 86. D. — Collections of U. S. geological surveys.
- 87. A. — Polaris report.

This list is sufficiently impressive. It is evident, that, in the growth of our nation and government, it has been necessary to undertake many works of general utility to the country, and to attack many questions in the sciences and the arts on which information is needed, either for the benefit of the

legislative and the executive departments directly, or else with a view of distributing accurate information of immediate value broadcast throughout the land, for the benefit of the people at large.

Every thing relating to state relations, — diplomacy, war, law, finance, — it was easily seen in the beginning, must be conducted by the federal government. But matters of public domain — health, internal commerce, post-office, education, agriculture, patents, etc. — also demanded attention; and the departments of the interior, the land-office, and the bureau of agriculture, were provided. These special matters have so increased and subdivided, and have been so promiscuously assigned to various government bureaus, that often it is difficult to see any necessary connection between the nature of the work and the general character of the department under which it is now being conducted. If we were to re-arrange these eighty-seven items according to some approximate estimate of the intrinsic correlation of work, we should probably put the items marked A into one group: these all relate to surveys of land, with attending geodesy, standards of measurement, astronomical, physical, meteorological, oceanic, and geological work, and to such internal improvements as utilize the preceding.

In a second group, B, we should place all that relate to life and growth, health and disease, in the animal and vegetable kingdoms.

We should make a third group, C, of all that relates to manufacture of currency.

In the fourth group, D, we put all relating to the statistics and dissemination of useful knowledge.

This classification is theoretical or philosophical. If, on the other hand, we attempt something merely practical, we will perhaps re-arrange our subjects by simply selecting for the chief of each group that office which has at present the most successful organization, or which, being the largest, could most easily bear the addition of other branches. This would redistribute government work into the following bureaus:—

1. Bureau of surveys (including geodesy, astronomy, economic and military topography, geology, mineralogy, ethnology).
2. Bureau of hydrography and coast defence (including lighthouse and life-saving service).
3. Bureau of standards and adulterations (including physical and chemical laboratories for testing).
4. Bureau of hygiene.
5. Bureau of statistics.
6. Bureau of agriculture.

7. Bureau of mint and money.
8. Bureau of education (including pedagogy, library, museum).
9. Bureau of public works and improvements.
10. Bureau of patent-office.
11. Bureau of climate and weather.

We shall thus have eleven bureaus instead of the present numerous offices, and shall have succeeded in bringing together, in closer relation, a number of branches of public work. We may thus by so much succeed in simplifying the working machinery of the government, and possibly secure a slight economy and improved results; but we are still far from attaining that single scientific bureau, and thereby that recognition of science, which we are told is the general desire in this country, as also in others, and have by no means assured the general harmonious co-operation of these eleven bureaus in so far as that may be necessary. There is, in fact, no one of these bureaus whose operation is not more or less intimately associated with those of some others; and the ideal consolidation, when pushed to the extreme, would require the union of all these in one general department of science, education, and public works, — a slight combination, such as in these eleven offices still leaves unsatisfied the need of a higher general supervision.

Thus far we have only been considering the policy of the executive branch of the government as a business organization for the most economical administration of the laws originating in the legislative branch. If, however, we should consider what policy the legislative branch should adopt for the best welfare of the country, we should undoubtedly decide that it should give the greatest possible stimulus, first, to both the ordinary and the highest education of the people; second, to the execution of national works of public utility (especially taking into its own hands the conduct of any work of general importance, whenever that is neglected by private enterprise, or whenever it is monopolized by a few to the disadvantage of the mass of the people or of the government itself); third, to science and research as the means of developing the resources of nature and of the nation. Acting on these principles, other nations have, on the one hand, made a limited education compulsory, and, on the other, have provided the means for such education; they have demanded the highest attainments and the best work in each department of knowledge, and have provided universities and scientific schools where men can receive the necessary training; they have furnished most accurate topo-

graphic charts in order to facilitate the construction of roads, canals, and other internal improvements; they have displayed the greatest activity in labors relating to the public health, the development of agriculture, manufactures, and commerce, the prediction of storms and weather, protection against spurious coin and measures, adulteration, etc. In fact, most such other nations have exercised a more minute oversight over affairs, individually as well as collectively, than has been considered consistent with the liberty of the citizens in a republican government. It is perhaps not practicable for this nation, as yet, to go so far towards centralization as others have done; and yet we must look to our national legislature for some protection against the evils that arise from disconnected, and often discordant, individual actions. It must stimulate every one's work, and yet secure harmonious action on the part of those who are emulating each other both in public and private life. For instance: we have had, at one time, three or four topographical surveys, six or eight chemical laboratories, four or five meteorological bureaus, all in the government service, often working on the same or allied problems; while in civil life several other institutions can be found going over the same or similar ground. In this emulation and duplication lies the assurance that each will do his work to the best of his ability. The country, and the cause of knowledge, both profit by an occasional duplication of work: the whole progress of science consists in repeating the work of others in the light of newer discoveries or better knowledge, only it is necessary to know when such duplication is needed.

As the first and vital step towards a permanent improvement in the whole round of governmental work, we would not advise the diminution of government officials engaged in the above eighty-seven offices; we would not curtail the scope of the work carried on in each of those offices; we would not re-arrange them under some new classification, since even the best that can be thought of now is stiff, formal, and artificial, cannot foresee the progress of science, and will have to be changed a few years hence: we approve, rather, of the great diversity of work increasing every year, and carried on by the government for the benefit of the nation; the more work and workers, the greater stimulus given to the intellectual and material progress. Let each bureau do its work according to its own needs, whether these be military, ethnological, economic, statistic, topographic, or what not; but let there be somewhere an intelligent supervision of the whole field.

The natural intelligent head of the U. S. government is the legislative branch; and no great gain can result from a re-organization of the executive branch, without a corresponding enlightenment and improvement in the legislative. If any fault exists, or has existed, in the past and present administration of national scientific work, the trouble is not so much with the executive as with the legislative. The laws enacted by the latter, whether they result from suggestions from the country at large, or from the heads of departments, or their subordinates in Washington, are too often imperfect. Some public necessity starts the movement for the formation of a coast-survey, a weather-bureau, a geological survey; but all subsequent legislation is the result of a great deal of management on the part of the few men directly interested, who rarely give the subject the unprejudiced study that is needed in organizing such important concerns. One may know all about forestry or chemistry or statistical methods, may realize their practical importance, and may desire to inaugurate a bureau that shall push either of these subjects to the highest degree of perfection and usefulness; but when it comes to the questions where the bureau shall be placed (whether under military, naval, or civil laws), how the finances shall be administered, with what department it will best affiliate, and how wide its scope of duty shall be, the inaugurators of the new work are necessarily affected strongly by their limited knowledge or personal bias, that needs to be offset by a consultation with others of wider experience. The well-defined systematic statutes organizing the corps and work of the coast-survey (not the geodetic or the topographic survey); the engineer bureau; the Smithsonian institution; the fish-commission and other commissions; the land-office, post-office, patent-office, and other offices, — contrast strongly with the temporary fragmentary legislation referring to the work of the bureau of navigation, with its observatory, almanac, and hydrography, the census-office, geological surveys, signal-office, agricultural bureau, the library of congress, and other important national organizations. In general, it is well known that legislation touching scientific matters comes before congress from committees who have consulted with competent authorities to only a very slight extent; and especially do the more important actions taken by joint committees of conference almost invariably represent, not the wisdom of the wisest, but the will of the strongest, man on the committee. Any thorough solution of our trouble, any radical reform of existing evils, must provide for the infusion of greater

scientific intelligence among our law-makers, and the presence among them of some authoritative board of appeal; so that, before turning over to the president and his cabinet a new item of public work, congress may have fully realized the probable bearings of other works upon it.

In 1863 the act organizing the National academy of sciences was enacted. This created a body of men eminently proper to act as advisers to the government upon any matter of science or its applications; and, as this advice is required by law to be given free of all charge, there have been numerous occasions on which such has been called for and given. Up to the end of 1883, forty-four such reports are enumerated; but we find only two such to have been called for by congress, and none by the judiciary, the rest having been requested by different members of the executive. In this respect we suggest that the legislative branch of government has omitted to derive all the benefit that was desirable from this body of representative scientific men. The president of this academy, in his annual reports, states fully any action taken by the academy each year, at the request of either branch of the government, but with a very delicate spirit offers no advice or comment not called for by the strict letter of the official requests. An act amending the act of 1863, and adding thereto a section requiring the president of the academy to make an annual report to congress on the present state of all national works bearing on science and its applications, with such recommendations as may have the sanction of the whole academy, would give this important body of men an opportunity to speak on behalf of scientific co-workers throughout the country, which opportunity is now offered only through some special request. A further amendment to said act, authorizing the academy at any time to communicate to either house of congress its views on the bearing of any proposed legislation without waiting for special request, would give the country assurance that the scientific, educational, and other interests of the country have at length an official representative who will be on the alert to defend their interests, and to avert injurious legislation. We believe these two amendments would go far towards providing a high tribunal, whose vigilance would insure greater wisdom in legislation; but the following third step is even more important. It is difficult for many outside of Washington to realize that any one who is an employee of the executive branch cannot, without incurring a reprimand, officially or privately approach any legislator with a view to influence legislation:

the law and the custom are quite strict upon this point. Occasionally a bold man will evade or break through diplomatic etiquette; but, as a rule, those members of the academy who happen also to be members of the executive are greatly hampered in any efforts to improve the relations between government and science. We therefore believe, that, before congress can obtain the free, untrammelled judgment of some of the best members of the national academy, it must relieve them individually and collectively from the operation of this objectionable law, and confer upon academicians liberty of speech on matters pertaining to the scientific policy of our national legislature. This great privilege, granted because of their recognized experience and the impossibility of otherwise obtaining the advice of the very men whom congress needs and has accepted as advisers, should be made a duty, and may possibly eventually bring with it a further condition; i.e., the membership of the academy, which is at present wholly a matter of election by its own members, might be in some way ratified by

the senate so that congress may feel that its advisory academy is wholly in sympathy with itself. We conclude, then, by expressing the belief, that without a single abrupt immediate change in the relations of the scientific bureaus and offices of government, without any immediate revolution in the executive departments, without taking from any of the present chiefs his right and liberty to conduct the work committed him to the best of his knowledge and ability, but by three or four simple steps, we may quietly secure for the legislative branch of government such enlightenment and conservative advice as will eventually and rapidly lead to an improved and economical execution of the works now in hand; will insure satisfactory relations between science and the government; will assure the stimulation of scientific education and work, and the strengthening of the hands of such as honestly desire to promote the welfare of the people, rather than the creation of an aristocracy of government officers, or the execution of some petty personal scheme.

X.