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Report of the Alumni M. I. T. Committee on The School.

Jan. 1880.

M. I. T.

Jovings Hotel. Jan 15th 5 p.m.

This report is at least one third if not one half too long. C.S.M.

[Jan. 1880]

make their second annual

Mr. President and Gentlemen,

Your committee report as follows:—

It is our duty and our pleasure in openining our report to allude to the venerable and beloved president of the Institute, whose noble and valuable devotion to the school has been the mainspring of its progress. Our indebtedness to him can never be cancelled, and we can repay him only with admiration and thanks. We must however acknowledge that President Rogers is making a sacrifice of his time and powers, which we ought not to ask from him. Moreover the condition of his health renders it desirable that he should be releived from the burden of responsibility which he now carries. On this account the most important question for the welfare of the Institute is the securing of a permanent president, whose ability and energy shall reëstablish the confidence of the public in the administration of the Institute, and ensure a judicious conduct of its affairs. Various persons have been suggested for this office, and several names have been mentioned ~~to us~~ but as yet no definite conclusion has been reached.

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The selection of the President is of the utmost importance, and it can hardly be hoped that large funds will be subscribed to the Institute until that office is filled by an able successor to President Rogers, because it is generally and justly believed that the future cannot be prosperous until a good permanent president is secured. If Professor Rogers could remain in office nothing better could be wished, nor can we regret too sincerely that it is impossible. [illegible] giving financial details in your report to the Alumni

You may very properly state that, although our debt has been greatly reduced, further contributions from the friends of the Institute are needed to extinguish it; that in virtue of the plan of retrenchment adopted last year the expenses will not again exceed the income; and that

117 Marlborough St.
Boston Jan.y 10. 1880.

Dear Mr Minot.

The Treasurer of the Institute whom I have seen this morning agrees with me in thinking that you Comm: should not enter at giving financial details in your report to the Alumni

You may very properly state that, although our debt has been greatly reduced, further contributions from the friends of the Institute are needed to extinguish it; that in virtue of the plan of retrenchment adopted last year the expenses will not again exceed the income; and that

While, for the present, they compelled to contract the salaries & other expenses of Instruction, the Corporation believe that the Institute will ere long be placed on a more satisfactory financial basis.

Hoping that these memoranda may be useful – I remain with kind regards

Yours faithfully

William B Rogers

P.S. I should have written earlier but I could not find Dr. Cummings until this morning

Ch. Sedgwick Minot Esq.

The whole No. of students varies but little from last year the grand total now being 271 as against 267 last year.

~~income~~. We may now confidently expect a continual growth in the number of scholars. This growth will be of great advantage because the receipts from fees will increase in larger proportion than the expenses.

Small size of present 4th yr Explained -

The small size of the present fourth year is of course due to the fact that the class entered four years ago, or at the time when the effects of the long continued business depression was at its maximum.

This year the Institute publishes for the first time in its annual catalogue a list of the Alumni, giving their names, degrees, addresses and occupations. This list demonstrates the gratifying fact, that nearly every ~~graduate of the school~~ alumnus is in active employment, and a very remarkably large proportion of ~~them~~ graduates successfully prosecuting the professions for which they fitted themselves at the school. This showing proves that the instruction at the Institute accomplishes its object of training superior technologists. In fact it is generally recognized that the Institute School is preeminent among establishments of the kind for its admirable outfit, well planned courses, numerous conveniences, and efficient teachers. Quite as good a technical education may be obtained in Boston as in Europe.

Your committee ~~is convinced~~ suggests that it would be advantageous to prolong the course from four years to five, — two years of general and three for special study. This would alleviate the pressure upon the students, now so great as to be positively unwise. There are complaints, apparently well grounded, that several of the professors, in charge of special technical ~~studies~~ subjects, take more than the share of hours for study alloted to them, thus obliging the students to

Give addit'l elem. studies

curtail the time which should properly be devoted to ~~less imperative~~ studies, less strictly professional. Your committee has heard such complaints against the departments of higher mathematics, of civil engineering, and of Physics. We are confident that the Professors in question do not mean to demand an undue share of work from the students, but that they do so, because they do not correctly estimate the time necessary to learners.

The papyrograph is extensively used, and has proved a valuable adjunct to the instruction in various departments, – notably physics. [illegible] a course in Sanitary Engineering by Mr. E. S. Philbrick.

by persons not members of the regular corps of instructors

Prof. Lanza has had reproduced by the papyrograph from his own notes on applied mechanics some 600 or 700 pages of mss, with a complete set of wh. each student of the course is supplied gratis. Prof Osborne also has used it extensively

The plan is definitely announced in the Catalogue of this year, of having from time to time supplementary lectures, – short courses on special subjects by persons not members of the regular corps of instructors. This winter there is to be such a course in Sanitary Engineering by Mr. E. S. Philbrick.

[Jan. 1880] Prof. Atkinson. 6

~~The Library is located in what was the President's Office~~

The Library, located in what was the President's Office, consists of the collection of the late Prof. Henry D. Rogers (presented to the Institute by Mrs. Rogers), and a small number of miscellaneous books, together with such books ~~as~~ of Prof Atkinson's as are placed there from time to time for the use of students in Literature. Were the shelfs extended, Prof. Atkinson would be glad to place a large number of his books at the service of the Institute.

The room is used by the students as a reading-room and ~~it is at~~ an attendent is always present when it is open.

The distinctly professional books, belonging to the Institute, and the periodicals are distributed among the several departments.

The cataloguing of the Rogers library and of the other books and periodicals has been ~~separ~~ done for each separately, and the collation of the whole is promised at an early date.

A recently inaugurated system of acknowledging accessions from government, and other donations, promises to increase the number of books and maps thus received. But there is not room at present to display what is already on hand.

The acquisition of back numbers of standard scientific serial publications (such as transactions of learned societies) is very desirable, in order that students may be accustomed to refer to original sources of information.

This completes the general part of our report. We pass now to those general studies, which are followed by all the students or at least enter into a majority of the courses.

In the mathematical instruction the changes have been comparatively few. A discrimination has arisen between the pure mathematics and certain applications which used to be associated with them. Stereotomy however is ~~still~~ taught by the professor of mathematics, as a sequel to Descriptive Geometry.

The course covers the first two years and extends about two months into the third. The aggregate time given has not been materially changed; but it is now ~~concluded~~ completed ~~ed~~ earlier in the course than it was several years ago.

An attempt to raise the standard of admission by requiring Solid and Spherical Geometry has been abandoned. The requirements of colleges are found to have an influence upon preparatory schools, which the Institute cannot effectively disregard.

~~Among the matters which are excluded out may be mentioned~~

Analytic Geometry of Three Dimensions is excluded out of the course, together with several ~~many~~ useful ~~considerations~~ methods ~~developments~~ in ~~the~~ Two Dimensions. As the department is ready to give the instruction, it seems a pity that the students should have to lose the important discipline derivable from considerations "in Space".

In the Integral Calculus especial attention is paid to those integrals which are important to the course in Applied Mechanics.

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As an example of special instruction, may be mentioned a course on Differential Equations, given last year to the student in Physics.

The policy has been to use text books which are fuller than the course given, so that the contents of the omitted chapters shall be more accessible to the student than they would be in a book which he had not used.

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Prof. Gaetano Lanza – 3rd Year.

The Applied Mechanics has been developed into a distinct course by the professor now in charge. It directly follows the pure mathematics, ~~and grounds the~~ for students ~~of~~ the various branches of Engineering, and also of Architecture and Physics; and it grounds them in ~~many~~ mathematical applications which would otherwise ~~cause delay~~ necessitate digressions in their professional studies. As the Strength of Materials, the Theory of Domes ~~and~~ Bridges and Roofs, the Arches, Dynamics of Machines, and the Flow of Water are given in this course, it would seem at first sight to enter the ground of the professional courses; but, on the other hand, this preparation upon the mathematics of the subject leaves the engineering departments free to enter more thoroughly upon ~~the~~ practical details.

The ~~students~~ classes are much subdivided for the study of Mechanics, ~~since~~ from the varying nature of the professional courses for which it fits them.

There is but slight adherence to any one text-book.

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Prof. C. R. Cross
Messrs. Holman
and Hauck Jr.

Physics 10

Will bring
the Mech. & Eng.
to Prompt.

~~to original sources of information~~

The department of Physics covers three fields of work, the lectures, the general laboratory practice by which the student is familiarized with the laws he is studying, and the more extended instruction of students in Physics and other persons

Of the lectures little need be said. The course is well systematized and faithfully conducted, and apparatus for illustration is ~~fairly~~ ample for the purpose. Besides what is owned by the Institute of Technology, and what is loaned by the Lowell Institute, the apparatus of Mr. Ross renders efficient service. In Sound the means of illustration are especially complete. The course of lectures, formerly completed in the second year, now extends to Thanksgiving time in the third.

The laboratory is a source of just pride to the Institute. Suggested by Pres. Rogers before the Institute itself was fairly established, and brought into existence by Prof. Pickering, it is the pioneer of such laboratories in this country, and it has been widely copied. And under the professor now in charge, with his assistants, it has maintained a steady improvement, and has kept in the van.

Familiarity with laboratory work is gained in experimenting in the Mechanics of Solids and the methods of Measurement in general, the most refined measurements being avoided at first. The apparatus for this is compara-

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tively simple, and is adequate for the purpose.

The Mechanics of Liquids is next given. The laboratory is, naturally enough, ill adapted to experiments in Hydraulics, which indeed pertain rather to Engineering than to Physics, and according time is given them but little.

The Mechanics of Gases follows; but some careful work with Gases is omitted here, because there are better facilities in the chemical laboratories.

Sound offers a comparatively small field for general laboratory practice, and most of the experiments, moreover, would not be conducive to quiet in the laboratory.

Light is carefully studied. The students are now accustomed to more precise measurement and to greater care in the use of instruments. The equipment meets these increased requirements.

The apparatus in Heat has been more recently acquired, and the course may be said to be still undergoing development.

Finally comes a set of exercises in Electrical Measurement. The equipment for this is sufficient for what is given, but many quantitative operations in Electricity would be too refined in apparatus and method for general students, even were the instruments at hand.

What has been said of the sufficiency of the apparatus for the various subjects refers to its use in obtaining a knowledge of Physics, rather than to the acquirement of special skill in experimenting.

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In spite of the effective working of the laboratory as Prof. Pickering left it, several improvements have been made.

Having two assistants in the laboratory has enabled greater care to be taken in arranging the apparatus beforehand, so all the students time can be devoted to the experiment in hand. By assigning the experiments more invariably in advance, the student has a chance to prepare himself for the exercise. The experiments are so arranged, in groups for assignment, that each student shall have certain important ones, while he shall not have a number of very similar ones. It is found impossible, however, that each student in a class shall have the experiments assigned in the best order for him individually. A record of the work of each student is kept, independent of his own notes. The student can obtain papyrograph notes of all the experiments, whether they be assigned him or not. The standard of precision ~~to~~ which the students attain has been raised; but in striving for better results the instructors feel the need of more instruments of precision, ~~and this~~ This we are inclined to emphasize as the great want of the laboratory at present.

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Beside the general course in Physics given to all regular students, the laboratory ~~offers facilities~~ affords a means of training students in a thorough course of Physics. Students in Civil Engineering come here to experiment upon the strength and rigidity of miniature ~~bridges and roofs~~ structures of their own ~~construction~~ make, — students in Chemistry for experience with batteries and electrolysis, and elective students for special researches.

Your committee is not prepared to report this year upon the laboratory in its relation to original physical research, and want of space forbids mentioning at this time the various delicate and expensive instruments with which the Laboratory is prepared to offer facilities for careful investigation, of which it stands in need for this purpose. But we would suggest that the time is approaching when the ~~resources~~ opportunities for research possessed by Boston and its vicinity will be considered as a unit; and that the Institute should prepare itself without delay to take a ~~leading~~ important place among the institutions which afford the desired means, without unavoidable duplication ~~of work~~ between them. With the Johns Hopkins University in Baltimore ~~before~~ us as an example, we cannot afford to let our efficiency be impaired by want of co-operation between rivalries ~~upon~~ opposite sides of the Charles. ~~impair our efficiency.~~

The Prof. of Physics gives the instruction in Descriptive Astronomy

[Jan. 1880]

In the department of Chemistry, general qualitative, quantitative, organic and industrial the Institute gives very efficient and thorough instruction. The chemical laboratories are however cramped for room, and unsuitably placed. We must look forward to the time, when a new building can be erected, designed especially to contain the chemical and mining laboratories, and the furnaces. Not only are more convenient accommodations sorely needed, but the danger from fire would also be sensibly lessened. The present weighing room is a dark closet which can be used ~~even~~ at no time except by gas-light. The department of ~~qualit~~ quantitative analysis is very perfectly arranged, and it has been asserted, probably with truth that nowhere abroad is there a laboratory with a better outfit for class instruction, though there are some better equipped for the pursuit of special investigations.

The following text books are in use:—

Nichols Edition of Eliot and Storer's Manual—

Qual.

Fresenius—

Organic

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Free Hand Drawing.

This department fills much the same place in the courses that it has formerly done. The Institute is well supplied with models for line drawings, shades shadows & perspective, isometric & other projections, besides the more ornamental free hand drawing & shading, sketching &c of the Architectural Dept. For the more advanced work of the Free Hand Dept, models are borrowed from the Museum of Fine Arts nearby, whenever desirable, and the students have ~~thus~~ access to models for the final work. The Institute has also acquired by purchase & otherwise, largely from the Centennial Exhibition at Philadelphia, many fine pieces of ornamental work, models &c which can be made use of in this Dept.

The department of English has, since the departure of Prof. Hovison devolved entirely upon ~~the hands~~ Prof. Atkinson, who is certainly overcharged with work, although he has two young ladies, ~~to~~ assist him in reading and correcting the theses. These ladies ~~in return~~ are pupils of the Institute and receive their remuneration in the form of gratuitous tuition. This department is at present the only one in which there is but a single professor and no regular assistant. It is to be hoped that Prof Atkinson will be provided with a permanent adjunct as soon as the condition of the Institute shall render it practicable. The ~~instr~~ plan of instruction in English ~~is very meritorious, and is~~ would without question ~~calculated to~~ be of great advantage to the students, if it were systematically followed. But no matter is pursued with regularity, and the students feel a ~~much~~ less interest in this department than in any other, for they are accustomed to follow systematic studies under all their other instructors, and therefore feel the more acutely the imperfections of their ~~English stu course~~ course in English. ¶ We ~~mak~~ have no report to make upon the studies in modern languages.

This completes the report upon the general studies. We shall now turn to the special professional subjects

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The department of mining and metallurgy is in many respects the most important, not only intrinsically but also because its outfit is so excellent. There can hardly be any question as to the advantage of the method of teaching pursued at the Institute. The laboratories are well supplied with various kinds of furnaces and mining machines - you are all doubtless familiar with these appliances. There is no other ~~school~~ polytechnic school in the country which is supplied with so valuable and varied a stock of apparatus of the kind as the Institute, which is the only place where mining engineers can acquire practical familiarity with furnace and mill work. No important changes have occurred recently, therefore it seems unnecessary to report at greater length upon these departments.

The instruction in blow-pipe analysis is chosen to show the thouroughness ~~and sat~~ of the instruction and the satisfactory condition of the department, which is everywhere pervaded by the same systematic efficiency. The room used for the blow pipe and mineralogy, is small and poorly lighted, but conveniently fitted up. Around the walls are cases containing excellent collections. In a locked and covered case are bottles containing fragments, ready for the students use, of about four-

hundred species of minerals. An ingeniously arranged record of each student's work is kept, by means of which it can be seen in a moment exactly what minerals he has had and in what order. By this device the instructor is enabled to avoid giving to any student a mineral to analyse, ~~which shall virtually lead him~~ similar or identical with what he has already had. By the handling of larger specimens, the students are made familiar with the appearance of the principal minerals, while by the use of models of crystals they are taught the laws of crystallography, and by the examination of natural crystals they learn the application of crystallography to the determination of specimens. Each student is supplied at a cost of $2.50 with a set of blow pipe instruments, which he keeps, permanently ~~at the end of year~~ returning ~~at th~~ to the Institute at the end of the year only the agate pestle and mortar. The students therefore make a valuable purchase at small outlay. In the laboratory each student has a separate work table, and lamp. The lectures take up the classification and general laws of mineralogy. We do not see how any any essential improvement of this course in mineralogy is possible. It fairly exemplifies the excellent and pains-taking instruction in the whole

$1.50 / 2

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department.

The lectures which come under the general head of Natural History are Zoology and Palaeontology, Physiography, Lithology and Geology, These subjects are now all so arranged as to be essentially part of the mining course, being intended to lay the foundations of a knowledge of practical mining geology. The lithology, which is taught by Mr. Crosby is intended to lead also to the subject of build.g materials. No important changes have occurred, nor can we report any that are feasable. The Biology is virtually a short botanical course, the appropriateness of which is not quite apparent.

The instruction in Physiology

Prof. Charming Whitaker

Mech. Eng.

[Jan. 1880]

Comparing the condition of the professional departments with what they were ten years ago, the Mechanical Engineering is found among those which have made the greatest advances; and yet perhaps ~~in~~ no department will ~~more extensive changes have~~ still to be made, ~~in order~~ before ~~it can be modifications~~ have to undergo more modifications of plan, before it can be regarded as on a permanent footing. For this reason the details of the present system will not be reported upon.

Every department has to be gradually developed, and it is not unnatural that ~~that of Mechanical Engineering~~ this one should have remained unsettled during the development of the ~~Appl~~ course in Applied Mechanics. The course in Mechanical Engineering is ~~also~~ quite dependent upon a laboratory fitted with large, and therefore expensive, apparatus. The present ~~equipment is largely~~ mainly due to the zeal of the professor in charge, but it has been acquired by giving an undue amount of the time of former classes to special researches, to the hindrance of a well balanced arrangement. But the financial condition of the Institute made it necessary to make these concessions to the interests of the gentleman (Mr. Geo. B. Dixwell) who so liberally furnished the apparatus — ~~Mr. Dixwell~~. The course has

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also suffered from the fact that the Institute could not command the ~~whole of the professor's~~ undivided energy of the professor. This defect has been remedied. The practically unsolved problem at present is the arrangement of the course in such a manner that none of its requirements shall anticipate the preparation of the students given in other courses, while nothing given under mechanical Engineering shall duplicate what properly belongs elsewhere.

~~It shall not duplicate the instruction, or work in other~~

Your committee would express a hope that the present laboratory of Steam Engineering will prove to be the germ of a more general Engineering Laboratory. When the room and the means shall have been obtained, — we know not just how — a pump should be provided, driven by the engine against an artificial resistance, measurable, and variable at will. Between the engine and the pump we should be able to interpose various kinds of machinery of transmission, or a transmission dynamometer. The valve chambers of the pump should be ~~arranged~~ planned to receive various forms of valve, so arranged that the lift may be quantitatively observed; and the water should be capable of traveling the length of the building and back, in canals and pipes placed below the level of the basement floors. The present friction brake should be converted into a Prony brake, ~~(which~~ for measurement a change which it seems could be carried out without delay.) With such apparatus we could measure the power of the engine, ~~power~~ by indicator, by friction brake, by transmission dynamometer, and by water resistance, and ~~could~~ estimate the resistance of machinery ~~by~~ of transmission by comparing the results; we could study the action of pumps; and we could measure the resistance of flowing water on a by no means contemptible scale.

The Department of Civil Engineering.

This dep't has been extended in the last few years, so as to be somewhat more complete than formerly, and it is believed is much better ~~managed~~ arranged. The students of the 3d & 4th years devote more time to their professional studies than formerly, owing to their having finished many non-professional ~~studies~~ subjects before entering the 4th year, and to a less extent, the 3d year also. The latter half of the 4th year is almost entirely devoted to Thesis work. The instruction in Mechanics is now given by Prof. Lanza, with much more completeness than ~~it~~ was formerly possible, and in the Strength and Stability of Materials & Structures, something approaching the ideal course in Engineering is attained. Many practical examples are used which not only test the students comprehension of the subjects taught, but teach ~~them~~ pupils at the same time, how the principles themselves are applied to actual work. For example:- As soon as the general principles of the load and strains on simple beams &c. ~~were~~ are acquired, the students ~~were~~ are given a common triangular or trapezoidal truss, loaded in specified ways, to determine the stresses in every member. As the lectures progress~~ed~~, more & more complicated forms of trusses ~~were~~ are chosen and the ~~strains~~ stresses determined. The present 4th years class, having gone as far as the "arched rib," are to work out ~~the~~ stresses in the arches of the Boston & Providence R. R. passenger station, ~~Mr~~ with Prof. Henck at about the same time

they study the common forms of bridge & roof trusses of which they have had typical forms, and thus acquire a ~~practical~~ familiarity with modern practice which gives them far greater confidence in themselves, and far more ability ~~afterwards~~ than students of 5 or 10 years ago could have probably acquired.

(See note on back of leaf)

For the Field Work of this dept it is supplied with 7 seven transits, some of which are of good construction, & some incapable of fine work; there are also 2 two levels, sufficiently good for any requirements of the Institute. The measuring tapes are not quite what could be desired, but are perhaps more durable in the hands of inexperienced students than finer ones would be. An altitude & azimuth instrument of somewhat old design, but apparently of good construction is used for the astronomical & geodetic work.

The Civil Engineering Drawing Room is furnished with a book case in which is kept a small library of elementary professional works to which the students have access. ~~Bound volumes of the principal objects admitted to Engineering exhibitions~~ Accompanying and very convenient study room opens out of the drawing-room which must be of great value to the students. In cases on the walls of the drawing-room are hung large photographs of some of the best bridges that have been built, many of them during process of construction, as well as when finished. There are examples of the Keystone, Frick, Post, Phoenixville & other companies, and many English, French & German examples. It is of interest to mention in this connection quite a collection of American bridge & roof photographs.

Note to preceding page.

Each student in Prof. Lanza's course is also supplied gratis with some 600 or 700 pages of manuscript notes on Applied Mechanics which Prof. Lanza has kindly reproduced by the papyrograph. from his own notes on the subject.

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designed and contributed by C. A. Smith, a graduate of the Institute in the class of 1868.

A large set of charts, ~~some~~ nearly 100 in number, published in Germany, showing all the details of construction of bridges, ~~dams~~ roofs, turntables, draw-bridges, dams, canals, breakwaters, foundations, masonry, arches, &c &c, are in a cosy drawers in one end of the room, where were also found in promiscuous confusion several sets of lighthouse plans & coast charts, sheets of soundings & plans of harbors, maps of cities & towns near Boston, and of cities & harbors in Great Britain & on the continent, plans of several Railroad surveys in Massachusetts & elsewhere, &c, &c. It would appear that a more systematic arrangement of these accessories to the Dept would greatly enhance ~~its~~ their value.

There are valuable reference books belonging to the library, so that the student scarcely need go out of the drawing room ~~to refer to himself~~ for information on almost any subject of his professional study.

Among the periodicals regularly taken by the Dept may be mentioned

"Engineering" (London, Mann & Dredge)

"Annales des Ponts et Chaussees"

"Memoires des Société Ingenieurs Civil"

"Van Nostrands Engineering Magazine"

"Transactions of the American Society of Civil Engineers."

These last have been regularly received since 1872, but have been filed away without ~~reading~~ inspection in the Secretary's office, and it is only very recently ~~lately~~ that they were discovered. It is

scarcely open to question whether ~~the~~ a department ~~or a Professor~~ a Professor or which has till ~~very recently~~ now, made no use at all of the most modern developments of the subjects he teaches, does not need the revision it has begun to receive.

That a department, in which the Professor has till now made no use at all of the most modern ~~improvement~~ developments of the subjects he teaches, needs the revision, it has begun to receive.

The Department of Architecture.

This Dept is excellently well supplied with that which will be useful to the student in the way of casts, models, photographs, & drawings. Few ~~were~~ if any such useful and serviceable Architectural libraries exist anywhere in this country, and it is superior in some respects to those abroad, principally because of the little restriction placed upon its use by the students of the Dept, in marked contrast to the schools abroad. Gentlemen who have studied Architecture both at the Institute & in the best schools of Europe, say they are able to derive more benefit from the books &c, at the Institute than from the magnificent libraries abroad. For instance; in ~~the~~ "L'ecole des Beaux-Arts" of Paris the students are not allowed to trace from the books, and can only see some of them ~~who~~ in charge of an attendant. There is more material at the Institute than can possibly be made use of in a four years course as at present arranged, consisting in part of excellent sets of photographs of details of all kinds, full size drawings of Architectural orders, also of details, mouldings, cornices, ornaments,

&c. ~~full size~~ ~~&c.~~ with the dimensions marked on them. There is also a large collection of photographs and a nice set of stereoscopic views on glass; many drawings (largely the work of former students,) some loose and some bound up in books. Among the drawings may be mentioned a fine set executed in ~~the~~ Paris by Mr. Letang the present assistant to Prof. Ware, ~~and~~ ~~wh~~ There are also plaster models & casts, including ornamentations & scroll work in relief &c. Such as are wanted, which the Institute does not possess, are borrowed from the Art Museum near by.

With an increase of funds, no doubt the Architectural Dept may be expected to become even better than at present, but it may justly be said to be excellently equipped, and leaves little to be desired except a better fitting of its students when they enter upon the course. An Architectural Assoc'n exists among the students of that Dept, which meets every week for sketching practice &c. [A prize is given each year by the Boston Soc. of Arch'ts ----

Models, Photographs, Casts, Drawings &c

No attempt is made to furnish a catalogue of the apparatus of the Institute in this direction, but mention may be made of some things especially useful or valuable.

(1) An excellent set of models for the study of Descriptive Geometry, and their projections on each plane. In this connection it may be mentioned that Prof. Watson designed & lithographed a set of stereoscopic views of the different problems, which with the aid of that instrument show the actual relations of ~~cut-ting planes &~~ solids ~~&c~~ cutting planes &c.

(2) A set of models from the Centennial Exposition at Phila. of all forms of wood-turning practice and of carpentry joints, over 60 in all.

(3) About 100 ~~pieces~~ sections of all common forms of rolled iron beams, & girders, and consisting of I shaped, T shaped, channel & angle-iron sections of from ~~¾~~" 2" ± to 16" deep. These all have the name of the company and the weight per yard ~~marked~~ stamped on them. [See note on back of leaf.]

(4) A fine set of parts, pests chucks &c. for an Engine lathe

over —

Note. The students in Architecture + ~~Design~~ Engineering, in working out the details of bridge designs, roof trusses &c in iron, are thus able to select such forms + sizes as could readily be ~~for~~ obtained in the market.

(5) Models of the different forms of drills reamers and other cutting tools &c used in boring metal, also a set of models of files. These all are in wood and of very large size.

(6) A very large collection (already catalogued in the Presidents report for) of seeds, specimens &c from nearly all countries of the globe. These are arranged mostly in bottles in glass cases on the upper floors of the building, and so far as could be ascertained, no use whatever is made of them.

(7) A very fine set of wooden miniature models of iron girder bridges, made in Germany, and which show every member, bolt + rivet of the bridge. These have scarcely ever been made use of, and are in some instances falling to pieces for want of proper care.

The "Russian" School Shops.

Your Committee were shown through this ~~section~~ ~~dept~~ dept but at a time when no work was actually in progress, the students having departed for the day. There are places for 16 students in each ~~dept~~ section except in the forge shop, where only 8 at a time are at the anvils, the remaining 8 acting as assistants (?) & taking their turn in due time. The wood working section contains benches fitted with vise, and with saws, hammers, chisels, planes &c which the student keeps in a locked closet, with the pieces of work he may have in progress. He is taught to ~~put~~ keep his own tools in order, and to make & put together, and finish up different forms of joints, frame &c & cabinet work &c. There are also 16 speed lathes for wood turning.

The metal ~~dep~~ working sections consist of a foundry & moulding room, where the students mould their patterns & then cast them in iron, a forge shop where they are taught the use of the hammer and anvil, and are instructed in all sorts of welding, drawing, upsetting, &c. Your Committee were shown some fine & very ingenious specimens of forging done by the

students of this section.

In the vise shop they are taught chipping & filing, the fitting of joints & pieces of machinery &c.

The turning shop is fitted with 16 Engine lathes of fine construction, and here as in the other sections, the aim is to give the student as large a variety of examples as possible so that he shall be familiar with the principles to be applied in the new cases which may arise. These shops are believed to be a valuable adjunct to the Instruction of the Institute though by no means turning out skilled mechanicians after a few weeks spent at each of half-a-dozen things. Along with their practical work the students in this Dept have some theoretical instruction.

[Jan. 1880]

Before closing our report we wish to recommend for your careful consideration a proposition of importance. Hitherto the Alumni as a body have testified their interest in the welfare of the Institute rather scantily. We claim the privilege of receiving a report of the condition of the Institute - but we have done nothing to earn that privilege - We therefore request you to discuss the desirability of forming a fund to be held by a responsible trustee, for the benefit of the Institute -

them.

It seems to us desirable that the Assoc. should purchase a blank book in which these reports on the school can be permanently recorded. The last report as well as the present exists only in the form of an unseemly MSS., and the former report is not ~~on~~ file. If such a book be purchased and used, the reports will be always accessible to any members of the association who may wish to consult them.

Finally we recommend making these reports biennial instead of annual. If you adopt that recommendation, we would suggest the desirability of lengthening the term of membership of this committee from three to four years one member to retire every second year. ~~If this~~ is not so arranged it will regularly happen that one member will be engaged upon a single report only.

Your com^tee earnestly hope that some discussion will follow of the criticisms and suggestions which this report contains.

C. S. Minot
G. K. Edmands.
Geo. W. Blodgett.