Throop Institute Bulletin

NUMBER FORTY

Supplementary Catalogue Number

INCLUDING

The President's Installation Address
Condensed Statement of the Curriculum
and Miscellaneous Information

DECEMBER, 1908

PUBLISHED QUARTERLY BY
THROOP POLYTECHNIC INSTITUTE
PASADENA, CALIFORNIA

Entered May 22, 1905, at Pasadena, California, as second-class matter under Act of Congress of July 16, 1894

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INSTALLED NOVEMBER 19TH. 1908

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The Charter

Amended Articles of Incorporation of Throop Polytechnic Institute

(Formerly Throop University.)

Know all men by these presents, that we the undersigned, all of whom are residents and citizens of the State of California, have this day voluntarily associated ourselves together for the purpose of forming a Corporation under the laws of the State of California.

And we hereby certify, FIRST—that the name of said corporation shall be Throop Polytechnic Institute.

SECOND—That the purpose for which it is organized is to establish, maintain and operate an institution of learning embracing the different departments, or colleges, of higher education, including those of the various professions; and to provide for all who may wish an inexpensive, but liberal, thorough and practical education.

THIRD—That the place where the institution is to be conducted is Pasadena, California.

FOURTH—That the number of its Trustees shall be fifteen, and the names and residences of the first Board of Trustees are as follows:

A. G. Throop, Pasadena, Cal.; P. M. Green, Pasadena, Cal.; J. W. Scoville, Pasadena, Cal.; E. L. Conger, Pasadena, Cal.; Enoch Knight, Los Angeles, Cal.; W. L. Hardison, Santa Paula, Cal.; C. H. Keyes, Riverside, Cal.; James H. Tuttle, Minneapolis, Minn.; Jeanne C. Carr, Pasadena, Cal.; Louise T. W. Conger, Pasadena, Cal.; J. D. Yocum, Pasadena, Cal.; E. E. Spalding, Pasadena, Cal.; W. E. Arthur, Pasadena, Cal.; Charles F. Holder, Pasadena, Cal.; George H. Deere, Pasadena, Cal.

The Board of Trustees shall, as soon as organized, so classify themselves that three of their number shall go out of office every year, but thereafter the Trustees shall hold office for five years.

A majority of said Board shall not belong to any one religious denomination or sect, and the institution shall be maintained and administered as an undenominational and non-sectarian school.

FIFTH—The name of the only person who has yet subscribed money or property to assist in founding said University, is A. G. Throop, who has subscribed the amount of Two Hundred Thousand Dollars.

H. H. Markham, H. W. Magee, J. C. Michener, W. U. Masters, J. S. Dodge, Geo. H. Bonebrake, Delos Arnold, Lionel A. Sheldon, T. P. Lukens, E. F. Hurlbut, T. S. C. Lowe, P. M. Green, F. C. Howes, Milton D. Painter, A. G. Throop,

In witness whereof, we have hereunto set our hands this 12th day of September, one thousand eight hundred and ninety-one.

STATE OF CALIFORNIA, } ss.
COUNTY OF LOS ANGELES, }

On this seventeenth day of September in the year one thousand eight hundred and ninety-one, before me, E. T. Howe, a Notary Public in and for said County of Los Angeles, personally appeared

H. H. Markham, H. W. Magee, J. C. Michener, W. U. Masters, J. S. Hodge, Geo. D. Bonebrake, Delos Arnold, Lionel A. Sheldon, T. P. Lukens, E. F. Hurlbut, T. S. C. Lowe, P. M. Green, F. C. Howes, Milton D. Painter, A. G. Throop,

Known to me to be the persons whose names are subscribed to the within and annexed instrument, and acknowledged to me that they executed the same.

In witness whereof, I have hereunto set my hand and affixed my official seal, at my office, in the City of Pasadena, County of Los Angeles, the day and year above written.

E. T. HOWE,

Notary Public in and for Los Angeles County, Calif.

(Seal)

STATE OF CALIFORNIA, } ss.
COUNTY OF LOS ANGELES, }

We, Norman Bridge, President, and David Heap, Secretary of the Board of Trustees of Throop Polytechnic Institute (formerly Throop University) do hereby certify that the foregoing is a full, true and correct copy of Articles of Incorporation of Throop Polytechnic Institute as the said Articles are now amended; that the same were duly amended by a majority vote of the Board of Trustees of said Corporation, with the written consent of two-thirds of the incorporators and in accordance with directions contained in the last will and codicil of Amos G. Throop, deceased.

In witness whereof, we have set our hands and affixed the seal of the said Corporation this twenty-ninth day of July, 1897.

(Signed) NORMAN BRIDGE, President,
DAVID HEAP,
Secretary of the Board of Trustees of Throop Polytechnic Institute.

Board of Trustees

(Arranged in the order of seniority of service)

		Term Expires
EVERETT L. CONGER, D. D.	Pasadena	1912
NORMAN BRIDGE, A. M., M. D.	Pasadena	1909
CHARLES D. DAGGETT	Pasadena	1911
MRS. CLARA B. BURDETTE	Pasadena	1910
HIRAM W. WADSWORTH, A. B.	Pasadena	1911
JAMES H. M'BRIDE, M. D.	Pasadena	1910
S. HAZARD HALSTED	Pasadena	1912
ARTHUR H. FLEMING	Pasadena	1909
MICHAEL CUDAHY	Pasadena	1911
C. J. WILLETT, A. M.	Pasadena	1911
GEO. E. HALE, SC. D., LL. D.	Pasadena	1911
C. W. GATES	Pasadena	1912
J. A. CULBERTSON	Pasadena	1911
HENRY M. ROBINSON	Pasadena	1910
W. H. VEDDER	Pasadena	1909

Officers of the Board

NORMAN BRIDGE, President
C. D. DAGGETT, Vice-President
W. H. VEDDER, Treasurer and Auditor
THEODORE COLEMAN, Secretary and Business Agent
Residence, 149 South Madison Avenue
GRACE B. WRIGHT, Assistant Secretary
Residence, 306 Pleasant Street
C. J. WILLETT, Esq., Attorney

Executive Committee of the Board

NORMAN BRIDGE, Chairman ex-officio
C. D. DAGGETT — C. W. GATES
A. H. FLEMING — C. J. WILLETT

Founder

HON. AMOS G. THROOP
Born at De Ruyter, New York, July 22, 1811. Died at Pasadena, California, March 22, 1894.

The Faculty

JAMES A. B. SCHERER, President

A. B. and A. M., Roanoke College; Ph. D., Pennsylvania College (English Literature); LL. D., University of South Carolina. Teaching experience, 15 years.

500 Del Rosa Drive

ARTHUR HENRY CHAMBERLAIN, Dean

B. S. and A. M., Columbia University; Higher Diploma, Teachers' College; Graduate work with Leipzig University. Teaching experience, 16 years.

377 N. Los Robles Ave.

BENJAMIN FRANKLIN STACEY, Junior Dean

Professor of History and Economics; Librarian

A. B. and B. D., Lombard College; A. M., University of Arizona; Graduate work with the University of Chicago. Teaching experience, 7 years.

274 N. Raymond Ave.

WALLACE KENDALL GAYLORD, Registrar

Professor of Chemistry

B. S., Massachusetts Institute of Technology; Graduate work with the University of California. Teaching experience, 15 years.

75 N. Hudson Ave.

MRS. JENNIE COLEMAN, House Matron

Instructor in English

Life Diploma, California High Schools. Teaching experience, 31 years.

149 S. Madison Ave.

LUCIAN HOWARD GILMORE

Inspector of Equipment; Professor of Physics and Electrical Engineering

A. B., Leland Stanford, Jr. University; Graduate work with the University of Chicago. Teaching experience 13 years.

649 Galena Ave.

HERBERT BOARDMAN PERKINS

John Wadsworth Professor of Mathematics

B. S., Massachusetts Institute of Technology; Graduate work with Munich and Geneva Universities, and the University of California. Teaching experience, 28 years.

45 S. Fair Oaks Ave.

ROBERT EDGAR FORD

Professor of Mechanical Engineering
and Director of Manual Training

B. E. E., and E. E., University of Minesota; Graduate work with the same. Teaching experience, 11 years.

137 S. Madison Ave.

CARL SPENCER MILLIKEN

Professor of Biology

B. S., Massachusetts Institute of Technology. Teaching experience, 9 years.

Altadena

ARTHUR BLEDSOE COOKE

Professor of German and French

A. B. and Ph. D., University of Virginia; Graduate work with the Universities of Gottingen and Berlin. Teaching experience, 13 years.

Begins Jan. 1, 1909

ERNEST ALLEN BATCHELDER

Director of Arts

Diploma, Massachusetts Normal Art School; Graduate work in Europe. Teaching experience, 9 years.

Absent on Leave.

MABEL COWDREY HIMROD

Director of Home Economics

Diploma, Pratt Institute; Graduate work with Pratt Institute, Teachers' College, and the University of Chicago. Teaching experience, 11 years.

88 N. Marengo Ave.

ALFRED GUILLOU

Director of Manual Arts

A. B., Princeton University; L. L. B., University of Pennsylvania; Graduate work with Yale University and Throop Polytechnic Institute. Teaching Experience, 7 years.

150 S. Los Robles Ave.

HARRY CLARK VAN BUSKIRK

Associate Professor of Mathematics

Ph. B., Cornell University. Teaching experience, 11 years.

723 N. Michigan Ave.

ADA JANE MILLER

Instructor in English

Ph. B., Cornell College and the University of Chicago; Graduate work with the University of Chicago and with Leland Stanford, Jr., University. Teaching experience, 11 years.

107 Ford Place

HARRY DAVIS GAYLORD

Assistant Professor of Mathematics

A. B., Harvard University. Teaching experience, 7 years.

552 N. Raymond Ave.

HARRY TRUMBULL CLIFTON

Assistant Professor of Physics

Ph. B., Sheffield Scientific School; Yale University; Graduate work with the University of California. Teaching experience, 6 years.

871 N. Lake Ave.

FRANK CHAMBERLAIN BODINE

Assistant Professor of Chemistry and Mechanical Drawing

Graduate work with the University of Cincinnati, and with Willis G. Hale, Philadelphia. Teaching experience, 3 years.

534 N. Fair Oaks Ave.

CHARLES EMORY BARBER

Assistant Professor of History

A. B. and A. M., University of Nebraska. Teaching experience, 16 years.

528 N. Los Robles Ave.

EDWIN S. DU PONCET

Instructor in Spanish and Latin

A. B., Ozark College; A. B. and A. M., University of Missouri; Ph. D., Central University; Ph. D., Heidelberg University. Teaching experience, 11 years.

135 N. Raymond Ave.

PEARL BLANCHE FISHER

Instructor in French

Graduate Normal School, Throop Institute; Graduate work in Paris, France, and in Lacase Institute, Lausaune, Switzerland. Teaching experience, 9 years.

Los Angeles

WALTER WILLIAM MARTIN

Instructor in Wood Working

Graduate Normal School, Throop Polytechnic Institute. Teaching experience, 9 years.

CLARENCE ARTHUR QUINN

Instructor in Forging

Graduate Normal Department, Stout Manual Training School. Teaching experience, 10 years.

515 N. Marengo Ave.

HOWARD BROWN FOSTER

Instructor in Machine Shop Practice and Pattern Making

B. S., Worcester Polytechnic Institute. Teaching experience, 3 years.

315 Center St.

HOMER WALDO SPIERS

Instructor in Athletics and Gymnastics

A. B., Oberlin College; Diploma, Department of Physical Education, Oberlin College; Graduate work with Teachers' College. Teaching experience, 3 years.

919 Albany St., Los Angeles

ERNEST BRYANT HOAG

Lecturer in Biology

B. S., Northwestern University; A. B., Leland Stanford Jr. University; A. M., Northwestern University; M. D., same. Teaching experience, 14 years.

101 N. Los Robles Ave.

NELLIE ALEXANDRA WARD

Instructor in Wood Carving

Graduate, Throop Polytechnic Institute. Teaching experience, 5 years.

53 Pepper St.

MARGARET JEANET STEWART

Instructor in Expression and Physical Culture

Graduate, Cumnock School of Oratory, Northwestern University; Graduate work with Cumnock School of Expression, Los Angeles. Teaching experience, 10 years.

385 N. Raymond Ave.

MARGARET ISABEL DONALDSON

Instructor in Art

Graduate, Normal Art Department, Thomas Manual Training School, Detroit; Pratt Institute; Student, Handicraft Guild, Minneapolis. Teaching experience, 3 years.

88 N. Marengo Ave.

GRACE FISHER

Instructor in Domestic Science

B. S., Columbia University; Diploma, Teachers' College. Teaching experience, 3 years.

1034 N. Los Robles Ave.

MARIAN ELSIE CRAIG

Instructor in Mathematics

A. B., Pomona College; Graduate work with the University of California. Teaching experience, 4 years.

509 E. Walnut St.

LOUIE KOOSER WILLITS

Instructor in Domestic Art

Graduate, Normal School, Throop Polytechnic Institute; Graduate work with Teachers' College. Teaching experience, 10 years.

137 S. Madison Ave.

S. WEBSTER FRENCH

Instructor in Chemistry and Physiography

B. S., Cornell University; Graduate work with the University of California. Teaching experience, 7 years.

221 N. Euclid Ave.

THORNTON HENRY LODGE

Instructor in Commercial Subjects

Graduate, Halifax Business College. Teaching experience, 15 years.

"The London," Mary St.

IDA GRAY

Instructor in English

A. B., Leland Stanford Jr. University. Teaching experience, 15 years.

221 N. Euclid Ave.

EFFINE BLOUNT

Instructor in German

A. B., Indiana University; Graduate work with the same. Teaching experience, 6 years.

76 N. Michigan Ave.

NELBERT MURPHY

Instructor in Arts

Graduate, Pratt Institute. Teaching experience, 3 years.

272 N. Los Robles Ave.

ASSISTANTS:

MRS. M. LODGE, Commercial Subjects

JAY BUXTON, Handicrafts

LUELLA PORTER, Domestic Science

LEROY BROWN, Wood Working

SIDNEY SHUTE, Wood Working

Officers of Administration

Faculty Council

President Scherer, Dean Chamberlain, Junior Dean Stacey, Professors W. K. Gaylord, Ford, Gilmore, and Mrs. Coleman.

Other Officers

Theodore Coleman, Secretary and Business Agent; Grace Wright, Assistant Secretary; Ruth Gaylord, Assistant Librarian; Ernest Bryant Hoag, A. M., M.D., Medical Examiner; Edith J. Claypole, Ph. D., M. D., Medical Examiner.

Faculty Committees

(The President is ex-officio a member of all Committees)

Admission:—Dean Chamberlain, Junior Dean Stacey, Registrar Gaylord.

Registration and Classification:—Professors W. K. Gaylord, Gilmore, Ford, Guillou, Van Buskirk, Batchelder, Coleman, Miss Himrod.

Athletics:—Mr. Spiers, Professors Ford, Milliken, Du Poncet, Misses Stewart and Craig.

Literary and Musical Organization:—Miss Stewart, Professors Coleman, Miller, Van Buskirk, Barber, Mr. Lodge.

Social Activities:—Professor H. D. Gaylord, Misses Donaldson, Pearl Fisher, Grace Fisher, Messrs. French and Quinn.

Student Body Advisory:—Junior Dean Stacey, Professor Miller, Professor Van Buskirk.

The Induction of President Scherer *

Among the beautiful customs that have come down to us from the past, few are more pleasing or valuable than the celebrations with which we mark the epochs in our lives. We enjoy these events in anticipation and in their realization, and we treasure the memory of them after they are over. They have a certain ministry of education for us, and they always help to commit us anew to our better ideals.

Thus we celebrate the graduation of our children and youths from schools and colleges; thus we emphasize their confirmation in religion; thus we consecrate them in marriage; so we mark their entry into a new profession. In this way we dedicate churches and institutions and men; and all concerned feel more or less an inspiration, and are given afresh to their saner ambitions.

The dedication of a progressive man of power to be a college president marks an epoch in the life of the college and in the career of the man. Neither can ever be the same afterwards. The college is likely to take on some new shades of policy and to feel some impulses of new life; and the man is usually tempered by the sense of a responsibility that is as awful as battle and as sacred as life. The installation becomes then, as it ought always to be, a consecration.

We are gathered here tonight to bestow such a dignity upon such a man. We are to hear words of welcome, and of the duties and rewards of this office, from the lips of others whom Providence has called heretofore to like responsibilities. We are finally to

*Opening remarks by Dr. Norman Bridge, Chairman of the Board of Trustees at the public installation of the President, November 19, 1908.

listen to his own interpretation of his office, and of his hopes and ambitions for this institution and for this people. We are here to honor him and the college alike, and, let us hope, to be ourselves dedicated to some part in the work of both.

After greetings from the University of Southern California through Dr. Healy; Pomona College through President Gates; Occidental College through President Baer; Whittier College through President Newlin; and the Carnegie Institution through Dr. George E. Hale, Dr. Bridge said:

Dr. Scherer: In formally investing you with the office of President of Throop Institute we do not offer you any key, real or metaphoric, of a building. We present to you rather a commission to a charge of singular usefulness and of vast responsibility.

It is a momentous thing in the life of a man to find his true work, and it is a tragedy when he misses it. It is equally momentous that great human interests and forces find a fit captain—as it is a sinful waste when they fail of it. This hour, it seems to us, has brought the man and the work together.

Your apparent preparation for this duty has been a continuous process since your childhood—in a profounder sense the beginning of your preparation dates far back of your grandparents. Study of many sorts in many lands, varied uplifting activities, and triumphs over obstacles, have ripened your mind and character for this labor. While still young it is your privilege to enter upon what promises to be your final work and the consummation of your career.

You have been called hither with ingenuous unanimity, and your election is sine die. If your success as president is to be measured by the genuineness of your welcome and by our faith in you, it will be phenomenal indeed.

Forty years ago, the dean and Nestor of American college presidents—himself a model for all scholars and all men—was installed in Harvard college. Now, covered with glory and honor, and while yet vigorous, he returns his commission to the authority that gave it. He has lived to see under his leadership a revolution in pedagogy, and in the curricula of study in schools and colleges, and the vindication of the axiom that, in matters of education, common sense and the demands of this age are as sacred as tradition. He has made us understand that the human world moves, and every student in all this land has become his debtor. May your experience here be as fortunate. May your hand be as steady and your poise as imperturbable as his have been. And may you creditably administer the office you now assume, becoming and remaining the foremost private citizen of this community, till far toward the midday of this twentieth century.

Our academic friends and neighbors have honored us by coming here tonight; and they have brought for you their gifts of welcome and counsel. We have welcomed you to our hearts already, and we now offer you some gifts that we would fain hope may cheer your spirit and make your burden lighter. We give you first the frank good will of the people of this incomparable community. I am sure they are anxious to help you in any way they can. Some can do little, others much; but all can help somewhat and somewhere. Many of them are ignorant of the fact that a college of your kind is the greatest moral and civic asset that distinguishes such a community as this from others less fortunate, and they are waiting for you to discover to them their opportunities.

We bring you the gift of loving labor—the most

wholesome, joyous and unselfish. We cannot hope that you will always find your task easy—we trust and believe you will have strength for your task; and no finer work awaits the hand of man this side of the stars.

We give you the single-minded loyalty and mutualness in service of your governing board. They may not always agree with you; and they may sometimes try to convince you that they know as much about an institution of learning as you do, but most of them in their hearts will know better; and if they cannot convince you, they will be glad to be converted at your hands.

We present you an ample, virgin college campus, with stately trees and a grand view of the mountains; with all the smiles of nature upon it, and pictures of magnificence for the future. Nor do we try to disguise the significant interrogation mark beneath these pictures.

We give you a talisman of power, which is the ability, after you have sought what aid and encouragement you may, and planned as carefully as you can for every issue and responsibility, to bear your ultimate burdens philosophically and alone.

Finally we bring you two gifts which are the talismans of youth, and the joint antidote to the fossilization of age. One is the ambition to be the means of such original work as shall add to the knowledge of the world and to the equipment of mankind. The other is a radiant vision of an unending procession of children and youths—exuberant with energy and power—on the way to school in the morning. The children pass into youths and the youths into maturity and out of the column, but while they are there

they are for you to inspire and guide. As you incline your ear to the music of these charms, your life shall be transfigured with gladness, and although years may wrinkle your face and whiten your hair you shall never grow old.

And now, by the authority of the Board of Trustees, your work-fellows in service more than your legal superiors, and with the assistance of this concourse of neighbors and friends who are graciously here as witnesses, you are declared to be the confirmed and very president of Throop Institute.

"The Throop Idea"*

Who is the truly educated man? The best answer to that question of which I have any knowledge is in these words:

Huxley on the Educated Man

"That man, I think, has had a liberal education who has been so trained in youth that his body is the ready servant of his will, and does with ease and pleasure all the work that, as a mechanism, it is capable of; whose intellect is a clear, cold, logic engine, with all its parts of equal strength and in smooth working order; ready, like a steam engine, to be turned to any kind of work and spin the gossamers as well as forge the anchors of the mind; whose mind is stored with a knowledge of the great and fundamental truths of Nature and of the laws of her operations: one who, no stunted ascetic, is full of life and fire, but whose passions are trained to come to heel by a vigorous will, the servant of a tender conscience; who has learned to love all beauty, whether of Nature or art, to hate all vileness, and to respect others as himself."**

Note the full roundness of this remarkable exposition of education. The body, rejoicing in healthy activity, is trained to the nobility of skilful labor; for "honor lies in honest toil." The intellect is severely athletic, ceaselessly storing the cells of the mind with the golden pollen of truth. The passions are curbed by a vigorous will. while conscience sits enthroned,

*Installation Address, President James A. B. Scherer, Throop Institute, November 19, 1908.

**T. H. Huxley. An address before the South London Workingmen's College, 1868.

served by the ministry of goodness and charity and beauty.

This is a high ideal. It is something new in the educational world. The time has been when the intellect lorded over all, begetting the "stunted ascetic." In our own time manual training, to the exclusion of purely intellectual pursuits, has heralded the resurrection of the body from its limbo of medieval oblivion. There have always been schools of esthetics and ethics. But the time has come for a higher ideal, when the trinal powers of man—body, mind, and spirit—shall proceed to co-equal development in the production of men who are whole. Throop Institute, with three articles in its creed—Science, Arts, Industry—plans to train intellect, spirit, and body alike to the measure of perfected manhood. Such is "the Throop idea"—an idea that is also an ideal, but an ideal that is altogether practical. Robert J. Burdette expressed it happily in a baccalaureate address ten years ago. "Do not think that Throop sends out into the world merely good artisans. It gives the world artists; men and women equipped for intellectual work; qualified to fill high positions in office, in counting-room, in workshop, in the laboratory, positions that call for high culture and the exercise of clear judgment. It aims to give to the world such grocers as George Peabody and Johns Hopkins; such printers as Benjamin Franklin; such bricklayers as Ben Jonson; such tailors as Andrew Jackson; such merchants as Stephen Girard; such tanners as Ulysses S. Grant; such telegraph operators as Thomas Edison; such rail splitters as Abraham Lincoln." This, from the beginning, has been "the Throop idea."

The Threefold Idea

Burdette on Throop Institute

The Institute was fortunate in its founder. Dr. Conger, the only member of the original Board of Trustees who still serves in that honored and useful capacity, said at Father Throop's funeral in 1894: "His life is a greater eulogy than words can frame. And yet that life was a simple as a child's. Its simplicity was its grandeur. God gave him the few simple elements that make a man. He accepted the material and the task. And with his simple tools he wrought as one inspired by a great theme, and one who loved his task. Work was his joy. And so he worked from day to day into the long, long years, until at nearly eighty-three the work was done and he laid down his tools. The last day found him very early in the morning with plants and flowers and workmen to beautify the spot that marked his useful labor. He worked till noon, took a hasty lunch, and had in his hands plants from his own yard which he suddenly laid down to take up the laurel wreath immortal which awaited him. 'But what will become of my school?' was his anxious word. I answered: 'You have done your whole duty nobly. Pasadena will take care of your school.'"

Throop's Founder

That death-bed promise has been kept from year to year as the school expanded, and will be redeemed in full in a manner of which the fond founder of Throop Institute himself never dreamed, before we are many years older. For if the Institute was fortunate in its founder it has certainly been favored by its friends. Never have I seen a Board of Trustees more faithfully devoted to their trust nor a town more loyal to "the gown" than here at Throop Institute in Pasadena. And when I said to Father Throop's

Throop's Friends

friend, last summer, Dr. D. K. Pearsons of Chicago, when debating whether I should come here or not: "Will those people do as they say?" the old man replied with the fire and energy of a youth: "They'll do twice as much as they say, Boy! Their eyes shine with love for that school!" In such faith I have come; feeling deeply, I do assure you, untried and unworthy in this moment of immeasurable opportunity; but desiring that it might at least be some day said of me, as Stanley said of young Glave: "He was one of those men who relish a task for its bigness, and who greet hard labor with a fierce joy."

Throop's Future

Throop Institute throws a challenge to the future. In this city of the mountains and the sea, where to breathe the tonic air is in itselt a sort of "fierce joy," an inspiration that makes a great task a relish,—here in the heart of the red-blooded young West, where men are not afraid of gray yesterdays, nor yet fearful of the misty dawn of to-morrow,—here amid unfading flowers that shall not enfeeble but only refresh us, in the sight of scarred mountains that shall not overwhelm but only speak to us of everlasting strength, we throw down the challenge of youth. Here shall be a school content with nothing lower than the best; resolved to set itself fixedly towards its ideals regardless of educational traditions when these might hamper its growth, yet eager to conserve whatever heritage may help it forward in fulfillment of its destiny. We want scholars in our faculty chairs who are not blindly imitative, but who are gifted with open-eyed initiative—that is to say, "the ability to do the right thing at the right time without being told," and to communicate this power to their sudents

The Faculty

as something infinitely more important than a pot-pourri of unassimilated facts. We seek men as the heads of departments who are flexible in their attitude towards methods, not of a cast-iron rigidity; never exalting the means above the end, but contrariwise determined to secure the right results at the pains of inventing new means. We want no scholarly recluse or self-indulgent bookworm on our roster of instructors, but genial souls with "a talent for friendship," a love for the workaday world, and the ability to turn their text-book theories into practice. Moreover, our leaders should at least approximate Huxley's famous ideal of the truly educated man, who knows "everything about something, and something about everything"—trained men and keen specialists, but also broadly cultured. Above all, they must have character. Given these, with a clearly defined policy that will supply a real educational demand, together with such splendid student material as Throop already possesses—unsurpassed the country through—and there is no reason why we should not build in this veritable garden of the gods a typical American school of the twentieth century. We are aware that we aim high; but we are willing to work hard; and we expect to win.

The Main Policy

The chief policy of the greater Throop was fixed by the Board of Trustees last winter, and in taking the public into our confidence I can do no better than quote you the words that fixed it, spoken by a member of the Board of Trustees who brings to us a wisdom of experience, a dignity of achievement, and an alertness of intellect that make his services valuable beyond computation—a man who honors Pasadena with his citizenship, one of the foremost men of science in

the world, Dr. George Ellery Hale, of Mount Wilson. After pointing out that the remarkable development of German foreign commerce beyond that of England within the last quarter of a century has undoubtedly arisen from the superior technical schools abounding in Germany, so that England, at length awake and startled, is actually introducing engineering into Oxford in an attempt to regain lost prestige,—Dr. Hale said:

Dr. Hale's Advice

"Here, two causes have conspired to further the development of our industries and our foreign commerce: the native ingenuity and aggressiveness of the American, and the immense natural resources of the country. These have off-set, in large degree, the painstaking research of the less inventive German and have overcome the prestige so long enjoyed by England in foreign markets. But, as natural resources show signs of ultimate exhaustion, and as engineering methods advance from their earlier stage to that condition where the highest efficiency is the chief element of success, the research methods of the German must receive more attention. We understand already that a thorough technical training is required by an engineer. But the full appreciation of the importance of research has come only in some of the greatest of American industries. For the same reason that the General Electric Company now maintains a great research laboratory, in which new methods are developed and old processes are improved, it may confidently be predicted that this and similar examples will be followed in the future by manufacturing establishments, great and small, throughout the United States.

"Here in California the conditions and the need

for technical education are unsurpassed. In no part of the world is electrical engineering so highly developed, especially in the transmission of power from great distances. In hydraulic engineering, we are facing to-day an undertaking of enormous magnitude. Eastern technical schools are far removed, those of the north insufficiently developed and also too remote. Under such conditions, and with the advantages afforded by climate, by the immediate neighborhood of mountains where water-power can be developed and experimental transmission lines installed, who can deny that there is a place in Pasadena for a technical school of the highest class?

"In developing such a school, we must provide the best of instruction and the most perfect equipment that modern engineering offers. But in laying stress upon the practical aspects of the problem we must not forget that the greatest engineer is not the man who is trained merely to understand machines and to apply formulae, but is the man who, while knowing these things, has not failed to develop his breadth of view and the highest qualities of his imagination. No great creative work, whether in engineering or in art, in literature or in science, has ever been the work of a man devoid of the imaginative faculty. In seeking to develop the school, therefore, let us not forget that our prime object should be to graduate men capable of conceiving vast projects, not less than men whose abilities are limited to the power of executing them. With the rapid development of engineering in all directions, and the constant increase in the amount of detailed information placed before the student, the difficulty of securing the requisite breadth of view is serious. In most technical schools this problem has not been solved, and the opportunity

stands open for Throop to devise and carry into effect a broad scheme of education which may give proper recognition to all sides of the engineer's life."

A New Plan in Engineering

The knottiest problem connected with such a curriculum,—which, as all must agree, is desirable,—seems to be the question of time. There are only six working days in the week, and the working hours of each day must be adjusted so as not to overtax adolescence. Moreover, engineering is a science which continually expands, so that even the masters of the business find it hard to keep abreast of the times. How much more difficult it must be to teach immature students of engineering all of the rapidly multiplying details of their craft!—especially in view of the fact that what they succeed in learning of the newest details to-day may be superseded by other inventions to-morrow. But to face a difficulty frankly is often to find that it wears no frown. And, in this particular instance, since the strong man will get the details when he enters the lusty school of life, and since they will do the weak man but little good, anyhow, why not boldly challenge the assumption of most of our technical schools that you have got to teach your student everything, especially since this is impossible? What he learns by all means let him learn thoroughly, as a part of his innermost fibre; but let this be principles illustrated by facts, not the facts taught for themselves. The principles once imbedded in his nature, he will become, as it were, a creator, instead of a mere mechanician. The successful professor of engineering, therefore, will not permit himself to be fettered by the limitations of conventional methods. He must be able to cast his text-books to the winds, and select

his examples or illustrations from a structure or a mechanism with which his students are familiar as a fact of their commonplace experience; from this concrete fact he deduces for their use its fundamental principle, its truth, henceforth to become their mental property, which they can turn back into fact. Once this relation of thought and action is clearly established, the students will possess personal initiative and a desire for invention instead of blindly following tradition. They will cease their unthinking imitation of others, and become individual creators. It is not necessary that they leave the college with a vast mental store of crude facts, but it is necessary that they know what they want when confronted by a problem, where to find it when they want it, and how to use it when they find it. And thus my engineer should be grounded deep and hard in the good basic knowledge of his business, but not overwhelmed with detail. If he is worth much—I repeat it—he will get the details later on; if he is worth little, they will never do him service anyhow. Then I should fill this saved time of his with the acquaintaince of nature through her noble developmental laws, and of the uplifting kinship of his race through a study of evolution in human history, especially the civilization of his own ancestral Europe. Next he should narrow down to England and America with their codes and customs and their inspiring literature, while by generous open lectures the ministry of music and of art should so serve this young workman of the world that when he went forth to his duties he should take with him "sweetness and light," as well as force. The typical school of to-morrow is to be predominantly technical, yet saturated throughout its departments with the cream of old-fashioned culture, minus stale whey. I see loom-

ing large in my fancy a school that shall train men to do with their hands in the best manner possible of doing, but at the same time broaden and enrich their minds with the love of history and poetry and song, and moreover provide for the ripening of the heart through a constant inculcation of ideals. Is it but a dream? It shall come true. You and I shall see it in our time—when Oxford shall shake hands with Pittsburg. Give your man keen individual training, but let him also have his place in the universal. Do you remember the sad confession of Darwin, the greatest specialist of his times? "Up to the age of thirty," you read in his Life and Letters, "poetry of many kinds, such as the works of Milton, Gray, Byron, Wordsworth, Coleridge, and Shelley, gave me great pleasure, and even as a schoolboy I took intense delight in Shakespeare. I have also said that formerly pictures gave me considerable, and music very great delight. But now for many years I cannot endure to read a line of poetry. I have tried lately to read Shakespeare and found it so intolerably dull that it nauseated me. I have also almost lost my taste for pictures or music.—My mind seems to have become a kind of machine for grinding general laws out of large collections of facts, but why this should have caused the atrophy of that part of the brain alone on which the higher tastes depend I cannot conceive. If I had to live my life again I would have made a rule to read some poetry and listen to some music at least once every week; for, perhaps, the part of my brain now atrophied would thus have been kept active through use. The loss of these tastes is a loss of happiness, and may possibly be injurious to the intellect, and more probably to the moral character, by enfeebling the emotional part of our nature."*

Darwin's Confession

*Life and Letters of Charles Darwin, vol. i, p. 100. Murray, 1887.

Charles Eliot Norton

Conversely with this testimony from Darwin, the late Charles Eliot Norton has well said:—"It is only through the exercise of the imagination that a man can live a life that is in a true sense worth living. For it is the imagination which lifts him from the petty, transient, and physical interests that engross the greater part of his time and thoughts in self-regarding pursuits, to the large, permanent, and spiritual interests that ennoble his nature, and transform him from a solitary individual into a member of the brotherhood of the human race."*

Throop's Aim

The greater Throop will aim to furnish thoroughgoing and resourceful engineers, who will yet be kept wholesomely human by means of the essential humanities. That is the Throop idea as I conceive it.

What are the essential humanities? What is the irreducible minimum of culture? What is the logical programme of the liberal arts in greater Throop, in distinction from the technical branches? I reply, with much temerity, as follows:

The Four Essential Humanities

There are four things that the cultured young American has got to know: the harmony of natural laws; the evolution of human history, especially in Europe; the development of Anglo-American civilization as reflected in the English language and literature; together with American civics and business law.

1. Natural Science

When I say "the harmony of natural laws" I am thinking of the sciences with especial reference to the method by which they should be taught. It is little short of

* An Introduction to Dante. Warner Library, vol. viii, p. 4315. 1897.

an educational crime to teach physics and chemistry, mathematics and biology and astronomy, for example, as so many unrelated branches. Give your youth his vision of the unity of things and he will inevitably become a larger man. Besides, it will be far easier to teach him when you teach in a reasonable manner. Let him see that mathematics is not an arbitrary system of symbols devised for the purpose of his torture, but a wonderful discovery and setting down in signs of the eternal relations of things, not only as exemplified in engines and twentieth-century aeroplanes, but also in the organs of his lithe young body, the trunks of California live-oaks, the structure of light and of sound, the chemistry of every drop of rain, and the harmony of spheres in the far-off Milky Way. Show him the stars themselves as a forest of trees—full of saplings beginning to grow, and giants flowering in their prime, and dead trunks that strew the firmament with peril. Show him chemistry as the music of nature, and physics as the poetry of motion. Reveal him to himself as an ivory temple with its secret innermost shrine, and teach him that nature is a priestess. Bind the natural sciences together in a rainbow of promise to his vision, and let it lure him with its pot of fairy gold.

2. European History; Modern Languages

Through the second group of humanistic studies guide him with the same bright thread of law. Show him that human society has grown as grow the trees. Let him see with the eyes of his young imagination that "casual savage" who "cracked two stones together; a spark; and man was arm'd" against the world. Teach him that the story of Prometheus was no myth, but that "those heroes of invention, whoever they were, who first kindled flame, did more for human weal than

any of their successors in the hierarchy of creative power, for it was their triumph that made possible every other." Trace the story of invention from the wheel and the hinge to the spectro-heliograph and the dirigible balloon, untangle the mottled skein of social progress from Lamech's Song of the Sword to the Second Conference of the Hague and Japan's welcome to the American fleet. To do all this you do not need many text-books, you need chiefly a sane and chastened and informed imagination and a vision of the unity of things. You cannot give him a vast Hegelian view of the philosophy of human history, but you can take such a master as Guizot and show him his own little Europe as the bee-hive which exemplifies the whole. One of the languages, at least, should have its place—French or German or Spanish—but not as unrelated to history. You are teaching natural law in the social world, remember, and language is the chief miracle in man's development.

3. English

Then I would narrow down to Anglo-American civilization as reflected in English literature and language, for the student should study intensively the things that lie closest home. Certainly he should have decent and respectful acquaintance with his noble mother tongue; it is incredible that engineers should not know the tools of the English language. But more than this—the civilization of any given nation is inevitably reflected by the history of its literature as in a mirror; for literature always responds with the precision of a magnetic needle to the dominant ideals of a people. If the engineer is to know the men of his kind, with whom he has to deal far more formidably or intimately, as you please, than with bridges or dynamos, he must read them in the pages of the great

writers of English from Chaucer and Shakespeare to Rudyard Kipling and Mark Twain.

4. Civics and Business Law

Finally, if he is to go out and make the new history of his people, he must have a knowledge of the science of American government, developed from the same central unity that builds the farthest star, and a knowledge of how the same law that he learns in the laboratory is applied to the management of business. Having these four groups of acquirements, commonly known as the natural sciences, European history (with an illustrative language), the English language and literature, and American civics and business law, but acquired in a rational and sanely related manner, your engineer is not far from the kingdom of culture.

There is one thing more that he needs; to his acquirements he must add appreciations. It is not necessary or even desirable that he know the technique of music or the trick of art, but I do maintain that every cultured man should know the difference between Turner and Gibson, for example, and be able to discriminate between Franz Lehar and Beethoven. In other words, he must know how to appreciate music and art. Now, the appreciation of good music and art is almost altogether a matter of familiarity with them. It is so,—to a large extent, at least,—with higher literature. We are of such a strange conceit that we resent what we do not know, and to "save our face," as the Chinese say, put on a masque of contemptuousness. Thus the ignoramus masquerades as a snob; and in the majority of cases the man who sneers at Browning is simply the man who has never read Browning's poetry. So with classical

"Appreciations;" Open Lectures

music. The charitable view to take of people who frankly prefer rag-time to symphonies is just to assume that they are not familiar with symphonies. In this case, familiarity dispels contempt. Therefore I would have in the Throop that-is-to-be a generous course of open lectures, every winter, which the students would have to attend, but which would be so attractive that you could not hold them away. Get a man like John van Dyke to come to talk to them for a while on the meaning of pictures, revealing the masters by aid of that modern lamp of Aladdin, the magic lantern, as he goes along. Bring Huneker or Henderson here to open their ears to great music, in lectures illustrated with harmony. Let Gunsaulus or somebody like him give a series of revelatory talks on the higher ministry of poetry, and let Doctor Hale and Professor Kapteyn—as they have already consented to do for us this season—unfold the structure of the stars. Make these lectures an integral part of your courses. Let them come at night, so that you find the time for them. And your engineering student will thus acquire those appreciations which form the very luxury of culture.

By all means, I would say, let these liberal lectures beckon to the town. Throop Institute will fail of its mission, and Pasadena of its opportunity, unless the two grow into closer bonds of mutual helpfulness as the years go by. We already derive from you I know not what of generous open-handed sympathy and breathe an atmosphere of those refinements that Pasadenans have culled from all parts of the country, —a creme-de-la-creme of good things. I think that the chief asset of Throop is its site—Pasadena the incomparable. But we ask still more of you. We

Town and Gown

invite you to make those great new buildings that will soon nest among the live-oaks as though they had grown up together the center and source of good things, and true and beautiful things, for the town itself. Let the library and museum and lecture courses and everything else that we shall have be yours as well as ours; school and city so uniting in the quest for things that are lovely and of good report that here we shall have our little Athens of the flower gardens, in this sunny peninsula of the great Aegean ocean.

In a business way, moreover, I would see the school and city linked together. We are here to train young men to work, and to train them to work well. The city has need of workmen, and good workmen, in its shops and on its streets. I can see no conceivable reason why the remarkable plans of Mr. William Thum for mutual helpfulness between "town and gown" should not be "tried out," as the saying is, between Pasadena and Throop. Let the school authorities recommend to the city from time to time such young men as are competent in handling hydraulic or electrical machinery, at an entirely reasonable wage. The hours could be easily adjusted to such an arrangement. Let them get not only the practical experience that can come alone from handling actual conditions as they exist in an actual world, but also the privilege of self-help which is so important in the building up of American manhood. Thus the city could be well served by its own sturdy sons while at the same time every wage would be an investment in manhood. "The strength and glory of a town," as Luther says, "does not depend on its wealth, its walls, its great mansions, its powerful armaments; but on the

number of its learned, serious, kind, and well-educated citizens."

I believe that this participation between city and school in the world's work would tend distinctly to breed better citizens out of our youth. I saw the other day an arraignment of college men that seemed to have some truth in it. This was a complaint that these bachelors, when they go out into the state, are likely to assume a merely critical attitude towards public affairs, and sit in the cheap seat of the scornful. They have learned the text-book theories of civics and political economy, but, having learned no more, they tend to smile with supercilious superiority on the mistakes of others less fortunate. Might we not in Pasadena by such an arrangement as I have suggested give the young men such a taste of actual civic affairs that they would become something far better than tiresome doctrinaires, that is to say, good citizens? It is a tragical pity that the word politics has fallen into sad repute. There are few nobler words in the language. It means the science of service—the enlistment of an individual for the common weal, the commonwealth, the public welfare. Let us lift it out of the mire, here at Throop, by giving our boys a practical training in civic affairs that will afterwards make them practical and unselfish citizens.

Good Citizenship

You will see that we are hoping great things for Throop Institute. Well, I don't know that anything worth while ever came to the man who hadn't hoped for it, and, besides, I am willing to confess that while Throop is as yet a "small college" I am not afraid of the bugaboo of bigness if bigness should come to us naturally and because we deserve it. But I do hope that we may never lose that advantage of the smaller

colleges over the large ones that comes from individual oversight. President Jordan said very cleverly when my friend and brother, Dr. Baer, was installed two years ago: "The value of any teacher diminishes as the square of his distance increases. A very great man may be of very little consequence to the students if his distance from them is so great that the square of his distance has diminished their knowledge of the character and nature of the man." And President Harms, in his installation address at Newberry on the sixth of November spoke as follows: "You can never really educate a man with a blackboard and a book. You must give him love. You must give him comradeship. You must somehow touch his springs of manhood and ambition, and the only way to do that is with friendship, and no school is ideal for any man that is too large to make that possible."

Individual Attention

If, in the course of human events, Throop should ever cease to be a small college, we intend to eat our little cake and at the same time keep a part of it for good luck. In the first place, we intend to make an innovation on that extremely unreasonable tradition which confines the direct influence of the leading professors to the Senior and Junior classes, instead of letting them lay their rich personalities on the Freshmen and Sophomores, who are even more plastic and impressionable. Suppose, in our humanistic branches, that we shall be able to secure as the heads of those four departments men of commanding ability and power. My plan would be to have those four men meet all of the four classes en masse at least once a week, no matter how large the classes, and instruct them. Then I should wish to give to each of those heads of departments a sufficient number of keen

young preceptors, somewhat after the manner of Princeton, to break the classes up into small groups for individual attention. The tutors would form little cabinets around the heads of departments, reporting on the progress of each carefully classified group, and the chiefs would direct their respective policies in harmony with one another and with the central scheme of the school. I believe that in this way it would be feasible and also economically wise to conduct a large school largely without the sacrifice of that individual attention which has always been a feature of Throop.

The Academy

But we would never give up the "Academy." It is there; it has done a noble work; let it stay. The greater Throop will need its fitting school, and no better supply of that need could be devised than a readjustment of the present academy. Not only so,—I should hope always to see general courses maintained not only in the Academy for such as would not become engineers, but also in the college proper, on the side of the humanistic branches. Perhaps our baccalaureate degrees might be confined to mechanical and electrical engineering, at least for the immediate future, but we might have such a high standard in our general courses that a "certificate" from the new Throop would mean more than a "diploma" means at the present.

General Courses

I have talked very freely of our hopes and plans, because we belong to you, and we want you to know what they are. I hope that these plans may be criticized, for if they are not wise we want to know it, and change them. Only two classes of people, you know, never change their minds—dead people and fools. We know that we are not dead, because dead people do

not live in California; we are, on the other hand, willing with St. Paul to seem fools in order that we may be truly wise, if the only foolishness of our plans is their novelty. We shall cling to them, certainly, until we find something better. And I pledge you, Mr. President, and you also, my friends of Pasadena, to abate not one jot nor tittle of endeavor so long as we stand shoulder to shoulder, facing forward, in earshot of the challenge to duty.

"Here let us build, but not with stones alone;
Let's build with courage, faith, and enterprise,
With daring and a challenge to the unknown,
And most with honesty. Let's build a house
Wherein by spirit-subtle alchemy
Men may transform the wise high thoughts of old
To new and golden deeds. Then shall we build
As I have dreamed we built. Majestic walls
Wherein the fertile brain of youth shall breed
The thoughts that on white-winged ships shall fly
To wake the slumbering barriers of the world;
Sky-soaring towers whose every stone shall be
The mother of a city far away.
The scholar's taper in his room on high
Shall be a star to pierce the utmost dark,
And guide poor men. From hence shall justice flow,
And truth, to fill the healing founts of law;
Schemes shall be laid, imperial ventures born,
Young hands shall sow the seed of government,
Young hearts and noble minds shall make this place
An altar sacred with their sacrifice.
This is my dream—
God send it to come true." *

* J. B. Fagan. The Book of Words of the Oxford Pageant. 1907. Adapted.

See the Announcement on inside page of back cover.

A Condensed Statement of the Curriculum *

Throop Institute comprises three distinct departments: College, Normal Arts, and the Academy.* The College gives the degree of Bachelor of Science in Electrical or Mechanical Engineering, together with selected general courses without degrees. The department of Normal Arts prepares teachers to give effective training in elementary and secondary schools. The Academy equips for the College, and provides an adequate high school training by means of carefully selected general branches, for students who are not applicants for the collegiate degree. The College, beginning with the next session in September, will occupy magnificent quarters on the site of the "Greater Throop."

The Academy and the department of Normal Arts are housed in three excellent buildings near the heart of the city of Pasadena. A dormitory on Los Robles avenue accommodates at low cost a limited number of young men. Extremely inexpensive but wholesome and nutritious luncheons are prepared for all students that desire them in the basement of the great "East Hall." A condensed statement of work offered in the three schools of the Institute follows.

* There is also an excellent "Polytechnic Elementary" School (with nineteen teachers) affiliated with the Academy of Throop Institute, which prepares for this and other academies. It occupies commodious new buildings on East California street, near the "Greater Throop" campus, and is cordially recommended to our patrons for the training of younger pupils. Catalogues may be obtained from the Principal, Miss Virginia Pease, who is also the matron of the Throop Dormitory, 289 North Los Robles Avenue.

I. The College

1. Mechanical Engineering:—In addition to the essential humanities (see page 27) and the professional lecture courses, the applicant for a degree is required to obtain proficiency in the principles of mechanism, theoretical and applied mechanics, prime movers, engine details, and laboratory experimentation, both mechanical and hydraulic. For admission to the Freshman class the student must show nine full units* of preparation in English (3), French or German (2), American History and Civics, (1) and algebra and geometry (3). He must also have had six additional units of work made up from among the natural sciences, the languages, and general history, previous experience in shop work counting as two units among these electives. For graduation he must add to the following list of fixed studies a sufficient number of electives to make a total of 120 units. **

FIRST YEAR.

English, Trigonometry, Chemistry, Physics, Mechanical Drawing, Freehand Drawing, Analytical Geometry.

SECOND YEAR.

American History, Differential and Integral Calculus, Mechanical Drawing, Mechanism, Shop Work, Electricity and Magnetism, Electrical Laboratory, European History, Machine Details, Graphic, Statics Shop Work, Electrical Engineering.

THIRD YEAR.

Socio-Economics, Applied Mechanics, Machine Design, Me-

* The unit here represents the amount of preparation normally obtained in one year's work in a secondary school at the rate of five periods weekly.

** A unit is equivalent here to one hour of lecture or recitation, or three hours of shop, laboratory, or drafting, weekly throughout one term.

chanical Laboratory, Prime Movers, Shop Work, Hydraulic Laboratory, Prime Movers.

FOURTH YEAR.

Economic Development of the United States, Machine Design, Surveying, Engine Details, Commercial Law, Mechanical Laboratory, Mechanical Engineering. Thesis.

2. Electrical Engineering:—In addition to the humanities (see page 27), candidates for a degree must show proficiency in the principles of direct and alternating currents, electrical design, transmission and distribution of power, electric railways and telephones, and laboratory experimentation. Requirements for admission to the Freshman class are the same as for Mechanical Engineering. For graduation the following course of studies is necessary, in addition to a sufficient number of electives in the general courses to make a total of 120 units.

FIRST YEAR.

English, Trigonometry, Chemistry, Physics, Mechanical Drawing, Freehand Drawing, Analytical Geometry.

SECOND YEAR

American History, Differential and Integral Calculus, Mechanical Drawing, Mechanism, Shop Work, Electricity and Magnetism, Electrical Laboratory, Machine Details , Graphic Statics, Shop Work, Direct Currents, Electrical Engineering Laboratory.

THIRD YEAR

Socio-Economics, Applied Mechanics, Machine Design, Shop Work, Mechanical Laboratory, Alternating Currents, Electrical Engineering Laboratory Hydraulic Laboratory.

FOURTH YEAR

Economic Development of United States, Mechanical Laboratory, Surveying, Electrical Design, Electric Railways, Commercial Law, Prime Movers, Power Transmission, Telephone Engineering, Thesis.

II. The Normal School

The demand for graduates of the Normal School far exceeds the supply. While the department cannot guarantee positions to its graduates, it assists them in every possible way. Already 136 men and women have been sent out as teachers, and have met with remarkable success. A course of two years is provided. Admission may be obtained through satisfactory examination or by means of acceptable certificates.

Subjects and Methods of Instruction

1. Elements of Psychology.—A study of the laws of psychology and their educational implications. Recitations and practical work. Five periods a week throughout the year.

2. Pedagogy.—Special investigation and research. Topics most intimately related to teachers and school officers. Methods of studying various school conditions; measurements of mental, moral and physical qualities; the curriculum; relative values of studies; examinations, experimentation and questions in child study; treatment of statistics. Research work, recitations, reports, discussions and lectures. Five periods a week throughout the year.

3. History of Education.—The history and principles of education, their relation to present-day conditions. The educational epochs of the past and their relation to social, industrial, and educational evolution. Practical work, assigned readings, reports, and lectures.

4. Organization and Methods in Manual Training.—The development of the manual training idea, its significance in the schools of today, and its relation to the various subjects of the curriculum; the organization, equipment, cost and management of departments; study of typical systems and methods of teaching. Lectures, reports and practical work.

5. Theory and Practice of Teaching Domestic Science.—Methods of teaching in the grades and high school; scope, character, and classification of the subject matter; educational values of domestic science; relation to the school curriculum; planning and teaching lessons; organization of the work; laboratory management; equipment.

6. Theory and Practice of Teaching in Elementary and Secondary schools; educational values of domestic art; subject matter for courses of study and the relation to the curriculum; observation of lessons, planning, teaching; organization of the work; equipment, plans, cost.

7. Organization and Methods in the Fine Arts.—Lectures on the history of painting, sculpture, architecture, and the applied arts, illustrated by photographs and lantern slides; talks on methods of instruction, to be followed by discussions and papers, and the actual test of methods in class room teaching.

III. The Academy

Requirements for Admission

Students holding a certificate of graduation from a California grammar school, or any other school of equivalent grade, will be admitted without further

examination. All other applicants will be subject to examination in arithmetic, grammar, English, geography and United States history.

In arithmetic the examination will be upon the following subjects: fundamental operations, factoring, greatest common divisor, least common multiple, fractions, denominate numbers, applications of percentage, involution, evolution, mensuration, and the metric system; in grammar and English, upon composition, spelling, punctuation, use of capital letters, elements of English grammar and the analysis of the sentence, "Lady of the Lake" and "Evangeline."

The subjects taught in the Academy and the credits earned by each are given in the following table: (See next page.)

For completion of the course a student must take all the subjects under the heading, "Required Subjects," and, in addition, enough from the "Elective General Subjects" and "Elective Manual Subjects" to earn a total of 24 general credits and 12 manual credits. General credits at the rate of 2 general credits for 3 manual credits, may, however, be substituted for the 12 manual credits.

Subjects designated for certain years may in some cases be elected in other years. In such cases they are listed for the first regular year in which they may be taken.

No one is permitted to take more than one manual training course (two periods daily) at a time, except in the case of an advanced student making up work.

REQUIRED SUBJECTS

FIRST YEAR	Credits	SECOND YEAR	Credits	THIRD YEAR	Credits	FOURTH YEAR	Credits
English I	2	English II	2	English III	2	American History	1.3
Elementary Algebra	2	Plane Geometry	2			Civics	.7

ELECTIVE GENERAL SUBJECTS

FIRST YEAR	Credits	SECOND YEAR	Credits	THIRD YEAR	Credits	FOURTH YEAR	Credits
Ancient History	2	Mediaeval & Modern History	2	English History	2	English IV	2
Expression	1	French II	2	French III	2	French IV	2
Voice Culture		German II	2	German III	2	Trigonometry	1
French I	2	Latin II	2	Latin III	2		
German I	2	Spanish II	2	Spanish III	2		
Latin I	2	Botany	2	Higher Algebra	1		
Spanish I	2	Zoology	2	Solid Geometry	1		
Physical Geography	2	Bookkeeping II	2	Chemistry I	2		
Physiology and Hygiene	2	Commercial Law	2	Physics I	2		
Bookkeeping I	2						
Commercial Arithmetic	1						
Commercial Geography	2						

ELECTIVE MANUAL-TRAINING SUBJECTS

FIRST YEAR	Credits	SECOND YEAR	Credits	THIRD YEAR	Credits	FOURTH YEAR	Credits
Freehand Perspective	0.5	Art Training	0.5	Water Color	0.5	Mechanical Drawing IV	1
Mechanical Drawing I	0.5	Pen and Ink	0.5	Art Training	1	Pattern Making II	0.7
Wood Work I	2	Printing and Illuminating	0.5	Handicraft	2	Machine Shop II	1.3
Elementary Wood Carving	2	Still Life	0.5	Mechanical Drawing III	1		
Domestic Science	2	Advanced Wood Carving	2	Pattern Making I	0.7		
Sewing	2	Clay Modeling	2	Machine Shop I	1.3		
Physical Culture	1	Mechanical Drawing II	0.5				
		Wood Work II	2				
		Forging	2				
		Dressmaking	1.3				
		Millinery	0.7				

Miscellaneous Information

Location

Pasadena is generally acknowledged to be one of the most beautiful cities in the world. It is situated within ten miles of Los Angeles, at the head of the San Gabriel Valley, and at the base of the picturesque San Gabriel Mountains. In beauty and healthfulness, in the culture of its homes, and in its high social and moral influences, Pasadena has no superior. It is reached by the Santa Fe, the Salt Lake, the Southern Pacific, and the Pacific Electric railways. Pasadena is known as a city of schools and churches. Saloons have never been known within its borders, as they are forbidden by the city charter. It is notable also for a curfew law, which is but one evidence of the safeguards that surround its youth. It is no uncommon thing to find articles in the popular magazines treating of Pasadena as a model municipality.

Admission

Students desiring to enter Throop Institute are required to furnish satisfactory evidence of good moral character and of honorable dismissal from the school last attended, together with statements from former schools or teachers showing in detail the amount and character of previous training. Blanks for this purpose will be furnished on request. Detailed requirements for admission are given elsewhere.

Hours

The daily exercises begin at 9 o'clock in the morning and continue until 4:05 in the afternoon, with an intermission from 11:40 to 12:30. College shopwork

is given on Saturday from 8:30 to 12:30. Assembly is held regularly on Friday at 9:45, all students being required to attend.

Discipline

It is taken for granted that students enter the Institute with serious purposes and that they will cheerfully conform to such regulations as may be made by the Faculty. The moral tone of the Institute is exceptionally good, and cases requiring severe discipline seldom occur. Any conduct harmful to the moral atmosphere of the Institute will render a student liable to dismissal. Parents may at any time be asked to withdraw from the Institute students whose work is unsatisfactory by reason of lack of diligence.

Athletics

Encouragement is given to athletics, but very careful supervision is kept over the various branches, the Athletics Director being a regular member of the Faculty and having direct control of all phases of the work. Students entering athletics are required to undergo a thorough medical examination. These examinations are given without charge to the students by the medical examiners of the Institute, Drs. E. B. Hoag and E. J. Claypole.

Membership in any of the teams is subject to forfeiture for failure in any regular line of school work.

The athletic grounds include a basketball court, two tennis courts, a field for baseball and football and an eight-lap running track.

An out-door gymnasium, provided with good equipment, is in daily use.

Organizations

Several literary, debating, oratorical and musical organizations are maintained by the students of the Institute with the co-operation of the Faculty. They afford an opportunity for training in debate, parliamentary practice, etc.

Students of all Schools form an association called the "Associated Students." Its objects are to control all matters of general student concern and to deal with such details of deportment and discipline as the Faculty may delegate to it. A fee of seventy-five cents per term for the use of the Association is levied upon all students and is payable to the Business Manager of the Institute at the beginning of each term.

Registration

The last days of the summer vacation and the first day of each term are set apart for the registration of students. A special registration fee of one dollar is charged to all who register later than the first day of each term.

Tuition

The school year is divided into two terms. For College students the tuition fee is $100 per school year, $55 of which is payable at the beginning of the first term, $45 at the beginning of the second term. For all other students the tuition fee is $85 per school year, $45 of which is payable at the beginning of the first term, $40 at the beginning of the second term. All students in attendance less than a school year pay for either entire term the tuition fee fixed for the first term, and for the fraction of a term they pay for the time in attendance at the yearly tuition rate plus 20 per cent. of such **pro rata** amount, except that no re-

duction is made in the tuition of any student who may enter during the first quarter of a term, or who may leave during the last half of a term.

No reduction or refund is made to any student who may be suspended or expelled or who may leave school without a reason that shall be deemed valid by the Faculty Council.

Shop and Laboratory Fees

Fees are required in the following work, payable at beginning of each term:

Basketry—Normal Domestic Economy	$ .75
Biology	1.50
Chemistry	7.50
Clay Modeling	1.75
Cooking, Academy	9.00
Electrical Engineering	5.00
Forging	6.00
Free-hand Drawing, Painting and Design	.75
Handicraft	.75
Manual Arts, Normal	4.50
Pattern and Machine Shop	3.75
Physics	1.50
Sewing and Dressmaking, either or both	.75
Typewriter, Use of	1.50
Wood Carving, (1st year, 1st term)	.75
Wood Shop	2.25

Breakage and damage done to buildings, books, furniture, equipment, etc., or any tools lost, will be charged to the student responsible for the same.

Locker Fees

The Institute is provided with individual lockers for the safe keeping of books and other personal property, the use of which is compulsory for all students.

Gymnasium lockers are also in place. Locker fees are 60 cents per term, and 25 cents additional as a deposit for key, the latter to be repaid upon return of the key. Two pupils may use the same locker at 90 cents per term and 25 cents deposit for each key.

Term bills are payable strictly in advance, and students must submit the Secretary's receipt for the same to each instructor whose classes they may seek to enter.

Diploma and Certificate Fees

College $5.00
Normal School or Academy 2.00

Financial Statement

Although Throop Institute requires from $80,000 to $90,000 a year to pay its operating expenses and meet its current obligations, the financial condition of the school was never sounder than at present. Its revenues are not sufficient to pay its expenses, but good friends are each year found willing and able to contribute to its deficiency fund. It is in the certainty of a continuance of this confidence in its work and mission that its officers and trustees are pressing forward toward a realization of the larger plans for the Institute.

The corporation depends chiefly upon tuitions for revenue, its endowment funds available for income amounting to less than $200,000. These funds are mainly in the form of investments in real estate, the latest acquisition to the realty being the magnificent 20-acre tract donated to the school for a new site.