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# COURSES OF STUDY FOR THE PREPARATION OF TEACHERS OF MANUAL ARTS

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# COURSES OF STUDY FOR THE PREPARATION OF TEACHERS OF MANUAL ARTS.

## I.—INTRODUCTION.

The training of special teachers of manual arts is of comparatively recent origin. Most of the institutions whose courses have been studied in the preparation of this paper have organized definite curricula within the last decade. It is therefore apparent that the pioneer days are still with us.

The Massachusetts Normal Art School, established in 1873, was among the first schools in the United States to offer courses of this sort. However, the school early turned its attention to the art field and has not specifically trained teachers of the type we are considering. The Trenton (N. J.) Normal School offered certain technical courses as early as 1890, or a little later, but it was only the man of unusual ability who would be selected as a special teacher of manual arts. Pratt Institute developed a combination art and manual training course about the same time. However, some of these students later went to Teachers College, Columbia University, for courses in pedagogy, for which adequate provision was not made at Pratt Institute at that time. By a curious coincidence, the present Teachers College students, a generation later, may get their technical courses at Pratt Institute.

The first definite organization of a course to prepare special teachers of manual training was made by Teachers College in 1891, when Prof. Charles A. Bennett was called from the principalship of the St. Paul (Minn.) Manual Training High School to become head of the department of manual training. He had the honor of offering the first course in the pedagogy of the manual arts ever given for an advanced degree. He also had the privilege of determining in a large measure the character of the Macy Manual Arts Building, which became the model in arrangement and equipment for many other schools. The first man to graduate from this course was William F. Vroom, who is still engaged in teaching in the New York public schools.

In the Middle West small beginnings were made in private institutions, such as the Chicago Manual Training School, which later became a part of the University of Chicago; the Francis W. Parker School; Bradley Polytechnic Institute; and in the State normal

schools. The most recent additions are the special State normal schools for training these teachers, and the departments of manual arts in our State universities.

## II.—NUMBER AND CHARACTER OF SUCH INSTITUTIONS IN THE UNITED STATES.

A study of available material indicates that there are not less than 184 institutions of various kinds in the United States which offer more or less extended curricula designed for the preparation of teachers. There are also three in our territorial possessions—one in Porto Rico; one in Honolulu, and one in the Philippines. These schools are of the following types, the numerals indicating the numbers in each case: 23 State universities, 13 private universities, 6 colleges, 17 State agricultural colleges, 15 State teachers colleges, normal colleges, and normal universities, 3 State manual training normal schools, 62 State normal schools, 15 colored schools with normal departments, 8 private schools with normal departments, 10 technical schools with normal departments, 4 private normal schools, 7 municipal colleges, universities, and normal schools.

*Institutions having curricula for preparation of manual training teachers.*

| Location | Institution. | Location. | Institution. |
|---|---|---|---|
| ALABAMA | | CONNECTICUT. | |
| Auburn | Alabama Polytechnic Institute. | Hartford | Hillyer Institute. |
| Florence | State Normal School. | DISTRICT OF COLUMBIA. | |
| Jacksonville | Do. | Washington | Howard University (colored). |
| Livingston | Do. | GEORGIA. | |
| Montgomery | Agricultural and Mechanical College for Negroes. | Atlanta | Atlanta University (colored). |
| Normal | State Normal School for Negroes. | HAWAII. | |
| Troy | State Normal School. | Honolulu | Territorial Normal School. |
| Tuscaloosa | University of Alabama. | IDAHO. | |
| Tuskegee | Normal and Industrial Institute (colored). | Albion | State Normal School. |
| ARIZONA. | | Lewiston | Do. |
| Flagstaff | State Normal School. | Moscow | University of Idaho. |
| Tempe | Do. | ILLINOIS. | |
| Tucson | University of Arizona. | Carbondale | Southern Illinois State Normal University. |
| ARKANSAS. | | Charleston | State Normal School. |
| Fayetteville | University of Arkansas. | Chicago | Lewis Institute. |
| CALIFORNIA. | | Do | University of Chicago. |
| Berkeley | University of California. | Do | Chicago Normal College. |
| Chico | State Normal School. | Do | F. W. Parker School. |
| Fresno | Do. | Do | Chicago Technical College. |
| Los Angeles | Do. | Decatur | James Millikin University. |
| San Diego | Do. | De Kalb | State Normal School. |
| San Francisco | California School of Mechanical Arts. | Macomb | Do. |
| San Jose | State Normal School. | Mooseheart | Vocational and Industrial Institute. |
| Santa Barbara | State Normal School of Manual Arts and Home Economics. | Normal | State Normal University. |
| Stanford University | Leland Stanford, jr., University. | Peoria | Bradley Polytechnic Institute. |
| COLORADO. | | INDIANA. | |
| Fort Collins | State Agricultural College. | Bloomington | Indiana State University. |
| Gunnison | State Normal School. | LaFayette | Purdue University. |

*Institutions having curricula for preparation of manual training teachers*—Continued.

| Location. | Institution. |
|---|---|
| INDIANA—contd. | |
| Princeton | Princeton Normal and Industrial University. (colored). |
| Terre Haute | Indiana State Normal School. |
| Valparaiso | Valparaiso University. |
| IOWA. | |
| Cedar Falls | State Teachers College. |
| Des Moines | Des Moines College. |
| Iowa City | State University of Iowa, Department of Manual Arts. |
| Shenandoah | Western Normal College. |
| KANSAS. | |
| Emporia | State Normal College. |
| Hays | Fort Hays Kansas Normal School. |
| Lawrence | University of Kansas. |
| Pittsburg | State Manual Training Normal School. |
| KENTUCKY. | |
| Berea | Berea College. |
| Frankfort | Kentucky Normal and Industrial Institute. |
| Lexington | University of Kentucky. |
| Lincoln Ridge | Lincoln Institute of Kentucky (colored). |
| Richmond | State Normal College. |
| LOUISIANA. | |
| Baton Rouge | Louisiana State University and Agricultural and Mechanical College. |
| Natchitoches | State Normal School. |
| MAINE. | |
| Gotham | State Normal School. |
| Orono | State Agricultural College. |
| MASSACHUSETTS. | |
| Boston | Sloyd Training School. |
| Do | Massachusetts Normal Art School. |
| Do | Franklin Union. |
| Cambridge | Harvard University. |
| Fitchburg | State Normal School. |
| MICHIGAN. | |
| Detroit | Thomas Normal Training School. |
| Kalamazoo | State Normal School. |
| Mount Pleasant | Do. |
| MINNESOTA. | |
| Mankato | State Normal College. |
| Minneapolis | University of Minnesota. |
| Moorhead | State Normal School. |
| St. Cloud | Do. |
| St. Paul | Macalaster College. |
| Do | University of Minnesota, College of Agriculture. |
| St. Peter | Gustavus Adolphus College. |
| Winona | State Normal School. |
| MISSISSIPPI. | |
| Starkville | Mississippi Agricultural and Mechanical College. |
| Shelby | Industrial Agricultural College for Negroes. |

| Location. | Institution. |
|---|---|
| MISSOURI. | |
| Cape Girardeau | State Normal School. |
| Columbia | University of Missouri. |
| Warrensburg | State Normal School. |
| MONTANA. | |
| Bozeman | State College of Agriculture. |
| NEBRASKA. | |
| Lincoln | University of Nebraska. |
| Peru | State Normal School. |
| NEW HAMPSHIRE. | |
| Durham | New Hampshire College of Agriculture and Mechanic Arts. |
| Keene | State Normal School. |
| Plymouth | Do. |
| NEW JERSEY. | |
| New Brunswick | State Agricultural College. |
| Trenton | State Normal School. |
| NEW MEXICO. | |
| East Las Vegas | State Normal University. |
| Silver City | State Normal School. |
| NEW YORK. | |
| Albany | State College for Teachers. |
| Alfred | Alfred University. |
| Brooklyn | Pratt Institute. |
| Buffalo | State Normal School. |
| New York City | Teachers College (Columbia University). |
| Do | New York University. |
| Do | Hunter College of the City of New York. |
| Do | Ethical Culture Schools |
| Oswego | State Normal School. |
| Rochester | Mechanics Institute. |
| Syracuse | Syracuse University. |
| NORTH CAROLINA. | |
| Greensboro | State Normal College. |
| Raleigh | Shaw University (colored). |
| Do | St. Augustine's School. |
| West Raleigh | State College of Agriculture and Engineering |
| NORTH DAKOTA. | |
| Ellendale | State Normal School. |
| Fargo | North Dakota Agricultural College. |
| Grand Forks | University of North Dakota |
| Mayville | State Normal School |
| Minot | Do. |
| Valley City | Do. |
| OHIO. | |
| Athens | Ohio University. |
| Bowling Green | State Normal College |
| Cincinnati | University of Cincinnati. |
| Cleveland | Cleveland School of Education. |
| Columbus | Ohio State University. |
| Dayton | St. John Normal School. |
| Delaware | Ohio Wesleyan University. |
| Kent | State Normal College. |
| Oxford | Miami University. |
| Toledo | Toledo University. |

*Institutions having curricula for preparation of manual training teachers*—Continued.

| Location | Institution. |
|---|---|
| **OKLAHOMA.** | |
| Ada | State Normal School. |
| Alva | Do |
| Edmond | Do. |
| Norman | University of Oklahoma. |
| Stillwater | Oklahoma Agricultural and Mechanical College. |
| Tahlequah | State Normal School |
| Weatherford | Do. |
| **OREGON.** | |
| Corvallis | Oregon Agricultural College. |
| **PENNSYLVANIA.** | |
| Bloomsburg | State Normal School. |
| Edinboro | Do. |
| Indiana | Do. |
| Lewisburg | Bucknell University. |
| Mansfield | State Normal School. |
| Philadelphia | Philadelphia Trades School. |
| Do | Temple University. |
| Pittsburgh | Carnegie Institute of Technology. |
| Do | University of Pittsburgh. |
| Reading | Normal Training School. |
| State College | Pennsylvania State College |
| Williamson School | Williamson Trade School. |
| **PHILIPPINE ISLANDS** | |
| Manila | Philippine Public Schools. |
| **PORTO RICO.** | |
| Rio Piedras | Normal College. |
| **RHODE ISLAND.** | |
| Providence | State Normal School |
| **SOUTH CAROLINA.** | |
| Columbia | University of South Carolina. |
| Orangeburg | Colored Normal, Industrial, Agricultural, and Mechanical College of South Carolina. |
| Do | Claflin University (colored). |
| **SOUTH DAKOTA.** | |
| Aberdeen | State Normal School. |
| **TENNESSEE.** | |
| Johnson City | East Tennessee State Normal School. |
| Knoxville | Knoxville College (colored). |
| Do | University of Tennessee. |
| **TENNESSEE—contd.** | |
| Memphis | West Tennessee State Normal School |
| Murfreesboro | Middle Tennessee State Normal School. |
| Nashville | State Agricultural and Industrial Normal School for Negroes. |
| Do | George Peabody School for Teachers. |
| **TEXAS.** | |
| Austin | University of Texas. |
| Canyon City | State Normal College. |
| College Station | Agricultural and Mechanical College of Texas. |
| Commerce | East Texas State Normal College. |
| Denton | College of Industrial Arts. |
| Do | North Texas State Normal School. |
| Huntsville | Sam Houston Normal Institute. |
| Prairie View | State Normal and Industrial College (colored). |
| San Marcos | State Normal School. |
| **UTAH.** | |
| Logan | State Agricultural College. |
| Salt Lake City | University of Utah. |
| **VERMONT.** | |
| Burlington | University of Vermont. |
| **VIRGINIA.** | |
| Hampton | Hampton Normal and Agricultural Institute (colored) |
| Williamsburg | College of William and Mary. |
| **WASHINGTON.** | |
| Bellingham | State Normal School. |
| Cheney | Do. |
| Ellensburg | Do. |
| Pullman | State College of Washington. |
| Seattle | University of Washington. |
| Do | Public School Department. |
| **WEST VIRGINIA.** | |
| Morgantown | West Virginia University. |
| **WISCONSIN.** | |
| Madison | University of Wisconsin. |
| Menomonie | Stout Institute. |
| Oshkosh | State Normal School |

## III.—TYPES OF CURRICULA AS TO CHARACTER AND LENGTH OF TIME REQUIRED.

An almost infinite variety of courses are being offered in these schools. It has not been possible to secure catalogues or other information from a large number; hence the following list may not be inclusive of all types:

1. The University of Wisconsin has a part-time plan in operation through its extension department, whereby men of superior ability as workmen in the trades are given some brief specific instruction as to methods and principles of teaching. A somewhat similar

plan has been followed by the University of Indiana for tradesmen, in connection with the Smith-Hughes Act.

2. One-year course. A few institutions offer a course of but one year in length, as the Thomas Normal School, Detroit. In this case the various subjects are of necessity barely touched upon. The student is supposed to teach one year with success after his year in school before receiving the diploma.

3. The regular two-year normal course. This is typical of State normal school practice everywhere. The student follows prescribed courses in education, and in review and special methods courses in the common branches with permission to take a limited number of units of credit in manual training. For example, in the two-year curriculum for high-school graduates leading to the advanced diploma at the Moorehead (Minn.) State Normal School, 120 hours, or two terms, of such work may be selected. At the Warrensburg (Mo.) Normal School a student may elect not more than 10 semester hours of technical subjects for the so-called "60 semester hour course." In the former case the amount would be about 7 per cent of the entire course, including practice teaching; in the latter case the amount may not exceed 16 per cent.

4. Three-year combination. A number of the State normal schools offer a curriculum of one year of specialized technical training, based upon the previous completion of the regular two-year course. Arrangements seem possible permitting the student to arrange his work so that the technical work may be spread out over the three years. The student receives both the regular normal (two-year) diploma and a special certificate or diploma. In the case of the Macomb (Ill.) State Normal School, 13 of the 28 credits are in manual training, while the balance are the regular courses.

At the Northern Normal and Industrial School, Aberdeen, S. Dak., 130 term hours of general subjects and 65 term hours of technical subjects are specified as required. The remaining 165 term hours are electives, of which 27½ may be technical. In short the offering of the department is apparently exhausted when the student has taken 92½ hours of technical work, which is approximately 25 per cent of the total of 360 term hours required for graduation.

5. Two-year curricula for specialists are quite common. These vary in the proportion of time given to the technical and to general subjects according to the institution. The State normal schools commonly stress subject matter and methods courses in the common branches more than do the private technical schools. There is also considerable variation as to the aim of these courses. For example, at Bradley Institute it is rather expected that the two-year man will "teach in the upper grammar grades or the smaller high school." He is given a variety of technical subjects but is not supposed to become a narrow specialist because of his training. The Peru

(Nebr.) State Normal School has a two-year course entitled "Supervisor's course in manual training." At Stout Institute each student selects in his second year two of the four lines of work offered, and to that extent becomes a specialist in his teaching.

6. Three-year courses. A number of schools offer three-year curricula which place emphasis upon the technical subjects. The aim is to prepare men for positions in the larger high schools and in vocational schools.

7. Four-year courses. Curricula of four years are becoming comparatively common. These are offered by the universities, technical schools, and some of the State normal schools. Some lead to a degree; others apparently do not. In general these courses may be grouped under the following heads:

(*a*) Curricula which frankly train specialists in manual arts and which give considerable emphasis to definite technical work with less consideration of academic material.

(*b*) Curricula dividing the program equally or nearly so between technical courses and related special methods courses on the one hand, with general courses in education, English, etc., on the other.

(*c*) Several universities permit a student to "major" in the manual arts department and to carry a sequence of courses amounting to approximately one-fourth of his total requirement. The exact amount varies with institutions; for example, at the University of Wisconsin as many as 40 semester hours, or one-third of graduation requirements, are allowed. At the University of Chicago a "long sequence" of 9 majors may be taken, thus covering one-fourth of the 36 majors required for the degree. It is, however, possible for a student to take a maximum of 15 majors of work within any department, so that he may devote 40 per cent of his time to the chosen field.

(*d*) In a similar manner students may elect manual arts as a "minor" for their degree. At the University of Iowa this will total 14 semester hours out of the 120 required for graduation.

8. Special courses of decided technical character are being offered by such schools as Williamson Free School of Mechanical Trades, Bradley Institute, and others. At the former institution, the student spends three years learning a trade as a regular indentured apprentice. He then must spend not less than two years in commercial work as a tradesman. He may then return for a period of 11 months for specific preparation fitting him for teaching. At Bradley Institute a course is available for teachers of automobile work. The first year is entirely technical in character and is complete in itself. The student then enters a commercial garage for actual experience. If he does approved work for a period of not less than three months, he may return for a second year of work in which emphasis is placed upon pedagogy, English, chemistry, and practice teaching, in addition to certain technical courses.

## IV.—ENTRANCE REQUIREMENTS.

Admission requirements in normal schools are so varied and complex that classification requires individual treatment of each institution. However, available catalogues almost without exception call for the completion of four years of approved high-school work as admission requirements. There are certain additional prerequisites found in many cases. The University of Missouri asks for experience in the trades before admitting men to the two-year course. The same rule is followed in the case of Williamson School of Trades, as previously noted. The Fitchburg (Mass.) Normal School will admit men who have had either (1) four years of high-school work, (2) four years of experience in an approved trade, or (3) a combination of 1 and 2.

## V.—FACULTIES.

The following table indicates, as far as a study of catalogs permits, the number of instructors who may be considered as members of the manual arts department in their respective schools. The exact figures can not be determined in most of the larger institutions as the shopwork is often done in the engineering shops, and is taught by men who evidently belong to the engineering college of the institution. This table indicates the character of training of these instructors as to kind of degree or diploma held.

*Degrees held by instructors of manual training.*

| Institutions. | Degrees. | | | | | | | Diploma. | Number in department of manual arts. |
|---|---|---|---|---|---|---|---|---|---|
| | A.M. | M.S. | A.B. | B.S. | B.S.M.E. | Ph.B. | B.Ar. | | |
| University of Missouri | 1 | | 1 | 3 | 1 | | | | 8 |
| Ohio University (Athens) | | 1 | | 2 | | | | | 3 |
| Ohio State University | 1 | | 1 | 2 | 2 | | | | 11 |
| Iowa State University | | | 1 | | | | | | |
| University of North Dakota | | | 3 | | 1 | | | 1 | (a) |
| Miami University | | | | 1 | | | | | 4 |
| University of Chicago | | | | 1 | | 3 | | | 9 |
| Stout Institute | | | | 1 | | | | | 9 |
| Bradley Institute | 1 | | | 2 | 3 | | 1 | 6 | 13 |
| Kansas State Manual Training Normal School | | | 1 | 2 | 2 | | | 2 | 12 |
| Warrensburg (Mo.) Normal School | | | | | | | | 1 | 7 |
| Macomb (Ill.) Normal School | | | | 1 | | | | 1 | 1 |
| De Kalb (Ill.) Normal School | | | 1 | | | | | | 2 |
| Aberdeen (S. Dak.) Normal School | | | | 1 | | | | | 2 |
| Trenton (N. J.) Normal School | | | | 1 | | | | 3 | 3 |
| Indiana State Normal School | | | | (c) | | | | | (b) |
| West Tennessee State Normal School | | | 1 | | | | | | 4 |
| Moorehead (Minn.) State Normal School | | | | | | | | | 1 |
| New Mexico State Normal School | | | | 1 | | | | 1 | 2 |
| Northeastern Oklahoma State Normal School | | | | | | | | | 1 |
| Gunnison (Colo.) State Normal School | | | | | | | | | 1 |
| Peru (Nebr.) State Normal School | | | 1 | | | | | | 1 |
| Oshkosh (Wis.) State Normal School | | | 1 | 2 | | | | | 3 |
| Iowa State College | 1 | | | 1 | 1 | | | 2 | 7 |
| | | | | | | | | 3 | 4 |

[illegible] Incomplete. [illegible] Not given.

Since the success of the graduates of any school is in a large measure dependent upon the experience as well as the training of the faculty, an attempt was made to note the teaching and trade experience of the members of the manual arts faculty. This was possible in a few cases only, as such information is seldom given in the annual catalogs. The following table indicates the findings in the cases of four institutions:

*Teaching and trade experience of the instructors of manual training.*

| Institutions. | Instructors. | Average teaching experience, in years. | Average trade experience, in years. |
|---|---|---|---|
| Stout Institute | 13 | 8.7 | 6 |
| Bradley Institute | 12 | 9 | 5½ |
| Kansas State Manual Training Normal School | 7 | 8 | 3 |
| Iowa State College | 4 | 11½ | 4 |

## VI.—EQUIPMENTS—BUILDINGS, LABORATORIES, SHOPS.

While it is obvious that adequate training is dependent upon ample physical resources and equipment, it is difficult to make a comparative study of schools. As a rule the State universities make use of the equipment found in (*a*) engineering classes or (*b*) model high schools. The variations run from elaborate to meager. Normal schools as a rule are not very well equipped for lines other than simple woodwork. These follow in order: Mechanical and freehand drawing, craft work, leather, clay, basketry, printing, metal working, machine shop, forging.

Strong courses for the preparation of teachers involve considerable outlay for equipment, as exemplified in the larger schools giving special emphasis to work of this character. Among eastern schools may be mentioned Williamson Free School of Mechanical Trades and Pratt Institute; in the Central West, Stout Institute, Oshkosh Normal School, Bradley Institute, Kansas State Manual Training Normal School. In general, the normal school or university equipment must be at least equal to what may be found in the schools in which the graduates teach. It should also be typical of good practice rather than so elaborate that the student is unable to adjust himself to mediocre conditions outside.

## VII.—TYPICAL TWO-YEAR COURSES OF STUDY.

The following outlines are arranged to show the number and nature of the subjects included in the two-year courses offered in several typical schools. The numeral following a subject indicates term or semester hours. The division in two or three parts indicates that the school runs on a basis of a term of 12 weeks or a semester of 18 to 20 weeks.

## UNIVERSITY OF MISSOURI.

*First Year.*

Psychology, 4.
Woodwork, 2.
Mechanical drawing, 2.
Tools and materials, 1.
Manual arts electives, 6.

Theory of teaching, 3.
Introduction to art, 5.
Metal work, 2
Manual arts electives, 5.

*Second Year.*

Administration of manual arts, 2.
Pattern making, 2.
Furniture making, 2.
Machine shop, 2
Elective manual arts, 5.

History of manual arts, 1.
Teaching manual arts, 2.
Furniture making, 2.
Machine shop, 2.
Manual arts elective, 8.

## BRADLEY INSTITUTE.

*First Year.*

History of education, 5.
* Woodworking, 5.
* Mechanical drawing, 5.
* Metal working, 5.

English composition, 5
* Wood finishing and upholstery, 5.
* Freehand drawing, 5.
* Sheet metal work, 5.

Psychology
* Carpentry and turning, 5.
* Mechanical drawing, 5.
* Art metal work, 5.

*Second Year.*

History of manual arts, 5.
Teaching mechanical drawing, 5.
* Teaching woodworking, 5.
* Design.

Principles of Teaching, 5.
* Constructive design, 5.
* Mechanical perspective, 5.
* Architectural drawing.

Advanced English composition, 5.
* Organization of manual arts, 5.
* Bookbinding and clay work, 5.
* Furniture making, 5.

## KENT (OHIO) NORMAL COLLEGE.

*First Year.*

History of education.
English composition.
Mechanical drawing.
Elementary manual training.

Psychology.
Library economy.
Freehand drawing.
Woodworking.
Metal working.

Principles of teaching.
Manual training literature.
Mechanical drawing.
Woodworking.

*Second Year.*

History of manual training.
Practice teaching.
House planning.
Principles of design.

Practice teaching.
Public school handwork.
Woodworking.
Constructive design.

Practice teaching.
Organization of manual training.
Woodworking.
Electives.

## DEKALB (ILL.) NORMAL SCHOOL.

*First Year.*

Psychology, 4.
Arithmetic, 4.
Mechanical drawing, 5.
Bench work, 10.
Printing, 10.

Psychology, 4.
Algebra, 5.
Themes, 1.
Mechanical drawing, 5.
Bench work, 10.
Printing, 10.

Political economy, 5.
Solid geometry, 5.
Mechanical drawing, 5.
Bench work, 10.
Printing, 10.

*Second Year.*

Course, equipment, 5.
Teaching.
Rhetoric, 5.
Sociology, 5.
Metal work, 5.

Teaching.
Advanced physics.
Turning.
Mechanical drawing.

Teaching.
History of Education, 5.
Book binding, 10.
Mechanical drawing, 5.

* Double periods.

## OHIO UNIVERSITY, ATHENS.

*First Year.*

Psychology, 3.
English composition, 3.
Mechanical drawing, 2.
School drawing, 1.
Elementary woodwork, 2.
Wood finishing, 2
Joinery, 2.

Principles of education, 3.
Forestry or English, 2.
Observation and methods, 2.
Mechanical drawing, 2.
Bench work, 2
Wood turning, 2.
School management, 2.
Shop equipment, 1.

*Second Year.*

History and organization of manual training, 2.
Teaching, 2.
Industrial education, 2.
Cabinet making, 2.
Pattern making, 2.
Carpentry, 2.
Mechanical drawing, 2.
Electives, 3.

Teaching, 2.
Cabinet-making, 2.
Constructive design, 2.
Mechanical drawing, 1.
Machine shop, 2.
Hammered metal work, 2.
Electives.

## IOWA STATE TEACHERS COLLEGE.

*First Year.*

Psychology, I 5.[1]
Psychology, II.
Freshman English, 5.
Mechanical drawing 5.
Woodwork, 7.
Perspective, 2½.
Design, 2½
Illustrative teaching, 1½.
Sheet metal work, 2½.
Elementary handwork, 2½

*Second Year.*

History of education, 5
Teaching, 5½.
Manual training methods, 5.
Woodwork, 5.
Woodturning, 2.
Special electives, 5.
General electives, 13½.

## OSHKOSH (WIS.) NORMAL SCHOOL.

*First Year.*

Psychology, 2.[2]
English composition, 3.
Mechanical drawing, 10.
Woodwork and turning, 10.
Forging, 10.
Freehand drawing, 2.
Applied design, 5.

Psychology, 2.
English composition, 3.
Mechanical drawing, 10.
Cabinetmaking, 10.
Pattern-making, 2.
Foundry practice, 10.
Freehand drawing, 2.
Applied design, 5.

*Second Year.*

History of manual training and courses of study, 5.
School management, 2.
Practice teaching, 3.
Advanced cabinet making, 15.
Crafts and applied design, 5.
Vocational mathematics, 5.

Organization of manual training, 5.
Practice teaching, 3.
Machine shop work, 15.
Craftwork 5.
Mechanical drawing and machine design, 5.
Construction and materials, 4.
Ten weeks of commercial shop experience prerequisite for graduation.

## MIAMI UNIVERSITY.

*First Year.*

Psychology, 3.[3]
English composition, 3.
Mechanical drawing, 3.
Woodworking, 3.
Object drawing and design, 1.
Trigonometry, 3.

Principles of teaching, 3.
English composition, 3.
Mechanical drawing, 2.
Woodworking, 3.
Object drawing and design, 1.
Shop mathematics, 3.

*Second Year.*

History of manual arts, 2.
School organization, 3.
Teaching and observation, 2.
Cabinet making, 3.
Constructive design, 1.
Descriptive geometry, 2.
Industrial arts elective, 2.

Organization and administration of vocational education, 3.
Observation and teaching, 2.
Special methods, 3.
Cabinetmaking, 2.
Constructive design, 1.
Descriptive geometry, 2.
Industrial arts elective, 2.
Entrance prerequisite:
Maturity, special mechanical ability or teaching experience.

[1] Each year has three terms. Numbers indicate term hours.
[2] Hours per week for 18 weeks.
[3] Semester hours' credit.

## VIII.—CLOCK HOURS DEVOTED TO EACH SUBJECT.

*Number of clock hours devoted to each subject in certain institutions.*

| Subjects. | Oswego (N. Y.) Normal School. | Indiana State Normal School. | West Tennessee Normal School. | Bradley Institute. | Illinois State Normal University. | Northern Illinois Normal School. | Ohio University, Athens. | Miami University. | University of North Dakota. | Iowa State Teachers College. | University of Missouri. | Oshkosh Normal School. | Stout Institute. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ACADEMIC SUBJECTS. | | | | | | | | | | | | | |
| English: | | | | | | | | | | | | | |
| Composition | ..... | 120 | 48 | 120 | 60 | 72 | 54 | 108 | 108 | 60 | ..... | 108 | 60 |
| Literature | ..... | ..... | 96 | ..... | ..... | ..... | ..... | ..... | 72 | ..... | ..... | ..... | ..... |
| Matriculation lectures | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 18 | ..... | ..... | ..... | ..... |
| Science: | | | | | | | | | | | | | |
| Elementary natural science | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Biology | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Physics | ..... | ..... | 48 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Mathematics: | | | | | | | | | | | | | |
| Algebra | ..... | ..... | ..... | ..... | ..... | ..... | 60 | ..... | ..... | ..... | ..... | ..... | ..... |
| Trigonometry | ..... | ..... | ..... | ..... | ..... | 60 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Shop mathematics | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Solid geometry | 100 | ..... | ..... | ..... | ..... | ..... | ..... | 54 | ..... | ..... | ..... | ..... | ..... |
| Arithmetic | ..... | ..... | ..... | ..... | 60 | 60 | ..... | 54 | ..... | ..... | ..... | 90 | ..... |
| Descriptive geometry | ..... | ..... | ..... | ..... | ..... | 48 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| History: | | | | | | | | | | | | | |
| Typical industries | ..... | 60 | ..... | ..... | ..... | ..... | ..... | 72 | ..... | ..... | ..... | ..... | ..... |
| Industrial history | ..... | 60 | ..... | ..... | 60 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 67½ |
| Political economy | ..... | ..... | ..... | ..... | ..... | 60 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Economics | ..... | ..... | 60 | ..... | 60 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 24 |
| Sociology | ..... | ..... | ..... | ..... | ..... | 60 | 120 | ..... | ..... | ..... | ..... | ..... | ..... |
| Electives, from studies listed above | ..... | 180 | ..... | Elec. | 90 | ..... | 36 | Yes. | 151 | 150 | ..... | ..... | Yes |
| Physical training | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | Yes. | Yes. | ..... | ..... | ..... |
| PROFESSIONAL SUBJECTS. | | | | | | | | | | | | | |
| Psychology: | | | | | | | | | | | | | |
| Elementary general | 100 | 60 | 96 | 60 | (1) | 96 | 54 | 54 | 72 | 120 | ..... | 72 | 67½ |
| Educational | ..... | ..... | 120 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 72 | ..... | ..... |
| Child study | ..... | ..... | 48 | ..... | 60 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| History of education | 50 | 60 | ..... | 60 | ..... | 60 | ..... | ..... | 72 | 60 | ..... | ..... | ..... |
| General methods | 50 | 60 | 60 | 60 | 60 | ..... | ..... | 54 | ..... | ..... | 54 | ..... | ..... |
| History of manual arts | 100 | 60 | 96 | 60 | 30 | ..... | 36 | 36 | 36 | 60 | 18 | 90 | ..... |
| Organization of manual arts | 100 | 60 | 48 | 120 | ..... | 60 | 18 | ..... | ..... | ..... | ..... | 90 | 90 |
| Administration of manual arts | 100 | ..... | ..... | ..... | ..... | ..... | ..... | 54 | ..... | ..... | 36 | ..... | ..... |
| Special methods | ..... | ..... | ..... | 180 | 60 | ..... | ..... | 54 | ..... | 36 | 36 | ..... | 90 |
| Observation | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 60 | ..... | ..... | ..... |
| Practice teaching | 600 | 60 | 60 | (2) | ..... | 240 | 96 | 72 | ..... | 114 | 36 | 150 | 270 |
| School administration | ..... | 96 | ..... | ..... | ..... | ..... | 54 | ..... | ..... | ..... | ..... | ..... | ..... |
| School management | ..... | ..... | ..... | ..... | 60 | ..... | 36 | ..... | ..... | 60 | ..... | 36 | ..... |
| Principles of education | ..... | ..... | ..... | ..... | ..... | ..... | 54 | ..... | 180 | ..... | ..... | ..... | ..... |
| Education electives | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| TECHNICAL SUBJECTS. | | | | | | | | | | | | | |
| Woodwork: | | | | | | | | | | | | | |
| Elementary | 100 | ..... | 180 | 120 | 240 | 360 | 140 | 324 | 180 | 168 | 90 | 180 | 202 |
| Cabinet making | 100 | ..... | 180 | 120 | 120 | ..... | 144 | 270 | ..... | 120 | 216 | 450 | ..... |
| Turning | 100 | ..... | ..... | 60 | 120 | 60 | 72 | ..... | 90 | 48 | ..... | (1) | ..... |
| Pattern making | 100 | ..... | ..... | ..... | ..... | ..... | 72 | ..... | ..... | ..... | 108 | ..... | ..... |
| Carpentry | ..... | ..... | (1) | 60 | 120 | ..... | 54 | ..... | 90 | ..... | ..... | (1) | ..... |
| Finishing | ..... | ..... | ..... | 60 | (1) | 72 | ..... | (1) | ..... | ..... | ..... | ..... | ..... |
| Upholstery | ..... | ..... | ..... | 60 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Metal work: | | | | | | | | | | | | | |
| Bench work | ..... | ..... | ..... | 120 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 135 |
| Art metal | 100 | ..... | ..... | 120 | 120 | 120 | 72 | ..... | ..... | ..... | 108 | 90 | ..... |
| Sheet metal | ..... | ..... | ..... | 120 | ..... | ..... | ..... | ..... | ..... | 60 | ..... | ..... | ..... |
| Forge | 50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 126 | ..... | ..... | ..... | ..... |
| Machine shop | 200 | ..... | ..... | ..... | ..... | ..... | 108 | ..... | 126 | ..... | 216 | 180 | ..... |
| Foundry | 50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

[1] Electives. [2] Twenty lessons. [3] Combined with other courses.

*Number of clock hours devoted to each subject in certain institutions*—Continued.

| Subjects. | Oswego (N. Y.) Normal School. | Indiana State Normal School. | West Tennessee Normal School. | Bradley Institute. | Illinois Normal University. | Northern Illinois Normal School. | Ohio University, Athens. | Miami University. | University of North Dakota. | Iowa State Teachers College. | University of Missouri. | Oshkosh Normal School. | Stout Institute. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TECHNICAL SUBJECTS—continued. | | | | | | | | | | | | | |
| Craft work: | | | | | | | | | | | | | |
| Bookbinding | ..... | ..... | ..... | 120 | 60 | 120 | ..... | ..... | ..... | ..... | ..... | 45 | ..... |
| Clay and pottery | ..... | ..... | ..... | ..... | 120 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Leather | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 45 | ..... |
| Drawing: | | | | | | | | | | | | | |
| Mechanical | 200 | ..... | 180 | 240 | 240 | 360 | 216 | 216 | 90 | 192 | 108 | 180 | 81 |
| Machine | 100 | ..... | ..... | ..... | 120 | ..... | ..... | ..... | 180 | ..... | ..... | 180 | ..... |
| Architectural | ..... | ..... | ..... | 120 | 120 | ..... | ..... | ..... | ..... | ..... | ..... | 180 | 167½ |
| Freehand | ..... | ..... | ..... | 120 | 60 | ..... | 36 | ..... | ..... | 60 | 180 | 180 | ..... |
| Design | 100 | ..... | ..... | 240 | 60 | 60 | ..... | 108 | ..... | 60 | ..... | ..... | ..... |
| Blackboard | ..... | ..... | ..... | ..... | 60 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Woodwork design | ..... | ..... | ..... | 120 | 120 | ..... | 36 | 108 | [1] 90 | ..... | ..... | ..... | ..... |
| Printing | 200 | ..... | ..... | ..... | ..... | 360 | ..... | ..... | ..... | ..... | ..... | ..... | (1) |
| Paper and cardboard | 144 | ..... | ..... | ..... | 60 | ..... | ..... | ..... | ..... | 60 | ..... | ..... | 67½ |
| Construction material | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 90 | ..... |
| Forestry | ..... | ..... | ..... | ..... | ..... | ..... | [1] 36 | ..... | ..... | ..... | ..... | ..... | ..... |
| Electives, from studies listed above | ..... | 180 | ..... | ..... | ..... | ..... | ..... | 108 | ..... | 120 | ..... | 1,380 | 375 |

[1] Electives.

## IX.—NATURE AND SCOPE OF VARIOUS SUBJECTS.

The following quotations from statements published in the catalogues of the institutions noted are given to indicate the nature and scope of the instruction in certain subjects.

### HISTORY OF EDUCATION.

A study of the evolution of educational ideals, with special attention to the work of such reformers as have distinctly influenced modern educational practice. A limited study of educational classics is included.

(2 semester hours' credit, Peru (Nebr.) Normal School.)

A thorough and somewhat critical study of educational theory and practice from primitive days to the present time. Great educational movements rather than men engage the attention. The course seeks to trace the development of thought-life and civilization.

(4 hours' credit. University of North Dakota.)

A study of educational conditions and theories of ancient and mediæval times. Special attention devoted to contributions of Locke, Comenius, Rousseau, Pestalozzi, Herbart, and Froebel. Detailed study of educational leaders of nineteenth century. History of education in the United States emphasized during latter part of course.

(1 term, 60 hours. St. Cloud (Minn.) Normal School.)

Educational ideals, ancient and modern; education as related to civilization, educational classics, special educational conditions, national systems of education, current educational problems in the light of the experiences of the past.

(5 term hours, Iowa State Teachers College.)

General survey emphasizing factors contributing to an intelligent conception of present conditions. A typical oriental country, Greece and Rome: early Christians; Middle Ages, Renaissance; Bacon, Comenius, Locke, Rousseau, Pestalozzi, Froebel, Herbart, Spencer, Mann, and modern reformers. Development of schools since renaissance, modern systems, present-day tendencies.

(5 semester hours, Trenton (N. J.) Normal School.)

Introduction to education. An elementary course dealing with general educational problems and scientific methods of solving those problems. Reports on observations in schools required of each member of the class.

(1 major, University of Chicago.)

The aim of this course is to discover causes and trace out important courses of educational development in the past as a basis for the study of present educational problems. (1 major, 60 class hours, Bradley Institute.)

PSYCHOLOGY.

Two terms are devoted to the elements of the subject from the educational point of view. (De Kalb (Ill.) Normal School.)

Essential facts and fundamental laws of human behavior; foundation courses for junior and senior courses in the subject. Topics, physiological basis of education; sensations, perception, association, attention, apperception, memory, imagination, instinct, habit, judgment, emotions, and will.

(Followed by courses in applied psychology and history of education, or by applied psychology and practice teaching. (1 unit, 5 term hours for each course, Sam Houston Normal Institute, Huntsville, Tex.)

The chief topics presented are the physical basis of intellect, character, and skill: The nervous system: sources of human behavior: original tendencies and their modifications: laws and conditions of learning: individual differences: their causes and treatment; measuring results in education: genetic psychology—characteristics, mental and physical, of different stages of child development, scientific method of child study which every teacher should practice.

(10 semester hours, Trenton (N. J.) Normal School.)

Descriptive, historical, analytic; simple experiments without elaborate apparatus; nervous system, the senses, the intellectual powers. Emotion, volition, the esthetic judgment. Lectures, texts, themes, reports, and reviews.

(10 term hours, Iowa State Teachers College.)

The nature of experience; how we gain experience: the nervous system as a machine; forms of reaction; the processes of the conscious life; the use of the conscious process in construction; notions derived from the muscular sense; motor image in construction; importance of true perception in construction; typical judgment in design, mechanical drawing, bench work, forge work, foundry, machine work. Association of ideas, complex ideas; inductive and deductive thinking; application of organized ideas to construction; working according to definite plan, geometry of tool grinding: function of sketch, working drawing, model; mental element in economy of construction, skill, and efficiency; nature of the construction lesson; handling children in the construction class.

(4 semester hours, Oshkosh (Wis.) State Normal School.)

A course in general psychology given with special reference to education and teaching. Discussion, reading, and written work.

(1 major, 60 class hours, Bradley Institute.)

This work is limited to a consideration of principles, fundamental in character, and to the application of those principles in the actual work of teaching. Time does not

permit the study of psychology as a cultural subject. Special attention is given to the psychology of attention, habit, and will. Those principles of pedagogy are considered which may be shown to have a practical application in the teacher's work. Practical exercises are given throughout the course requiring a conscious application of the psychological and pedagogical principles studied.

(45 minutes daily, 18 weeks, Stout Institute.)

### HISTORY OF MANUAL TRAINING.

An extensive study of the development of the manual arts, trade, and industrial education. A brief review of the educational theory of Pestalozzi, Froebel, and other educators. Attention is given to the early apprentice system, guild, manual labor movement, colonial poor laws, Russian and Swedish systems, manual training movement, industrial arts and vocational education, including a study of the Indiana and Federal vocational legislation.

(1 term credit, 12 weeks' course, Indiana State Normal School.)

A study of the place of manual training in education; its relation to the social and psychological life of the child; its place in the curriculum; history of development of manual arts both in Europe and United States.

Lesson plans, observation practice teaching under criticism.

(4 periods weekly, 2 terms, West Tennessee Normal School.)

These courses deal with the history of manual training in the public schools, in relation to the curriculum; manual training systems, courses of study; analysis and presentation of problems in construction, and other questions of importance to the teacher of manual training.

(5 and 3 hours' credit, two terms. Iowa State Teachers College.)

Early educational history; Pestalozzi, effects of his work; education in Germany, France, and England with reference to industrial education and manual training; Della Vos and the Russian system of manual training; Cygneaus, Salamon, and the sloyd movement; beginning and development in the United States; industrial education in the United States and abroad; legislation pertaining to industrial education; comparison of trade, vocational, and technical schools; sources of literature bearing on this phase of public school work.

(3 single periods weekly for 20 weeks,
Kansas State Manual Training Normal School.)

The history of manual training in our own and foreign countries; the sloyd system; the Russian system; trend of manual training, its weakness and strength; how to avoid the weaknesses and build up its strength; point of view in industrial and vocational education; part-time, cooperative, trade, night, and continuation schools.

(3 semester credit hours, Ohio State University.)

The emphasis is placed upon the historical development of industrial education; studies of a specific type of schools, their purpose and organization, and the vocational guidance movement. (45 minutes daily, 18 weeks, Stout Institute.)

The course treats of the purpose, history, organization, and promotion of industrial education and its articulation with the traditional school system and industry.

(1 major, 4 periods weekly, 12 weeks, University of Chicago.)

A brief review of the educational theory and practice of Pestalozzi, Froebel, and other educational reformers; educational handwork in European countries; development of manual training, art instruction, and industrial education in the public schools of the United States; present-day problems relating to the manual arts in both general and vocational education.

(1 major, 5 periods weekly, 12 weeks, Bradley Institute.)

The development of our present manual training work is traced from the time of early European education, showing how it has been influenced by the work of various educators and educational movements in different countries.
(One-half credit, 5 recitations weekly for six weeks, Kent, Ohio, State Normal College.)

A study of the educational conditions that led to the manual training movement and its development. Outside reading, written reports, lectures, and open discussions of problems that arise in organizing the work.
(2 semester hours, Ohio University, Athens, Ohio.)

Evolution of historic manual arts movements in Europe and America.
(1 semester hour, University of Missouri.)

A study is made of the history of the manual training movement in Europe and its development in the United States with reference to its bearing on present problems.
(1 semester hour, University of North Dakota.)

The manual training and industrial education movement.
(2 semester hours, University of Wisconsin.)

This course follows the efforts of the educational reformers in Europe in introducing the manual arts into the schools. The theory and practice of Comenius, Rousseau, Pestalozzi, Fellenberg, and others are reviewed, followed by a study of the more successful work in modern times of Cygneaus, Salamon, and Della Vos. The history of the manual arts in the United States and the development by the various movements which have produced educational and vocational courses will be followed carefully.
(Minor, or one-half credit, Illinois State Normal University, Normal.)

A brief history of the development of industrial education, including the present status; theory, educational, social, and economic; courses of study: administration of manual training and vocational school work; types of vocational schools—prevocational, trade continuation, cooperative, technical high, vocational guidance.
(3 semester hours, Pennsylvania State College.)

History of manual training will be given the first quarter.
(5 term hours, 12 weeks, Northern Normal and Industrial School, Aberdeen, S. Dak.)

The history and development of the practical arts in education, including the manual arts, home economics, industrial education, and vocational guidance. Brief reference to attitude of ancient nations toward the practical in education. emphasis placed on educational reformers; consideration of modern tendencies in education.
(3 semester hours' credit, Miami University.)

A general course covering a brief history of the development of industrial and vocational education in Europe and America. Detailed study of typical examples of vocational education in the elementary and secondary field, including the problem of vocational information or direction. Especial attention to Iowa conditions.
(2 semester hours, State University of Iowa.)

## X.—PRACTICE TEACHING.

The results of an inquiry concerning facilities for practice teaching and the character of supervision available in certain institutions may be summarized as follows:

1. Pupils in classes taught by practice teachers come from:
   (*a*) Model or training schools in 12 cases.
   (*b*) Public schools not connected directly with the normal school or college in 10 cases.
   (*c*) From both model school and the public school in 6 cases.
   (*d*) Private school in 5 cases.
   (*e*) Parochial school in 1 case.

2. Teaching of class goes on:
   (a) In the training or model school shop in 16 cases.
   (b) In the public school in 8 cases.
   (c) In both (a) and (b) in 4 cases.
3. Teaching is done under supervision of:
   (a) Training school supervisor, 3 cases.
   (b) Head or member of manual arts department faculty, 21 cases.
   (c) City supervisor of manual training, 6 cases.
4. Course of study, equipment, supplies, etc., under direction of:
   (a) Department of manual arts, 18 cases.
   (b) Department of education, 7 cases.
   (c) City supervisor, 4 cases.
5. Practice teaching is done in one or more lines of work:
   (a) One line, 2 cases.
   (b) Two lines, 10 cases.
   (c) Three lines, 4 cases.
   (d) Four lines, 1 case.
   (e) Six lines, 1 case.
   (f) Eight lines, 1 case.

Of the lines of work in which practice teaching is done, benchwork in wood is most commonly found. Next in order are mechanical drawing, wood-turning, and lastly the common branches.

6. Number of lessons actually taught:
   (a) 12 in 1 case.
   (b) 24 in 3 cases.
   (c) 36 in 4 cases.
   (d) 40 to 60 in 4 cases.
   (e) 90 to 96 in 2 cases.
   (f) 112, 126–180 in 1 case.
7. Recognition of teaching experience for credit in substitution for practice teaching:
   No, 17 cases.
   Yes, 3 cases.
   Partial, 1 case.
   Upon examination, 2 cases.
8. Character of lesson plan prepared by student:
   Outline, 3 cases.
   Detailed, 12 cases.
   Written, 7 cases.
   Project plan, 2 cases.
9. Observation work.
   Briefly, 6 to 8, 8 to 10 lessons.
   One term (12 weeks), 4 cases.
   One semester (18 weeks), 2 cases.

NOTE.—This observation work is done (a) preparatory to teaching, (b) paralleling methods courses and teaching, (c) subsequent to practice work. Reports concerning value of this feature of the work vary from "none" to "very great."

## XI.—TYPICAL THREE-YEAR COURSES OF STUDY.

**The following outlines are arranged to show the number and nature of the subjects included in three-year courses offered in two institutions. The numeral following a subject indicates hours per week.**

OSHKOSH (WIS.) NORMAL SCHOOL.

| *First Year.* | | *Second Year.* | | *Third Year.* | |
|---|---|---|---|---|---|
| Psychology | 2 | History of manual training | 5 | Prescribed: | |
| English composition | 3 | Courses of study | 5 | Literature and themes | 5 |
| Mechanical drawing | 10 | School management | 2 | History of typical industries | 5 |
| Wood work and wood turning | 10 | Practice teaching | 3 | Chemistry and physics of typical industries | 10 |
| Forging | 10 | Advanced cabinet making | 15 | | |
| Freehand drawing | 2 | Crafts and applied design | 5 | Electives: | |
| Applied design | 5 | Vocational mathematics | 5 | Seven (7) hours of class work daily, from the following— | |
| Psychology | 2 | Organization of manual training | 5 | Mathematics. | |
| English composition | 3 | Practice teaching | 3 | History. | |
| Mechanical drawing | 10 | Machine shop | 15 | Physics. | |
| Cabinet making | 10 | Craft work | 5 | Chemistry. | |
| Pattern making | 2 | Mechanical drawing and machine design | 6 | Manual arts. | |
| Foundry practice | 10 | Construction and details | 6 | | |
| Freehand drawing | 2 | Ten weeks commercial shop experience. | | | |
| Applied design | 5 | | | | |

BRADLEY POLYTECHNIC INSTITUTE.

| *First Year.* | | *Second Year.* | | *Third Year.* | |
|---|---|---|---|---|---|
| History of education | 5 | Vocational woodwork or metal work | 30 | History of manual arts | 5 |
| Wood work | 10 | Agricultural drafting or machine drafting | 10 | Teaching mechanical drawing | 5 |
| Mechanical drawing | 10 | | | Design | 10 |
| Metal work | 10 | | | Teaching woodwork | 10 |
| English composition | 5 | Vocational woodwork or metal work | 20 | Vocational woodwork or metal work | 10 |
| Wood finishing | 10 | Economic history | 5 | | |
| Upholstery | 10 | Architectural drafting or machine drafting | 10 | Teaching manual arts | 5 |
| Freehand drawing | 10 | | | Design or wood carving | 10 |
| Sheet metal work | 10 | | | Woodwork design | 10 |
| | | | | Wood or metal shopwork | 10 |
| Psychology | 5 | Pattern making | 10 | English composition | 5 |
| Carpentry, or wood turning | 10 | Vocational wood work or metal work | 20 | Furniture making | 10 |
| Mechanical drawing | 10 | Architectural drafting or machine drafting | 10 | Organization of manual arts | 10 |
| Art metal work | 10 | | | | |

## XII.—FOUR YEAR CURRICULA LEADING TO THE B. S. DEGREE.

The following outlines are arranged to show the number and nature of the subjects included in the four-year courses offered in typical institutions:

OHIO STATE UNIVERSITY.

*First year.*

| *First semester.* | Hours. | *Second semester.* | Hours. |
|---|---|---|---|
| English | 2 | English | 2 |
| Mathematics | 3 | Mathematics | 3 |
| Arts | 1 | Art | 2 |
| Art | 2 | Shopwork | 2 |
| Engineering drawing | 4 | Engineering drawing | 3 |
| Foreign language | 4 | Foreign language | 4 |
| Physical education | 1 | Physical education | 1 |
| Military drill | 1 | Military drill | 1 |

*Second year.*

| | | | |
|---|---|---|---|
| English | 3 | English | 3 |
| Foreign language | 4 | Foreign language | 4 |
| Psychology | 3 | Psychology | 3 |
| Shopwork | 3 | Shopwork | 3 |
| Shopwork | 2 | Shopwork | 2 |
| Military drill | 1 | Military drill | 1 |
| Elective | 2 or 3 | Elective | 2 or 3 |

*Third year.*

| | | | |
|---|---|---|---|
| Chemistry or physics | 4 | Chemistry or physics | 4 |
| Sociology | 3 | Sociology | 3 |
| Psychology | 2 | Psychology | 3 |
| Manual training | 2 | Manual training | 2 |
| Shopwork | 3 | Shopwork | 3 |
| Elective | 2 to 4 | Elective | 3 or 4 |

*Fourth year.*

| *First semester.* | Hours. |
|---|---|
| History of education | 3 |
| Manual training | 3 |
| Principles and practice | 3 |
| School administration | 3 |
| Elective | 3 to 6 |

| *Second semester.* | Hours. |
|---|---|
| History of education | 3 |
| Manual training | 3 |
| Principles and practice | 3 |
| Elective | 6 to 9 |

STOUT INSTITUTE.

| *First year* | Hours. |
|---|---|
| Shopwork and drawing | 20 |
| Psychology | 5 |
| English composition | 5 |
| English, directed readings | 1 |
| American history | 5 |
| Military drill | R |
| Gymnastics | R |
| Total | 36 |

| *Second year.* | Hours. |
|---|---|
| Shopwork and mechanical drawing | 20 |
| Organization of industrial arts | 2 |
| Teaching industrial arts | 2 |
| Observation and practice teaching | 3 |
| English, directed reading | 2 |
| Public speaking | 2 |
| Hygiene and sanitation | 1 |
| Citizenship | 2 |
| Military drill | R |
| Gymnastics | R |
| Total | 36 |

The 20 hours of shopwork in the first year will be in three or more of the following subjects, to be determined by the director:

| | | |
|---|---|---|
| Elementary woodwork. | Mechanical drawing. | Printing. |
| Carpentry. | Electrical work. | Architectural drawing. |
| Bricklaying. | Wood turning. | Sheet-metal work. |
| | Plumbing. | |

The 20 hours of shopwork in the second year will be [illegible] or more of the following subjects, to be determined by the director:

| | | |
|---|---|---|
| Millwork. | Machine work. | Pattern making. |
| Wood finishing. | Gas engines and automobile repairs. | Foundry work. |
| Forging. | Cabinetwork. | Machine drawing. |

| *Third year.* | Hours. |
|---|---|
| Shopwork, drawing, and design | 10 |
| Advanced psychology | 2 |
| Vocational education | 2 |
| English | 3 |
| Modern history | 3 |
| Modern industries | 2 |
| Mathematics | 4 |
| Sociology | 3 |
| Physics | 5 |
| Total | 34 |

| *Fourth year.* | Hours. |
|---|---|
| Shopwork and drawing | 10 |
| Administrative problems | 2 |
| Strength of materials | 3 |
| Industrial chemistry | 4 |
| Economics | 5 |
| English | 2 |
| Industrial history | 3 |
| Principles of education | 3 |
| Thesis | 2 |
| Total | 34 |

The hours indicated are semester hours required. One hour of recitation or two hours of shop or laboratory work, with such outside preparation as may be necessary once a week for 18 weeks, constitute a semester hour.

The 10 hours required shopwork and drawing in the third year and 10 hours in the fourth year will be a continuation of the shopwork in the first and second years.

In the fourth year five hours of additional shopwork may be substituted for the same number of hours of other work, when approved by the director.

MIAMI UNIVERSITY.

*First year.*

| *First semester.* | Hours. |
|---|---|
| Object drawing and design | 1 |
| Mechanical drawing | 2 |
| Psychology | 3 |
| Rhetoric and composition | 3 |
| Woodworking | 3 |
| Trigonometry | 3 |
| Physical education | 1 |

| *Second semester.* | Hours. |
|---|---|
| Object drawing and design | 1 |
| Mechanical drawing | 2 |
| Psychology | 3 |
| Rhetoric and composition | 3 |
| Woodworking | 3 |
| Shop mathematics | 4 |
| Physical education | 1 |

*Second year.*

| *First semester.* | Hours. |
|---|---|
| General chemistry | 4 |
| Constructive design | 1 |
| Descriptive geometry | 2 |
| History of manual arts | 3 |
| Cabinetmaking | 3 |
| Wood turning | 2 |
| Physical education | 1 |

| *Second semester.* | Hours. |
|---|---|
| General chemistry | 4 |
| Constructive design | 4 |
| Descriptive geometry | 2 |
| Cabinetmaking | 3 |
| Pattern making | 2 |
| Physical education | 1 |
| Elective | 3 |

*Third year.*

| *First semester.* | Hours. |
|---|---|
| Architectural drawing | 2 |
| Principles of teaching | 3 |
| Paper and cardboard construction or sheet-metal work | 2 |
| Concrete construction | 2 |
| Physics | 4 |
| Sociology | 3 |

| *Second semester.* | Hours. |
|---|---|
| Topographical drawing | 2 |
| Special methods in industrial arts | 3 |
| Bookbinding or art metal work | 2 |
| Frame building construction | 2 |
| Physics (freshman) | 4 |
| Sociology | 3 |

*Fourth year.*

| *First semester.* | Hours. |
|---|---|
| Machine design | 2 |
| Pottery or printing | 2 |
| Forging | 2 |
| Teaching industrial education | 2 |
| Labor problems | 3 |
| School organization in secondary schools | 3 |
| Machine design | 2 |

| *Second Semester.* | Hours. |
|---|---|
| Pottery or printing | 2 |
| Bench metal work | 2 |
| Organization and administration of vocational education | 3 |
| Sociology in rural communities | 3 |
| Teaching industrial education | 2 |

Students in industrial education are advised to spend one or more summers during their course in practical work in the industries. The demand for teachers who have had industrial work in commercial shops is increasing each year.

The students may make any one of the following combinations with the course in industrial education: Industrial education and (*a*) mathematics, (*b*) physics, (*c*) agriculture, or (*d*) physical education.

UNIVERSITY OF WISCONSIN.

*First year.*

| *First semester.* | Hours. |
|---|---|
| English | 3 |
| Language or science and mathematics | 3–5 |
| History or mathematics | 3 |
| Drawing (freehand or mechanical or both) | 3–6 |
| Electives | 3 |
| Total | 15–17 |

| *Second semester.* | Hours. |
|---|---|
| English | 3 |
| Language, or science and mathematics | 3–5 |
| History or mathematics | 3 |
| Drawing (freehand or mechanical or both) | 3–6 |
| Electives | 3 |
| Total | 15–17 |

*Second year.*

| *First semester.* | Hours. |
|---|---|
| Language or science and mathematics | 3–5 |
| History or mathematics | 2–5 |
| Drawing (if not taken in freshman year) | 3 |
| Manual arts: | |
| Freehand drawing (advanced) | 3–6 |
| Elementary woodwork | |
| Wood turning | |
| Care of machines | |
| Electives | 4–6 |
| Total | 15–17 |

| *Second semester.* | Hours. |
|---|---|
| Language or science and mathematics | 3–5 |
| History or mathematics | 2–5 |
| Drawing (if not taken in freshman year) | 3 |
| Manual arts: | |
| Industrial arts design | 3–6 |
| Advanced woodwork | |
| Wood finishing | |
| Pattern making | |
| Electives | 4–6 |
| Total | 15–17 |

### Third year.

| First semester. | Hours. |
|---|---|
| Psychology, history, or mathematics | 2–5 |
| Education | 2–3 |
| Manual arts: | |
| Public school drawing practice | 5–7 |
| Decorative metal | |
| History and applied design | |
| Design seminary | |
| History and literature of manual arts | |
| Organization and administration | |
| Industrial shop courses | |
| Clay and pottery | |
| Electives | 4–7 |
| Total | 15–17 |

| Second semester. | Hours. |
|---|---|
| Psychology, history, or mathematics | 2–5 |
| Education | 2–3 |
| Manual arts: | |
| Public school drawing methods | 5–7 |
| Public school drawing practice | |
| Decorative metal | |
| History and applied design | |
| Design seminary | |
| Vocational education and guidance | |
| Industrial shop courses | |
| Clay and pottery | |
| Electives | 4–6 |
| Total | 15–17 |

### Fourth year.

| First semester. | Hours |
|---|---|
| Thesis | 2 |
| Education | 3–4 |
| Manual arts: | 8–11 |
| Clay and pottery or decorative | |
| Metal (advanced) | |
| Design seminary | |
| Illustration | |
| Teaching and supervision | |
| Seminary in manual arts | |
| Observation and practice teaching | |
| Industrial shop courses | |
| Electives | 3 |
| Total | 13–17 |

| Second semester. | Hours |
|---|---|
| Thesis | 2 |
| Education | 3–4 |
| Manual arts: | 8–11 |
| Clay and pottery or decorative metal (advanced) | |
| Design seminary | |
| Illustration | |
| Teaching and supervision | |
| Primary handwork | |
| Seminary in manual arts | |
| Special methods | |
| Industrial shop courses | |
| Electives | 3 |
| Total | 13–17 |

### General summary of requirements.

| | Hours. |
|---|---|
| English | 6 |
| Language, or science and mathematics | 20 |
| History | 10 |
| Psychology and education | 10–18 |
| Drawing | 9–12 |
| Manual arts | 32–40 |
| Electives | 10–33 |
| Major: Minimum | 40 |
| Minor: Minimum | 17 |

## UNIVERSITY OF MISSOURI.

| Department. | Course number. | Course title. | Hours credit, semester— I. | Hours credit, semester— II. |
|---|---|---|---|---|
| **FRESHMAN YEAR.** | | | | |
| English | 1a or 1b | English composition and rhetoric | 3 | 3 |
| History | 1a | European history | 3 | |
| Manual arts | 1a or 7a | Woodwork | 2 | |
| Manual arts | 1b or 7b | Mechanical drawing | | 2 |
| Physical education or military science. | 1 | Physical training | 0 | 0 |
| Foreign language | | Elective | 5 | 5 |
| Physical science | | Elective | | 5 |
| | | | 15 | 15 |
| **SOPHOMORE YEAR.** | | | | |
| Mathematics | 3a | Trigonometry | 5 | |
| Sociology | 1a | Elementary sociology | 5 | |
| Preventive medicine | 1b | Preventive medicine | | 2 |
| Manual arts | 2a | Metalwork | 2 | |
| Theory and practice of art | 2b | Introduction to art | | 5 |
| Education | 102a | Educational psychology | 4 | |
| Biology science | | Elective | | 5 |
| Elective | | | | 3 |
| | | | 16 | 15 |

UNIVERSITY OF MISSOURI—Continued.

| Department. | Course number. | Course title. | Hours credit, semester— I. | Hours credit, semester— II. |
|---|---|---|---|---|
| **JUNIOR YEAR.** | | | | |
| Manual arts | 3b | Pattern making | | 2 |
| Manual arts | 4a and 14b | Machine work | 2 | 2 |
| Manual arts | 5a | Tools, materials, and shop practice | 1 | |
| Manual arts | 8a | Machine drawing | 3 | |
| Mechanical drawing | 4a | Architectural drawing | 2 | |
| Education | 120 | History of education | 2 | 2 |
| Education | 130a | Theory of teaching | 3 | |
| Education | 140b | Teaching of manual arts | | 2 |
| Manual arts | 190b | Elementary millwrighting | | 1 |
| Elective | | | 2 | 6 |
| | | | 15 | 15 |
| **SENIOR YEAR.** | | | | |
| Education | 160b | School economy | | 2 |
| Education | 165f | Administration of manual arts | 2 | |
| Education | 180 | Practice teaching | 3 | 3 |
| Manual arts | 180b | History of manual arts | | 1 |
| Elective in education | | | 1 | |
| Elective | | | 9 | 9 |
| | | | 15 | 15 |

PENNSYLVANIA STATE COLLEGE.

*First year (in engineering).*

| *First semester.* | Credits. | *Second semester.* | Credits. |
|---|---|---|---|
| Descriptive geometry | 3 | General chemistry | 6 |
| Modern language | 3 | Mechanical drawing | 3 |
| Freehand drawing | 1 | Modern language | 3 |
| Trigonometry | 5 | Analytic geometry | 5 |
| Military drill and gymnasium | 2 | Military drill and gymnasium | ½ |
| Composition | 3 | Argumentation | 3 |
| Wood turning and metal work | 1 | Woodworking for elementary schools | 1 |
| Woodworking for elementary schools | 2 | | |

*Second year.*

| | | | |
|---|---|---|---|
| Mechanical drawing | 1 | Modern language | 3 |
| Modern language | 3 | Design | 2 |
| Foundry practice | 2 | Shop problems | 3 |
| Forging | 2 | Wood turning | 2 |
| Elements of machinery | 2 | Industrial materials | 2 |
| Construction and design | 2 | Elements of machinery | 2 |
| Military drill | 1 | Military drill | 1 |
| Mechanics and heat | 3 | Oral composition or English literature | 3 |
| Advanced composition | 3 | | |
| Mechanical drawing | 1 | | |

*Third year.*

| | | | |
|---|---|---|---|
| Working drawings | 2 | Principles of education | 3 |
| History of education | 3 | American economic history | 3 |
| English economic history | 3 | Art metal work | 2 |
| Furniture design | 1.5 | Industrial materials | 2 |
| Machine-shop practice | 1 | Machine-shop practice | 2 |
| Machine-shop organization | 3 | Furniture construction | 2 |
| Time and motion study | 1 | Practice teaching of woodwork | 1 |
| Psychology | 3 | Logic | 3 |
| Electives | 3 | Electives | 2 |

*Fourth year.*

| | | | |
|---|---|---|---|
| Principles of economics | 3 | Secondary education | 3 |
| Class teaching and management | 3 | Thesis | 2 |
| Pattern making | 2 | Organization and equipment of industrial education | 2 |
| Principles of industrial education | 3 | Clay and cement work | 2 |
| Practice teaching of wood turning | 1 | Practice teaching of pattern making | 1 |
| Practice teaching of forging | 1 | Vocational woodwork or Vocational metal work | 3 |
| Vocational woodwork or Vocational metal work | 3 | Municipal government | 3 |
| Practice teaching or Foundry practice | 11 | Electives | 8 |
| Industrial management | 3 | | |

## INDIANA STATE NORMAL SCHOOL.

### *Freshman Year.*

| *First term.* | *Second term.* | *Third term* |
|---|---|---|
| Shopwork. | Shopwork. | Shopwork. |
| *Mechanical drawing. | *Freehand drawing. | *Mechanical drawing. |
| *Applied arithmetic. | *Applied algebra. | *Applied geometry. |
| English. | English. | English. |

### *Sophomore Year.*

| | | |
|---|---|---|
| Shopwork. | Shopwork. | Shopwork. |
| *Mechanical drawing. | History of education. | History of education. |
| *Applied trigonometry. | *Mechanics. | *Typical industries. |
| Psychology. | Psychology. | †Vocational psychology. |

### *Junior Year.*

| | | |
|---|---|---|
| Shopwork. | Shopwork. | Shopwork. |
| *Architectural drawing, or | *Architectural drawing, or | *Architectural drawing, or |
| *Machine design. | *Machine design. | hygiene and sanitation. |
| General chemistry. | General chemistry. | *Applied chemistry. |
| *Industrial history. | Economics. | Economics. |

### *Senior Year.*

| | | |
|---|---|---|
| Shopwork. | Shopwork. | Shopwork or wood finishing. |
| *Constructive design. | Installation of machinery. | †Special methods in teaching shop subjects. |
| *Applied chemistry. | *Applied physics. | *Applied physics. |
| †Theory of industrial and vocational education. | †Organization and management of shop courses. | †Practice teaching. |

## BRADLEY POLYTECHNIC INSTITUTE.

1. The following curriculum gives a broad view of the manual arts field, as well as considerable emphasis to general education. It is designed for teachers, who will be expected to offer a combination of academic and technical subjects. Upon consultation with the adviser, students will choose their electives in such a manner as will prepare them for teaching one or more high-school academic subjects in addition to manual arts.

The curriculum includes three main divisions: (1) Required technical subjects, 16 majors; (2) required general and professional subjects, 22 majors; (3) electives, 10 majors.

The electives are taken in the second, third, and fourth years, from the following subjects:

| | | |
|---|---|---|
| Biology. | English. | Mathematics. |
| Chemistry. | History. | Physics. |
| Education. | Languages. | Coaching athletics. |

*Approved related technical subjects, in which 12 credits are required.
†Special professional subjects, in which 5 credits are required. Students should consult with the head of the department of industrial arts as to the required 12 shop credits and the order in which they should be taken up each term, who will outline the work by terms according to the particular needs of each student. Individual programs will be made for those who enter upon the course with advanced standing and for those who, for good reason, find it impracticable to follow the course term by term as outlined. Special programs will also be made for students who may be in attendance during the summer quarters. Students enrolling in the industrial arts course or any of the special vocational courses are strongly urged to observe carefully the suggested outlines in planning each term and year's work, especially the prescribed work, and under no circumstances to permit the required subjects to accumulate for the latter part of the course.

The remainder of the curriculum is as follows:

| *Technical subjects.* | *General and professional subjects.* |
|---|---|
| | *First year.* |
| Mechanical drawing.<br>Freehand drawing.<br>Woodworking.<br>Forging.<br>Sheet metal work.<br>Art metal work. | English composition.<br>Economic history.<br>Shop mathematics.<br>Physical training. |
| | *Second year.* |
| Architectural drawing.<br>Theory of design.<br>Machine drawing.<br>Pattern making. | Chemistry.<br>Mathematics.<br>Physical training. |
| | *Third year.* |
| Interior decoration.<br>Woodwork design.<br>Furniture making. | Physics<br>Psychology.<br>History of education.<br>Advanced English composition.<br>Physical training. |
| | *Fourth year.* |
| | History of manual arts.<br>Equipments.<br>Administration of manual arts<br>Vocational guidance.<br>Social science.<br>Teaching manual arts.<br>Teaching mechanical drawing.<br>Teaching woodworking.<br>Practice teaching. |

II. A curriculum giving special emphasis to technical courses and related science and mathematics for the preparation of teachers of drafting in the larger city high schools and vocational schools.

| *Required technical, 27 majors.* | *Required general and professional, 22 majors.* |
|---|---|
| | *First year.* |
| *Mechanical drawing.<br>Free-hand drawing.<br>Woodworking.<br>Forging.<br>Sheet metal.<br>Art metal. | English composition.<br>Economic history.<br>Shop mathematics.<br>Physical training. |
| | *Second year.* |
| Pattern making.<br>Foundry.<br>Woodworking machinery.<br>Machine shop (one major)<br>Free-hand drawing. | Chemistry (two majors).<br>Mathematics.<br>Descriptive geometry.<br>Physical training. |
| | *Third year.* |
| Architectural drafting.<br>Machine design<br>Machine shop (one major). | Physics 2.<br>Psychology.<br>History of education.<br>Advanced English composition.<br>Physical training. |

*Shop, drawing, and science; double periods daily.

*Fourth year.*

| *Required technical, 27 majors.* | *Required general and professional, 2 majors.* |
|---|---|
| Theory of design. | History of manual arts. |
| Architectural drafting. | Equipments. |
| Machine drawing. | History of architecture. |
| Furniture making. | Social science. |
| | Teaching manual arts. |
| | Teaching mechanical drawing. |
| | Practice teaching. |

Other curricula offered at Bradley Polytechnic Institute include the following, four years in length:

1. A curriculum designed for teachers in (*a*) junior high schools, (*b*) agricultural high schools, and (*c*) automobile repair, giving opportunity for electives from the available technical courses, enabling the teacher to specialize in automobile repair, or to prepare to teach from two to four lines of industrial work.

2. A curriculum for prospective teachers of woodworking in technical high schools and vocational schools.

3. A curriculum emphasizing technical work in shop practice, related drawing, mathematics, and science for teachers of metal working in the larger city high schools and vocational schools.

4. A curriculum for prospective supervisors and administrative officers of industrial education. Candidates must present evidence of (*a*) two years of approved study in manual arts and academic courses in college or normal school, (*b*) general fitness for supervisory work, and (*c*) actual teaching experience in technical subjects.

## XIII.—THE GENERAL PROBLEM.

A study such as this shows considerable variation in the subjects actually included in the curricula set up for prospective teachers. There is, however, a growing tendency toward a common standard, and the two-year courses are coming to have many elements in common both as to subject matter and methods of procedure. For example, in many institutions the stock subjects in education, such as psychology and history of education are treated in much the same way. English composition, woodworking, and mechanical drawing are likewise treated much alike by the various schools. Practice teaching varies considerably as to character, length of time required, and conditions under which the teaching is done. State legislation is taking hold of this matter and greater emphasis is certain to be placed upon this phase of the teacher's preparation.

One tendency in the field of general education is becoming noticeable in the special field under consideration. More and more the two-year normal graduate is finding his field of work in the grammar grades or the smaller high schools, while the teachers for the larger high schools are being trained at the colleges and universities in increasing numbers. It is to be expected, therefore, that high-school positions will be held generally by men with the training represented by the bachelor's degree, while the normal-school graduate more often is located in the elementary school. This tendency toward four-

year programs is naturally moving more rapidly in the colleges and universities than in the normal schools, where the facilities for offering a four-year program do not exist. A study of the four-year plans outlined on the foregoing pages shows the most recent developments.

The universities usually administer these courses either (1) in the college of education, thus making use of the model (high or elementary) school facilities, or (2) in the college of engineering, utilizing the engineering shops.

In the former case the institution is apt to place much emphasis upon education courses and such work as usually receives consideration in the average college course, thus giving a meager opportunity for actual shop practice. The latter oganization places the emphasis upon engineering courses in science and mathematics, which very often are theoretical and unrelated to the work in hand. In neither case is prime consideration given to the man being trained, with reference to his having, or acquiring, the skill required as the basis for effective teaching.

The supply of qualified teachers will not meet the demand for some time to come, because (1) the number needed is rapidly increasing and (2) the means of preparation are limited; again, the conception of what these teachers should be is not yet clear to many school executives. An analysis of the problems must make evident the need of one with *ability to teach the things he himself can actually do*. This means that he can not be an individual, school trained, exclusively, whose knowledge and skill in shop courses are such that skilled workmen will not consider it of value. The requirements laid down by the Smith-Hughes Act for the qualifications of teachers make impossible the continued employment of teachers whose preparation does not include sufficient practice in the line of work to be taught to give him the degree of skill, resourcefulness, and knowledge possessed by a workman of journeyman rank.

On the other hand, this law has opened up a new danger in that many school officials are swinging to the opposite extreme in their belief and practice concerning teachers for technical work. It is becoming all too common to "pick up" a mechanic from the trades, whose only merit may lie in the fact that he draws a skilled-workers wages. With the specialization of modern industry, and the haphazard method of securing employment as a mechanic, it is not an easy matter to find by the most diligent search a man of the type represented by the old master workman who taught his trade to one or more apprentices. Having found this man, we still have the problem of training him to be an effective teacher with the spirit, the point of view, and the attitude toward education, toward industry, and life in general which we need in leaders of boys and young men.

If the school has not succeeded in properly preparing its prospective teachers on the technical side, it is equally true that industry organized for the production of articles of commercial value can not at the same time produce teachers for the schools of the nation. Clearly, then, there must be a new attempt at a solution of the problem. Several of the four-year curricula given in this paper are recent attempts of this kind.

The program of the State College of Pennsylvania is clearly the result of an engineer's analysis of the problem, and the curriculum has many elements in common with the engineering curricula of that institution. The Stout Institute program is a recognition of the junior high-school movement, and as such is most appropriate in its service to these high schools becoming common throughout the country. As a rule the university programs (Wisconsin and Missouri) cover in brief fashion a variety of shop and drawing courses, with an insufficient amount of time spent upon any one line to make more than a mere novice of the student. The programs at Bradley Institute have been developed with the kind of positions open to the graduate in mind. Since an adequate supply of competent men can not be had from industry, and those that do come are not ready to teach, greater emphasis is placed upon technical work of a practical character. On the other hand, there is a body of subject matter of general and professional character which should be common to any course.

Finally, there is no valid reason why teacher training courses for the technical subjects should not be made up of elements selected because of their contribution to the end or ideal in mind. This means that tradition need not be followed slavishly in organizing the plan. There is surely no reason why two years of foreign language should be made part of the requirement when the time may be spent to greater advantage on lines of work directly contributing to effective teaching.

A report such as this is not the place to theorize at length, yet the student of catalogues and announcements of curricula can not escape the feeling that teacher-training institutions need to make a more thorough analysis of the work industrial teachers must do and to arrange curricula which directly and specifically fit individuals for their work. Only by such procedure can an adequate supply of teachers who know their subject and who can teach what they know to others be assured for the schools now established and for those sure to be needed in the near future.

O