Civil War, and records and reports of

Bach student is allowed the privilege of drawing out books for a period of two weeks. During the past year the daily issue of books in this manner has aver-

aged S. exclusive of books that were read and used without being taken from the library. There are chairs and tables in the room to scat 80, yet on most days there were not enough to accomodate all the students who wished to use the

an the scucents who wished to use the books and magazines. No special ap-propriation is made for the maintenance of the library nor for the purchase of new books, but by using small amounts from the various finds a few new books

the students.

W. C. Langfitt, of the Army, the engineer of the district. They are going north to make a thorough study of the South-

age locations for new buoys may be a

RAILROAD TO NEHALEM.

Proper Route Is From Portland-Re-

sources of the Country.

PORTLAND, June IL-(To the Editor.) —"The day will soon come when some man of brains will take hold of Neha-lem Bay and its vast resources and carry them to Portland." These were the words

of Major McNelll. in 1896, when receiver of the O. B. & N. Company, after exam-ining in person Nehalem Hay. Business required me last week to travel, mostly

north, south, east or west, ex-

ept from the sea, it has a tributary ountry possessing 20,000,000,000 feet of number-spruce, cedar and fir; extensive

## AN INDUSTRIAL TRAINING

HOW IT IS PROVIDED FOR AT ORE GON AGRICULTURAL COLLEGE.

Various Branches Pursued by Both Men and Women-Complete Equipment of the Institution

CORVALLIS, June 21.—Of interest to the citizens of Oregon, to the members of the Oregon Grange and to lovers of industrial education, is the following review of the work and progress during the past year of the Oregon Agricultural

Mechanic and Electric Engineering At the beginning of the year the me-chanical department was transferred to the new mechanical balk, which was built at a cost of \$25,000 and furnished with about \$5000 worth of machinery and apparatus. The equipment consists, in part, of one 24x24-cnch from planer, one universal milling machine, one universal fool-grinder, one radial drill drill, one 30-inoh engine lathe, one 18-inch engine lathe, three 14-inch engine lathes, one 18-Inch sharpen one emery grinder, two 10-inch speed lathes, 12 bench vises and nu-merous small tool, such as hammers,

ohisels, drille, reamers, taps, dies, etc. The blacksmith shop contains 20 station ary forges operated by an electric motor fan. Each forge is provided with anvil, hammers and tongs. The shop also con-tains two vises, a swedge block and a full set of swedges, fullers and heading

The woodshop contains one 4-inch four The woodshop contains one 4-inch four-sided moulder, one 24-inch surface planer, one iron saw table with rip and cut-off maws, one band saw, one jig saw, one 25-inch pattern-maker's lathe, one post bor-ing machine, four 12-inch wood-turning lathes and 20 hand benches each equipped with a set of tools consisting of saws, planes, chinels and other small tools. is supplied by a 10-horse-power

The power-house contains a 54-inc power high-speed automatic engine, belted direct to two 124-kilowat generators. These generators operate the motors in the machine shop, woodshop and black-smith-shop and also furnish lights for the

ollege buildings.
The steam electrical and heating plant of the college furnish opertunity for much valuable experimental work in en-gineering, such as tests of bollers, engines, dynamos, motors, fans, pumps and The department is supplied with indicators, gauges, plantmeters and other instruments to facilitate this work. A Richle testing machine of 59,000 pounds capacity, operated by an independ-ent motor, affords means of testing the strength of metals, woods, stone or brick.

#### Household Science.

Some 150 women students constituting the household acience department, enter college on the same intellectual footing with the men. Together the battle with the same problems in algebra; wander with delight through Arcady and the Isles of Greece and history; stroll hand in hand over the pone asinorum-geomerry—and scale the same ladder leading to the heights of philosophy; and it s only when what is known as industrial work begins that their paths diverge.

As the catalogue states, self-interest, and public interest, makes it apparent to every intelligent person how greatly in need are subjects pertaining to the home of being "touched to fine issues"; hence their introduction as studies into college

We have been reviled as "the most common schooled, and least cultivated among all civilized nations," and this largely through our deplorable indifferto, and ignorance of, the commo

The home as we find it today has scant warrant that anything born of its teach-ing is worth while to impart, yet the problem grows of how to get better results, how to lessen the labor of farm ers' wives, the washer-woman, the cook, the boarding-house keeper, the city mis-sionary, the school teacher, the woman

The solution requires something mor than the knitting of the brow over the-ories; there must be actual testing of those theories by practice in the college laboratory, if they are to have value and The precious acquisition of the scholar who knows must supplemented by that of the artist who

Living is the art of arts. The cours in household science is for the instruction of housekeepers that they may become better cooks, better seamstresses and bet ter thinkers, and make better homes. This is done. The ladies who have grad-unted from this course are so popular that the supply of graduated housekeep. ers has never equalled the demand for them; and it may be incidentally stated, as shown by the records, that such a thing as a divorce case is absolutely unknown to the homes of the ladies who have taken this course.

## Military Department.

Military drill cultivates manly spirit ready and implicit obedience, respect for authority and self-restraint. The course prepares the cadet to hold a commission as a company officer in the National Guard or Volunteer Army. The new ar-mory contains a drillroom Text30 feet in extent, on office and recitation room, and suitable rooms for storing guns and other ordnance. Two hundred Springfield cawith equipments, two light artillery field pieces, and a Eberal allowassee of blank and ball cartridges are furnished by the Ordnance Department, United States Army. The college has purchased the necessary band instru-ments, swords bugles, colors and signal apparatus for the thorough equipment of department.

A novel feature of this department this year was the encampment held a few miles west of the college. All were provided with tents and regular army tions, consisting of hard tack, black cofcanned beef and tomatoes and baked At the encampment, W. R. Dilley won honors as the first targateer hav ing scored 23 out of a passible 25, dis-tance 100 yards, without rest.

## The Experiment Station.

The station bears an important relation to the college, as the scientific investiga tions conducted at the station stre ort the instruction given in the class.

Aside from the original investiga tions of an economic significance to agri culture, the work of the station daily object lessons in good modern farm

About 100 acres of the college farm are devoted to scientific and experiments farming. Animal husbandry is an important feature of station work. For brench of the work Shorthorn and Jer-sey cattle. Cotswold and Shropshire sheep, and Berkshire swipe are maintained. Among these animals can be found of rare individual excellence, thus offering to the student in agriculture an oppor-tunity to study the highest types of the re-

Extensive field trink are made in the grasses and forage plants, which are utilized in various feeding experiments conducted for the purpose of determining their value as stock feeds. This work aces the study of plant environment and the correlated subject of animal nutrition, thus supporting in a practical man-ner the science of agriculture as taught

Dairying is also a prominent feature of the station work. For this purpose a herd of typical dairy cows and a well-equipped creamery are maintained. Many prob-

thus obtains tangible evidence of the practical utility of the sciences in dairy hus

affords the student an admirable oppor-tunity for comparing the work of the classroom with the practices of the field. Plant breeding, cross pollination of fruits, as well as modern methods of planting. pruning, grafting, spraying and cultiva-tion are all brought immediately under the observation of the student, thus affortiing him an excellent opportunity to become thoroughly conversant with the science and practice of horticulture.

Department of Pharmacy. Owing to the fact that there was no institution in the Pacific Northwest that offered a course in pharmacy, the advis-ability of adding such a course to those already existing in this institution sug-gested itself to those in charge of the af-fairs of the college, with the result that such a department was founded and has

een in operation two years.

Beginning as it did under most favorable conditions for successful growth, the num-ber of students enrolled during the two years is very encouraging to those inter-ested in the development of the depart-ment—the total number of students being

The course aims to teach the student facts and principles of immediate use in facts and principles of immediate use in the drug store, adapting the work to the needs of the practical pharmacist and manufacturing chemist. It is recognized that a thorough foundation must be laid for this work; hence the course has been designed to extend over a period of four years—the first two of which are devoted to the orthogy, college hypothes. The etc. to the ordinary college branches, the stu-dent beginning the special work only in the junior year. The degree bestowed up-on graduates is Bachelor of Science in Pharmacy.

By a special arrangement with the Ore-ron Board of Pharmacy, the final examition of the senior class is conducted by this board. Those who pass this examina-

Scott E. Harrisr, of Eigin, Or., is the first regular graduate to be granted a degree in pharmacy from this institution, he having completed the work and passed the board examination successfully.

During the past vacation new facilities in the way of equipment and room have been added, and it is expected that further accommodations will be in readiness for

accommodations will be in readiness for the classes of the next year. The present junior class has an enrollent of 16 members, the sophomore 12 and

#### Department of Assaying.

An important addition to the schedule of the Oregon Agricultural College was the establishment of a course in assaying. This extends through two terms of 12 weeks each, and consists of instruction in fire assay of gold, silver, zinc, copper and mercury ores; also such others as may be deemed profitable after the former have been thoroughly studied. Another branch of assaying not usually given at other inefftutions, and one, which by virtue of its usefulness must sooner or later receive much consideration, that of extraction by dissolving in cyanide of potassium, is also studied here. By means of the latter, as well as the bromine and chlorination processes, all the poorer cres and tallings from rich ores can be successfully worked; even black sand, that has caused such an expenditure of time and money in per-fecting apparatus that will remove the fine flakes of gold often so abundant, can be treated with great success by the cya

nide process. The equipment of the assaying depart ment consists of muffle and crucible fur-naces in which is used liquid fuel; fine balances, grinding machines, a full supply of re-agents for making wet tests, a large quantity of crucibles and scorifying dishes as both methods are taught, magnifying glasses, and all the various utensils to be found in a first-class assaying office. We expect to add for the coming year's work a 150-pound charge cyanide plant, a partial vacuum one-half horse-power stamp for grinding ores to any degree of fine-ness and another pulverizer.

As our facilities at present are alto-

gether inadequate to accommodate the increasing number for instruction in assaying, a new building will be erected in which 25 desks will be placed. During the past year but seven men could work to advantage. Five of these were sentors, four of whom elected metallurgical sub-jects for theses, two working on "The silver ores of Oregon," and two on the "Application of the cyanide process."

Under the circumstances attendant upon the introduction of any new branch of in-

# struction the results have been most say

The college has a well-equipped bacterio-ogical inboratory for the investigation and study of bacteriological diseases, both antmal and vegetable. The study of bacteri-ology has made great strides both in the patheological and the technical branches of the subject; and just as investigation. into the physiology of higher plants gave the first impetus to the establishment of agricultural experiment stations in all countries, so, in like manner, the physiol-ogy of formestation and tchnical bacteri-ology have called into existence within the last few years a number of stations and laboratories for the development of those branches of industry wherein micro-organ-isms play an important part.

## Department of Hortfculture.

The past year records few changes in the lines of work in the horticultural department, save those indicated by the fruitgrowers at their last convention, and an investigation of the time and condi-tions in and under which the fruit buds of our leading fruit trees are formed.

A continual study of the curi-leaf of the Italian pruve and the testing of new varieties of small and orchard fruits are leading lines of work. But the one fea-ture that is of most interest generally is the recent plantings of pedigree stock of orchard trees. In most instances these are of the old and well-known varieties, but in some cases new and promising varioties have been set out. These trees, together with the offspring of the work of cross-fertilization which is largely be-ing carried on by the students in horti-culture, will furnish the ground work for what is hoped to be important results in the horticultural advancement of the Northwest. Many of the recent introduc-tions of new varieties have been planted out this year for the purpose of testing their merits as compared with the stand

and varieties.

In the section of botany, considerable progress has been made with the work of the botanical survey, in the mat-ter of plant and seed collections. The phrenological feature of the work is be-ing carried on chiefly by the aid of field correspondents throughout the state. A great mass of material has been added to the herbarium collections in both phaenogamic and cryptogamic life. Some advance has been recorded in the matter

of special study of a few groups of na tive pinnts and a collection of photo-graphs of trees and shrubs of Gregon is being made with a view to publishing an illustrated monograph on this subject.

Professor E. R. Lake, head of the department of horticulture, will spend the Summer months in France in studying plant life in that country.

### The Library.

The library of the Oregon Agricultural College is fast becoming one of the best and most useful features of the institucion. Heretofore, it has been kept in a small room and left to the care of one or more of the students, but with the bemore of the students, but with the be-ginning of the present year a regular li-brarian was employed and the library moved from its former crowded and cramped quarters into a large, alry and well-lighted room on the first floor of the main college building, where there are ample accommodations for the shelving of the books and a reading and room for the students.

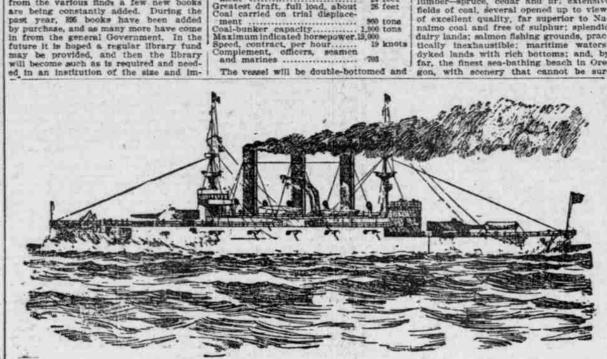
lems of vital interest to practical dairy-men are constantly being worked out along the lines of rations for cowe and methods for handling the herd. The student himself frequently assists in the work and geological survey reports, records of the

GEORGIA AND HER SISTER SHIPS PINEST OF THEIR KIND.

Civil War, and records and reports of the different departments of the Cabinet; and between 5000 and 5000 pamphlets, chief-ity bulletins issued by the experiment s'atlons of the various states. In addi-tion to these, we receive 80 regular week-ly and monthly publications, magazines, journals and scientific works. The library is catalogued by subjects according to the Dewey or decimal system, and alpha-betically by the titles of the books and the names of the authors, thus rendering Armaments Will Include Heavy Batnames of the authors, thus rendering available all the resources of the library upon any subject, and placing all liter-ture on any topic readily in the hands of teries of 12 and 8-Inch Guns and Many Rapid-Firers.

> The Navy Department has recently is-med a circular descriptive of the three new battle-ships, the Georgia, Pennsylvania and the New Jersey. According to the specifications set forth, they will be the specifications set forth, they will be the most powerful fighting craft affeat. Following are some of the features and

Length on load water line.... 425 feet Extreme beam at load water ..... 76 feet Trial displacement
Mean draft at trial displace Greatest draft, full load, about 25 feet Coal carried on trial displace-ment fields of coal, several opened up to view, of excellent quality, far superior to Nanaimo coal and free of sulphur; splendid dairy lands; solmon fishing grounds, practically inexhaustible; maritime waters; dyked lands with rich bottoms; and, by far, the finest sea-bathing beach in Ore-



UNITED STATES BATTLE-SHIP GEORGIA AND CLASS.

of 4 inches at the bow and stern, and in-creasing to 11 inches amidships. Extend-ing entirely around the ships and direct

ly above the water-line belt there will be a 2-foot cellulose belt. The sides for a distance of 245 feet will be covered with

6-inch armor. The protective deck, which reaches from bow to stern, is 1½ inches thick over the engines, and,3 inches thick on the slopes. On the forward deck it

curves rapidly down and ends in the ram. Four 12-inch and 8 8-inch rifles will com-prise the main battery. Two of these will be mounted in each of 6 turrets, of which

the armor will be 10 inches thick on the

12-inch gun turrets, and 6 inches on the 8-inch turrets. All turrets will be of the

balanced type, but the 12-fach will be cir-cular, and the 3-fach elliptical. The tur-rets will be so constructed that the guns will have an elevation of more than 20

Each of the 12-inch guns will be able to

fire every minute and a half, each of the eight-inch guns every 45 seconds, and the

six-inch guns about three times a min-ute. The auxiliary battery will consist

Three-inch (14-pounder) rapid-fire guns.12

Four of the 14-pounders will be mounted on each side of the gun deck, and two on

each side of the superstructure on the

main deck. The lower military tops will contain two of the automatic one-pound-ers, and each of the upper tops, two of the single-shot one-pounders. With the

the single-shot one-pounders. With the exception of the field pieces the other small guns will be mounted on the bridges and about the superstructure

deck. There will be two submerged tor-pedo tubes, the firing stations of which

six pounds. Four cylinder, triple expan-

sion engines will be used, and when de-veloping 19,000-horse power will make 120

revolutions a minute. The steam will be

at a pressure of 250 pounds.

At a 10-knot speed the vessels will con

the vessels fall below the required speed,

The Old Slave Got His "Young Mars-

ter" Out of Prison.

Memphis Commercial Appeal.

A little incident at the Police station one

afternoon last week attracted comment from various sources on account of the romance it embodied. An old negro walked

to the office and asked in a mild and respectful manner if his "young marster," M. C. Goin, was there. He was told that Goin had been fined \$2 for being Grunk

and was on the rock pile. He applied to Mr. Dye, keeper of the rock pile, and had a talk with Goin. The latter was very drunk when arrestst, and the Re-

der fined him 12. He hatis from

'How much," asked the old negro, "will

ou let him out for?"

Mr. Dye replied that \$1.35 would pur-

I hear 'em say young marster was in de

rock pile, I jes' cum up heah ter see him

The young man and the old ex-slave

To Study the Alaskan Coast.

SEATTLE, June 21.-The United States

lighthouse tender Columbine will sail to-morrow on her annual crutse in Alaska

waters. Besides her regular complement

of officers, she will have aboard two prominent officials of the Thirteenth Lighthouse District, Commander W. L.

Day, of the Navy, Lighthouse Inspector

the Thirteenth District, and Major

walked away together.

reject them entirely.

vessels at its own price or

pplied by 24 boilers capable of working

will be guarded against any shot

of the following pieces:

nree-pounders ne-pounders (automatic) ne-pounders (single-shot) hree-inch field guns.....

Gatlings ..... Automatics, .03 caliber .....

portance as the Oregon Agricultural College, with its 450 or more students.

The Heating Plant. This very important part of the college equipment was completed in October, 1996, and has proved to be far more efficient than the stoves, the hot air and hot-water systems which had before been used in supplying the various buildings with heat. The plant has all the latest and best seam-heating appliances, and has a capacity sufficient to keep the recitation rooms at a Summer temperature on the coldest days. The building, with a base 33 feet square and a height of 15 feet, is made of brick and stone, and has a brick chimney 55 feet in height. The steam is furnished by a battery of two steel boilera, 75-horsepower each, which is conted with the buildings by double lines of steam pipes running through under-ground brick conduits.

New Bowling Alley. The bowling alley was put in last Spring at a cost of \$900. It is located in the barement of the Armory Hullding, where it may be used by students and the faculty, incides and gentlemen alternating in days. In order to pay the expenses of con-ducting it, a small fee of 2 cents a game s charged. The alleys were opened on the 11th of April last, and up to this date 5500 tickets have been sold. Mr. W. H. Beach, of Oregon City, has been played in charge of this department. Arrangements will be made to keep the alley open during the Summer vacation for the benefit of local residents.

Printing Department. During the past year the college print-ing plant has been moved to the quarters especially built for that purpose in the new mechanical half. All the printing material was destroyed in the fire that visited the college the year before, hence everything on hand is new. There are two Gordon presses, a half-medium and a quarter-medium; stitcher, a paper-cutter, type, etc., which were purchased at a cost of about \$700. The college does all of its printing, including diplomas, bulletine, catalogues, and such other work bulleting catalogues, and such other work as in necessary to the advancement of the institution. Much photogravure work is printed at the office, it being necessary to produce the illustrations from life, hence requiring first-class work. The office turns off about \$7500 worth of work annually, making a saving to the college of about \$6 per cent. At the present time this department is under the supervision of Mr. G. B. Kendy, who has had long he country.

The College and Station Accounts. The business of the college is transacted from the clerk's office, there being on an average about \$190,000 changing hands each average about \$100,000 changing lands each year. Professor T. H. Crawford, formerly City School Superintendent of Portland, has been the book-keeper for the past three years. A system of records has been introduced by Mr. Crawford which makes it possible for the Board of Regents to step in at any time and ascertain from the books the true condition of all the husbers affairs of the

The College Grounds. There have been many changes on the grounds during the year, although at the beginning the campus was very much torn up up by the excavations going on for the steam-heating plant. All of these excavations have been put in order, and the grounds have the appearance of never

tion of all the business affairs of the

having been moiested.

The orchard-40 years old-north of the Administration Building, has been practically eliminated, a newly made lawn taking its piace. Walks have been made so that the student may be the better ac-commodated in passing from the mechanical hall to the college, also to the power-

Trees and shrubbery have been planted all of which are putting on a splendid growth, and the greenhouse is better sup-

plied than ever with plants, In order that the institution may avail itself of the intest and the best in the various departmests, it has been the prac-tice for some of the faculty to spend the vacation in some Eastern university. This system has been attended with good re-sults. In accordance with the idea, Pro-fersor Dorothea Nash has obtained a

leave of alsence for one year to study music in London.

During the present year there has been added to the faculty a lady dean in the person of Miss Helen Chamberlin, from Washington University, but more recently of the State Normal School at Mon All. Dye replied that it is would purchase his liberty. The old man pulled out a tobacco sack, and, unjouening the strings, got out \$2. The young man was released. Being asked why he was interested in the young man the old man said:

"I belonged to his father endurin' the war, and no better man ever liyed. When I hear 'em say young marster was in de

The office of stenographer was created at the beginning of the year, and Miss Helen Holgare was appointed to the poorder to raise the literary standard

in order to raise the literary standard of the institution, the catalogue will say, freshmen found deficient in preparatory studies may at the discretion of their institutions be assigned to the sub-freshmen class in order to make up such deficiency. Students before promotion from this course must be able to pass an examination in spelling and grammar equivalent to that required for a first-grade teacher's certificate.

Minister Drowned While Bathing SONOMA, Cal., June 21.-The Rev. F. B. Bartlet, pastor of the Episcopal Church of St. Mary the Virgin, of San Francisco, has been accidentally drowned while bath-

equipped with the usual water-tight com- passed. The first question one asks on finding these resources is, "Why does not Nehalem Bay go ahead, then?" Some people say its residents are lazy, good-for-nothing people. I deny this, as I mixed among its citizens and can tespartments. The fire mains will be cov-ered with the protective deck, and the stations above connected therewith at convenient points. Wood will be used only in so far as it is indispensable, and even this will be fireproofed. The main deck will be planked, but under it there tify to the contrary. The true causes First-Lack of railroad connection with Portland. will be a complete metal deck. In other places where it is necessary to use planked decks they will be covered with linoleum. The freeboard will be 30 feet from bow to

Second-No harbor improvements at its sea entrance. There has never been spent one single 5-cent piece upon its bar. Yet, strange to say, it admits vessels drawing stern, and as this will permit of the offi-cers' quarters being placed outside the armored region, much better ventilation to 12 feet, as I witnessed, and is only 38 miles from the Columbia River. What can be secured.

A water-line belt will extend the whole length of the vessel, having a thickness it needs in that respect is a Government appropriation of \$50,000 for a small break-water (no more) to secure 17 to 18 feet

of water all the year.

Third—Its total isolation from the world. y land, being devoid of wagon roads ither to its own vast Nehalem Valley, reached for 60 miles back on a grade of only 10 to 12 feet to the mile, or to Astoria. Yet Tillamook, of which county Nehalem is a part, possesses the best machdamized wagon roads around the bay and Tillamook City, to be found in

a necessary result, I found a pop-ulation of only 50 to 375 persons in Ne-halem district, or 118 voters, including the Poley district; two sawmills, cutting less than 20,000 feet of spruce per day; one good cannery, Elmore's; three stores, one saloon, butcher, barber and black-smith shops, two carpenter establishments, five schools, one church, and a telephone line, with occasionally lum-ber schooners, carrying spruce lumber to will have an elevation of more than 2degrees. The secondary battery will consist of 12 6-inch rifles, inclosed by 6 inches
of armor, and separated by nickel-steel
bulkheads. The arcs of fire will be 116
degrees, while the 12-inch guns will have
arcs of 270 degrees, and the 8-inch guns
can be trained from the beam to dead
Nehalem Bay. Why? Because its 20.ber schooners, carrying spruce lumber to San Francisco, the logs costing only 33 chalem Bay. Why? Because its 20. 000,000,000 feet of timber must either be carried to Portland as logs from points 30 to 90 miles, and there manufactured for overland rail shipment, or carried down

to Nehalem Bay and there made into lum-ber for foreign or seacoast export. How is this to be accomplished? Not by a railroad to Goble, St. Helens, Rainby a railroad to Goble, St. Helens, Rain-ier or anywhere else on the Columbia River, because the grades are practically impossible to operate cheaply, ascending to a summit of 1750 and 1850 feet in a distance of eight to nine miles. No man knows this better than I do, from ex-perience, having spent \$40,000 on railroad surveys to find this out. A railroad to Portland would be totally different, as from there it has over 31 miles to reach from there it has over 33 miles to reach the highest railway summit of only 100; feet, a gradual ascent almost, and thence descends 32 miles gradually to the sea. descends 22 miles gradually to the sea. Furthermore, only 80 miles of railway are necessary to construct from the City of Portland to Nehalem Bay to obtain these advantages, and while in transit the railroad could connect with and carry all of the logs of Nelwiem Valley, upper and lower, to Portland by connecting with the middle river at a point 27 miles or more above the sea. more above the sea.

Thus loss or lumber and dairy produc ould be carried from points above or selow the falls of Nehalem far cheaper Portland, which is also nearer than sume about To tons of coal a day, which, to the Columbia River, and on far easier grades. Besides Nehalem Bay coal, of superior quality, would have 80 miles' haul, and if the recently discovered nine with full bunkers, will give them a steaming radius of 6000 knots. The ves-sels must be finished in three years. If to 10-foot veins be tapped, a 50-mile haul to Portland, and all this whether the \$50,000 a quarter knot will be deducted for each of the first two quarters and \$100,000 for each of the next two. If the speed breakwater to cost \$50,000 he built. Of course, the latter is essential for deepfalls below 18 knots the Government may water vessels with lumber for San Fran-cisco and for Pacific Coast ports, and therefore our Chamber of Commerce and Board of Trade should unite in asking Brigadier-General Wilson and Congress to have this small breakwater started next year, with an appropriation of, say,

> Nevertheless, that ought not to farthe delay the construction of an indepe rallway direct from Portland to Neholen Bay, and will not. The total length of the line would be about 80 miles, at an actual cost of \$1,200,000, including equipment, the income from which, with 30 000,000,000 feet of timber to haul for Signars, with the coal, would pay its cost five times over in that period, with per cent interest additional, excluding other freight, passengers and merchan-dise. I speak from experience, having recently traveled over the route and sur-veyed portions on foot. Another item of value would be the sea bathing, or Sumer tourist travel between Portland and Nehalem Bay, to which 90 miles by rall would be the distance against 118 miles to the seaside via the Astoria & Columhia River Railway, and with a far su-perior beach in front of Nehalem Bay No one expects Portland capitalist invest in this or any other railroad terprise, still they can co-operate to bring what is now essentially nece Portland's sawmills - 1,000,000 logs per day—which all of the mills of Multnomah County now manufacture into lumber and will increase this output enornously when the Nicaragua Canal is WILLIAM REID

Captain George Towle Dead. NEW YORK, June 22.—The death a F. Towle, U.S. A., retired, aged & years.

Oh, What a Headache!

# LOCOMOTIVE PROGRESS

WHAT HAS BEEN ACCOMPLISHED DURING THE PAST TEN YEARS.

Great Gain in Speed-All Parts of the Engine Improved-Boilers and Brakes.

The most helpful influence in loc design and construction during the last decade has undoubtedly been the more thorough understanding of the problem by both the users and the builders of locomotives, writes R. H. Soule in the Railway Age. In 1890 we were approach-ing a period of depression which caused forced economies in all branches of rail-road administration. The motive-power on foot, over the same inaccessible country which Major McNeill visited, and I can truthfully indorse his remarks. Although the buy is inaccessible from all road administration. The motive-power departments emerged from that period triumphant, having accomplished reductions of expenses which had not been considered possible before.

This valuable experience had the effect of direction the effect of directions the effect of th

of directing the attention of designers to he problem of so constructing tives as to get more work out of them than had been customary. New engines were then and have since been designed to do maximum work with great econ omy. Tractive power being proportionate to weight on drivers, modern locomotives have been made much heavier than their prodecessors. As speed depends on etesm supply, there has been a tendency to enlarge bollers, and this tendency, together with the receiver of the total. with the necessity of keeping the total weight of each new engine within the de-stred limit, had led to an effort to lighten as much as possible the parts other than boller; hence the free use of malle-lron and cast steel where cast iron able fron and cast steel where cast fron was previously used. Many parts—such, for example, as driving-wheel centers—have been made stronger, while thus being made lighter. The more economical performance of locomotives having been kept steadily in view, the advantage of increased expansion has led to the use of higher pressures. Large botters and high pressures are the central and salient features of modern locomotives. These conditions have demanded improved mothods and great care in boiler construcmotheds and great care in boiler co-tion. The result is that the loca boiler of today, asthough the conare so much more exacting, is very much better and safer, and may be expected to have a longer life than ever before. The use of ductile steel flanging machines and improved bending rolls, combined with careful workmanship, results in accurate fitting. Hydraulic riveting ma-chines have been evolved in as many spe-cial forms as required, so that practical-ly every rivet in a locomotive boiler shell, especially if the back head flanges be turned out, as in many Wootten boilers, may be driven by power. Dome construction has been greatly improved and strengthened. The use of high pressures and heavy plates has developed a preference for the simpler forms of boiler construction. It may be expected that straight-top boilers will be more in favor and Belpairo boilers less in favor in the

But, although the boller has had much attention concentrated on it, nevertheless the other parts of the locomonive have re-ceived their share of thought and have been improved to correspond. Cylinder been improved to correspond. Cydnaer fastenings, both to the beiler and to the frames, have been greatly benefited by the attention bestowed on them. Pistons and piston packings have been simplified and made more reliable. The piston valve has crept into popular favor, and deservedly; the success of the piston valve has been demonstrated on a large rock. scale in connection with the Vauchin type of four-cylinder compound engine, where there was no escape from the use of that type of valve; but the prophets of 1890, who predicted disaster from its use, are now applying platon valves to their simple engines. As a matter of fact, there is no one detail of the Vauclain our-cylinder compound engine which has ments of the last 19 years as the pistor valve.

In passing, it may be noted that the one vital part of the locomotive which has not been modified in any particular in 16 years is the Stephenson link mo tion; it remains unchanged. Our tire makers have learned to produce tires of superfor quality, which give increased mileage and which warely break. The increased mileage is, of course, favorably affected by the improved forms of driver brakeshoes, which operate to dress off the long the period between shoppings and during which an engine may remain in service. Ten years ago many engines had a form of driver brake gear in which only a portion of the driving wheels were fit-ted with shoes; today every engine not only has brakeshoes on each and every driving wheel, but all are so connected that the pressure is equalized and the work of retardation is evenly distributed between the several driving wheels under all circumstances. The air pump of to-day is enlarged but simplified, as compared with its predecessor of 10 years ago, and is more in keeping with the present requirements of brake service.

Many of the minor parts and attachients of locomotives have been improved

Metallic packings have been modified to suit present conditions of high pressure, etc., until they are new more reliable than in the days of lower pressures. Pneumatic ganders, originally looked upo as a luxury, have now been accepted an an indispensable necessity, and their gen-eral use has made it necessary to revise the old rules which were used to estab lish the ratio between tractive power and weight on drivers. Modern sight-feed lu-bricators will deliver lubricant to the cylinders as surely and regularly when the engine is using steam as when drifting. The modern injector will pick up its water again after breaking, and thus relieve the engineman of much distress. The increased knowledge of the fundamental problems of locomotive design, as first above referred to, is plainly evi-denced by the annual reports of the Mas-ter Mechanics' Association since 1890. Dur-

ing that period several committees have made searching inquiries and able reports, and have reduced to definite formulae and rule some important matters which before had been regulated by precedent rather than principle.

Comparing our own progress with that of foreign countries, we have certainly benefited by our American practice of the

free and open exchange of information, and our readiness to abundon any practice or construction for a better one: whereas, our foreign friends are restrained and held back by the opposite qualities.

#### Wild Western "Joshing." Omaha News.

It's rather a good joke on one of our Omaha boys when he was in the South a couple of years ago. Frank, he's the one, was in Atlanta with ompany L, and his brother Harry was rery ill in Omaha. Frank was an awfully good fellow and remendously jolly. The fellows called

lady's man and had "won a home" with some girl in a neighboring town. "I tell you, Lightly, she's a wizard." Lightly was a telegraph operator and a great friend of Frank's.
"And you're going to take her to the

show tomorrow night, are you?"
"You bet your life. Say, she's a queen!
Pretty? Well, I would say she wes! But
look here, Lightly, you know Harry is to ndergo an operation today, and if any thing happens mother will wire me. You send it to me at once."
"All right, old man, I will, and you

may go and see your fairy."
Frank and the girl were enjoying the performance immensely, when, at the end of the first act, someone stopped from ehind the curtain with a telegram in his oand. The house was still and everyo

Oh, What a Headache! the worst, stepped to the front, took the Relieve it in five minutes with Wright's envelope, read the message and hurst out Parsgon Headache and Neuralgia Cure. laughing. This is what he read: "If she's

Frank, white, trembling, and expecting

such a winard, love her twice for me On his way back to his seat some rom the gallery hollered: girl?"

the gallery hollered: "Is it a boy or Poor Frank! He felt like two Marriage and the Schooltencher,

Marriage and the Schoolteacher.

New York World.

Jersey City's School Board is deeply agitated by the alleged discovery that one of her school teachers carried on the salary-rois as "Miss" Grace Ryan is in reality not a "Miss" at all, but a "Miss". The lady neither denies nor admits the soft impeachment. There is an entry, however, on the marriage records of the city which on its face sustains the allegation that she is not a spinster, nor has been for two years past.

The School Board has split into two factions on the subject, the one faworing "Miss". Ryan's immediate dismissed, the other contending for her continuance as a schoolteacher to the end of the present term.

This episode in the school life of Jersey City calls attention again to the curi fact that the employment of a sche teacher is the only one in which won eacher is the only one in which women ire by custom that is as strong as law forbidden to marry on pain of forfeiting their places and salaries. The woman who writes shorthand, keeps books, operates a writes shorthand, keeps books, operates a typewriter, works as a compositor, a milliner, a dressmaker, or in any other of the numerous occupations now open towomen, can marry and go on earning wages. The schooltencher alone is dented the right to marry and still work for a living. Perhaps this has something to do with the fact that the vocation of the schooltencher is not so eagerly sought as it musd to he, before so many other occupations in which singleness is not a condition of employment gave a welcome to woman's labor. tion of employment gave a welco

Gerald Stanley Lee in the Atlantic. The truest deduition of a gentleman is The truest definition of a gentleman is that he is a man who loves his work. This is also the truest definition of a poet. The man who loves his work is a poet because he expresses delight in that work. He is a gentleman because his delight in that work makes him his own employer. No matter how many men also over him, or how many men pay him, of full to pay him, he stands under the wide heaven the one man who is master of the earth. He is the one infallibly overpaid man on it. The man who loves his work has the single thing the world affords that can make a man free, that can work has the single thing toe work can fords that can make a man free, that can make him his own employer, that admits him to the rank of gentlemen, that pays him or is rich enough to pay him, what

him, or is rich enough to pay him, what a gentleman's work is worth.

The poets of the world are the men who pour their passions into it, the men who make the world over with their passions. make the world over with their Everything that these men touch, as with some strange and immortal joy from out of them, has the thrill of beauty in it, and exultation and wonder. They cannot have it otherwise even if they would. A true man is the autobiography of some great delight mastering his heart for him, possensing his brain, making his hands beautiful.

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