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PLAN ELECTRIFICATION
OF EASTERN RAILROADS

U. S. Geological Survey Investigates and Makes
Report

SUPER POWER ZONE LAID OUT

Some of the striking advantages of electric operation of the railroads in what has been designated the superpower zone—the region between Boston and Washington—are stated by the United States Geological Survey as a result of a recent engineering investigation. These advantages include the conservation of national resources, both coal and labor; an increase in the capacity of main and yard tracks; an improvement of the physical condition of terminals and an increase in the value of the property, as shown by the New York Central and Pennsylvania terminals in New York City; benefits both to the traveling public and to residents along the route through the elimination of noise and smoke; the possibility of providing multiple-level terminals and freight warehouses; and economy in operation through the use of fuel and machinery for generating energy by a few skillful operators in economical stations as contrasted with a large number of technically ignorant operators with small, uneconomical machines.

The electric locomotive is equipped with meters that afford complete knowledge and control of operating conditions and that are also a valuable guide in handling the train, particularly in starting a long, heavy train. With electric traction the economy of the entire sequence of operation is not dependent upon one man, as it is with steam. Operation is therefore no longer a matter of individual human judgment, skill, or fidelity. It is this unfortunate human element that nullifies the theoretical advantages of the "full-jeweled movement" steam locomotive. The effectiveness of the devices for increasing efficiency and capacity, such as brick arches, super-heaters, stokers, siphons, automatic fire doors, and power reverses, necessarily depends on the intelligence and faithfulness of the average engineer, and in consequence the average results are low. The inherent wastefulness of the steam locomotive is proved by its own advocates in their claim that "40 per cent of its coal can be saved by the careful use of these auxiliary devices." Then why be skeptical, it is asked, of a saving of 60 per cent by a modern power station, which has all these devices in greater completeness and, in addition, has brains to use them?

The speed of different classes of trains run by electricity will be more nearly uniform. Much heavier trains can be handled, and at the same time light freight trains can be moved at the speed of local passenger trains. It has been proved that for the heaviest freight service, such as mountain-grade work, the electric locomotive is superior to the steam locomotive, but its superiority in handling light freight at high speed is not so generally understood.

As the electric locomotive is simple and as all the electric locomotives of a given class are identical and no more skill is required to operate them than is demanded of an ordinary chauffeur, all these locomotives will be pooled, so that the total number required will be materially reduced.

A considerable saving in time and hence an increase in capacity under the superpower system will be made by lengthening the operating divisions, which will be from 200 to 400 miles long instead of 100 miles. An electric passenger locomotive will run in the morning from New York to Boston and will return in the afternoon or at night, making a total run of 450 miles a day. A similar round trip will be made between New York and Washington, or New York and Syracuse. The electric locomotive can be kept at work on the road for 20 hours a day, and if operated at an average speed of 25 miles an hour it can run 500 miles a day. This mileage, however, is double that of the electric passenger engines now used on the New York, New Haven & Hartford line and is higher than would be obtained as an average, but there is every reason to believe that with unified operation an average between 250 and 500 miles can be made.

In a word, steam operation can not satisfactorily meet the conditions of the crowded terminal described as the superpower zone; electric operation can easily do it.

CAPTAIN CLARK HAS CHARGE OF
SOPHOMORE MILITARY SCIENCE

Captain H. F. Clark of the Military Science Department, of compass fame, will have complete charge of all Sophomore lectures in Military Science, 32, for the second term. Contrary to Bulletin information the lectures will be held in room 2-390 instead of in room 5-330 as listed on the Tabular View. The subjects Captain Clark will discuss with the Sophomores will be the "Duties of the Engineer," and "Construction Work as Carried on During War Times."

R. O. T. C. ENGINEERS PLAN
OLD FASHIONED STRAW RIDE

In conjunction with the Civil Engineering Society of the Institute the Engineer Unit will hold a smoker on January 12. Colonel Willing, the Corps Engineer in charge of River and Harbor Work, will give an illustrated talk on the work of the Corps Engineers along the Mississippi River.

The unit is also planning to have a good old-fashioned strawride on the Wednesday following the first big snowstorm and C. D. Dippel, secretary of the Engineer's Unit Association, advises the members to tell the girl to be sure to keep that date open.

Later on the unit will hold a dance. It was the candid opinion of those who attended last year that they never had a better time, but Dippel feels sure that those who come to this one will enjoy at least a duplication if not a better time.

STUDENTS COMPLETE
TERM'S REGISTRATION
(Continued from Page 1.)

stub and deliver them to the new instructor.

If a student drops a subject, or leaves during the term, he should ask the instructor to give him his class card, signed by the instructor, with date of last attendance. This card must be returned to the Registrar before registration is cancelled or any fees returned.

Students who register for subjects which are not approved by their department or first year committee will have their names removed from the rolls of subjects which, by their standing, they cannot continue or enter.

The Registrar says that many students go through an entire course without knowing the name of their instructor. Quite frequently a student indicates on his examination book that he does not know the name of his instructor. Therefore Professor Humphreys has requested that all instructors write on the board at the first exercise his own name and the name and number of the subject to be studied.

Junior Freshmen Admitted.

There are about 75 or 100 Junior freshmen registered. This year freshmen who failed enough subjects to make it necessary for them to repeat their term's work, are being allowed to enter the Junior freshman class. For this reason not as many men are leaving the Institute, for most of the men who left previous years were freshmen.

The usual number of transfers are registered. Of course not many students transfer at this time, for it is more advantageous to them that they start at the beginning of the year.

Students who failed to graduate last June, but who have since then completed the requirements will receive their degrees at this time

UNIFORM COMPULSORY
FOR LOWER CLASSES
(Continued from Page 1.)

mutation is granted by the Government next year the Seniors will be required to wear the uniform but one year before it becomes their personal property. Besides furnishing the funds necessary for the buying of the uniform the Government also furnishes six dollars per uniform per year for its upkeep.

Colonel J. B. Christian requests that each class appoint two representatives to assist in the selection of a uniform for use at M. I. T. in case commutation of uniform is granted.

General Edwards in a letter to the authorities in charge at the Institute outlined the plan of the Government for the formation of the R. O. T. C. as follows:

I am extremely interested in the development of the Reserve Officers' Training Corps, especially in regard to having as many students as possible avail themselves of the opportunities offered by this organization. Student Military Training has proven itself to be of great value not only for the national defense but also for the betterment of the student in making himself more valuable for all the relations of civil life. I would like to see every able bodied student avail himself of the opportunities offered by the Reserve Officers' Training Corps.

Our policy of national defense contemplates a small regular army and the organization of a large citizens' army. The organization of this large citizens' army is well under way, and there is a pressing need for our intelligent, college-educated men to officer this organization. The Reserve Officers' Training Corps is the principal source upon which we must depend for reserve officers and, although it has contributed many splendid officers, we must look to it to increase its supply.

This year shows a marked increase in enrollment in every Reserve Officers' Training Corps unit established in the Colleges of New England. I am extremely gratified with this excellent showing, and trust that next year will show another large increase. It signifies the desire of our youth to prepare himself to serve his country in the hour of need. I have written to the Professor of Military Science & Tactics at your institution, directing him to make a survey of the pos-

sibilities of increasing the enrollment the next academic year, and I have asked him to consult you in this matter. Any assistance and advice which you may render the Professor of Military Science & Tactics in making this survey will be greatly appreciated.

I am firmly of the opinion that our present Military System for National Defense will make better citizens of the youth of the country. The fact that they will be a part of the Army of the United States and members of a definite organization, such as a Company and a Regiment, where the exchange of views will take place, will develop public opinion with reference to military, economic and international affairs. There is also a distinct moral advantage in the contemplation of patriotic service. But, perhaps, the greatest benefit of Military Training is found in the opportunity it gives for developing a gift of leadership and responsibility.

The leaders of this great movement must be the educated college men. The opportunity offered them by Student Military Training, through the Reserve Officers' Training Corps, gives them the distinct advantage of becoming the leaders of the youth of the country. To this end, the War Department appeals to the institutions of higher education to give the college man such reasonable means of Student Military Training as will enable him properly to prepare himself for his future duties as Reserve Officer of the United States Army.

R. O. T. C. Enrolment Increased

Professor E. F. Miller, Faculty director of Military Science, states that the enrolment at Technology in the R. O. T. C. units has increased steadily as shown by the report of enrolment at Technology, this report having been filled out by Colonel J. B. Christian, professor of Military Science and Tactics at Technology. Colonel Christian estimates that about 75 per cent of the men really available have been secured.

A number of these men have felt that when enrolled in the R. O. T. C. unit they could not fulfill their obligation to the Government to go to a military camp, on account of conflicts in time between summer work at Technology and the work scheduled at the military camp.

Acting on the advice of Colonel Christian the Administrative Committee of the Institute sent the following letter to the War Department regarding commutation of uniforms:

1. Under the provisions of paragraph 12 S. R. 44, request is made for commutation of uniform beginning with the Academic Year 1922-1923.
2. The Military Science Department has enrolled in five R. O. T. C. Units 1500 students, and it is desired to adopt a uniform other than the enlisted man's uniform which is now furnished in kind. It is believed that the change will be for the best interests of the Government, the Massachusetts Institute of Technology, and the Students.

The budding aviators of Georgia Tech are planning great things for the coming year, of which the most important is the acquisition of a landing field. Aviation in Atlanta has been seriously hindered by the lack of such a field, and the air club feels confident that if this defect were removed, great progress would be made in flying at the school.

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