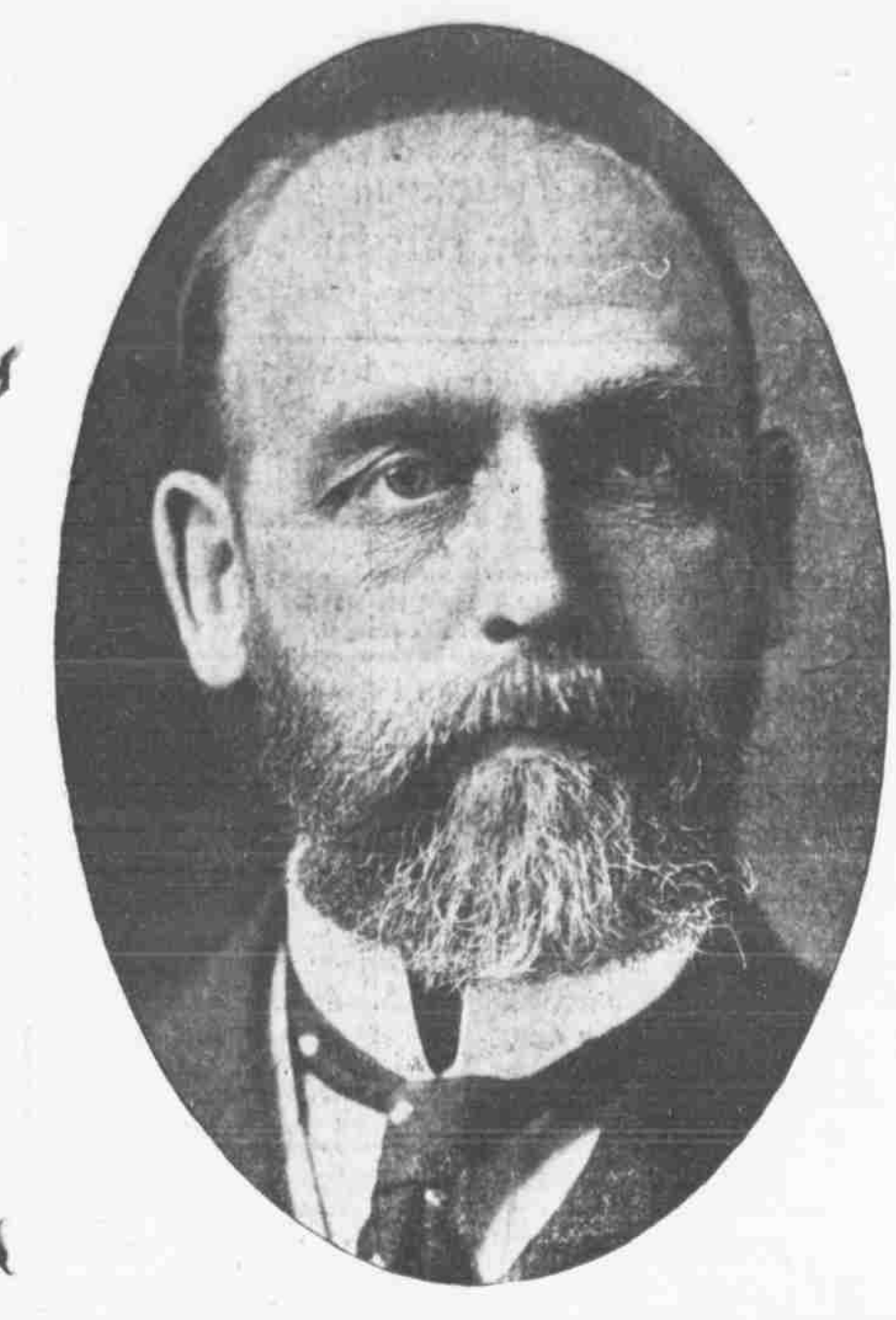


Government Reclamation Service as a Builder and Maker of Homes



FREDERICK HAYES NEWELL, DIRECTOR OF THE UNITED STATES RECLAMATION SERVICE.

Frederick Hayes Newell, who has been appointed director of the reclamation service, vice Charles D. Wolcott, who has been elected secretary of the Smithsonian Institution to succeed the late Prof. Samuel Pierpont Langley. To those who know Mr. Newell he is one of the mildest manner of men, and yet with a determination that brooks no interference. His capacity for work is prodigious and he lives nothing better than to survey great projects, overcome seemingly insurmountable obstacles and make grass grow where but a short time before there was nothing but barren waste, the habitat of the prairie dog and the rattlesnake.

To be a home builder is in itself a crowning ambition, but to be a national home builder, or providing the land upon which thousands of homes may be built, with every advantage of agriculture and horticulture, is indeed the realization of most ambitious desires. This is what Frederick H. Newell is doing—he is building homes for the people.

Frederick Hayes Newell was born in Bradford, Pennsylvania, March 3, 1852. He graduated from the engineering course of the Massachusetts Institute of Technology in 1876, and later took a post-graduate course in hydraulic work. The graduates of this college, owing to its high standards and excellent facilities, are found in the front rank of the civil and mechanical professions.

Immediately after completing his course Mr. Newell took up his professional work in Colorado. Here he came into direct contact with practical irrigation on a large scale. His stay in Colorado left a deep and lasting impression, which was responsible in no small degree for his accepting a minor position as hydraulic engineer in the irrigation survey in 1888. During the formative stage of this survey its rather chaotic conditions afforded an excellent field for the exercise and development of young Newell's capacity for organization. Through all the vicissitudes, which the new bureau passed he never wavered in his purpose of doing well and thoroughly everything assigned by him. The irrigation survey proper was short lived, as congress failed to provide for it after 1890. Authority, however, was granted to continue the measurement of streams and to select survey and aggregate reservoir sites. All of this work was placed directly under the charge of Mr. Newell.

His star was national reclamation of the Great American Desert, and for eighteen years he has devoted all of his skill and energy to the work of acquiring information concerning the resources and needs of the arid west. It is said that he has first hand knowledge of every important stream in the west. The extensive and valuable results obtained through this work attracted wide attention, and the demand for data led congress to increase the appropriation gradually until in 1892 they amounted to \$200,000 annually.

The early work was mainly in a vast wilderness, full of obstacles to civilized occupation, and the results were largely responsible for the subjugation of many

desolate valleys and the development of large areas for agriculture. His work opened new channels for industry, new employment for many thousands and continues to afford opportunities for the home-seeker.

The reclamation act of June 17, 1902, was the logical development of the investigations of the previous twelve years under Mr. Newell. Naturally his administration was placed in his hands as chief engineer by the director of the geological survey. His appointment to the position of director of the reclamation service, now an independent bureau of the interior department, is a proper recognition of the invaluable services he has rendered the government. It furnishes also an inspiration to those who are devoting the best years of their lives to government work.

Mr. Newell's fitness for great responsibilities lies chiefly in his all-round perfect balance, supplemented by good common sense and a judicial attitude of mind by which he can at any time patiently hear and give due weight to the suggestions of others. This is a remarkable degree he is able to bring to his work, the combined wisdom of many minds, avoiding the errors of the cook-stew against on the one hand and of the plant tool or working on the other.

If Mr. Newell has anything that may be called a hobby it is his insistence on a close personal acquaintance with the work which he has charge. He spends a large share of his time in camp discussing details on the ground with those who are designing or building works, thus equipping himself for quick and wise decision on the many points of importance that constantly demand executive action. He is an incessant worker, and has the capacity for an immense amount of business, yet never appears to be hurried nor overwhelmed by the duties of his office.

An invaluable element of his extraordinary success in organization lies in his capacity for choosing wisely the men needed for responsible positions, and in maintaining an esprit de corps among them that has challenged the admiration of all who have come in contact with the reclamation service.

As a result of his foresightedness and his ability in organization, the reclamation service entered upon its new career within a year after the passage of the act, and two years later a great project in Nevada was formally opened to settlement. At the present time construction work is going forward on twenty-five projects in twelve states and two territories, involving the ultimate expenditure of \$40,000,000 and the reclamation of 1,200,000 acres. In less than five years the service has practically completed four projects and will supply water this year to 22,000 acres of desert.

It has dug 1,267 miles of canal, several of which carry whole rivers; its tunnels are more than ninety miles long and the excavations of earth and rock amount to 2,000,000 cubic yards, or about one-fourth the estimated yardage of the Panama canal. It has constructed ninety-four large structures, including two great dams, one in Nevada and one in Idaho. It has built 276

miles of road in mountainous country and through heretofore inaccessible regions. It has erected and in operation 1,373 miles of telephone lines. It has 1,134 horses and mules on hand and at work, is operating nine locomotives, 223 cars, twenty-three miles of railway, thirty-nine stationary engines, twenty-seven pumps and five electric light plants. The work is giving employment to 10,000 people and involves the expenditure of approximately \$100,000 a month.

As a result of the operations of the reclamation service eight new towns have been established, 100 miles of branch railways have been constructed and 10,000 people have taken up their residences in the desert. The work has given a decided impetus to every line of industry in the west.

In a talk with Mr. Newell the other day he said: "The work of reclaiming lands is interesting from its very nature. It means the furnishing of homes to thousands of persons and an enormous increase to the revenues of the country. Hundreds of thousands of acres of land that are now practically valueless will, when cultivated, sustain one person to the acre.

"During the coming summer I shall divide my time between an inspection of the various projects in the west and in Washington. The work has continued throughout the winter wherever possible, though severe winter conditions have retarded it in a number of instances. The work on the Roosevelt dam on the Salt River above Phoenix, Ariz., which, when completed, will be one of the largest structures of the kind in the world, has been delayed because of the many floods which have continued throughout the winter. The railroad tracks near Phoenix, Ariz., were washed out eleven times during the year.

"I have been connected with reclamation work since 1888, and it has always proved intensely interesting. The work of transforming a desert into homes has a fascination and interest of special value in the preliminary work of the reclamation service.

"While working in the Nevada desert, which for forty miles is covered with the bones of animals and men, we found water within fifteen feet of the surface. This land is possible of cultivation and in a few years will be a land of farms, supplying homes for thousands."



ARTHUR P. DAVIS, New Chief Engineer.

On the recommendation of Director Newell, the secretary of the interior, has promoted Mr. A. P. Davis to the position of chief engineer from that of assistant chief engineer of the reclamation service, February 3, 1907. He was educated in the public schools of Junction City and Emporia, Kan., and later completed an engineering course in the George Washington university. At the age of 25 he entered the United States geological survey, as a member of the topographic branch and since then has been closely identified with the topographic, hydrographic and engineering work of the government. His early work was in the west, where he spent

several years in surveying reservoir sites in the high mountains and in measuring the streams of the great American desert. His name is attached to many of the original maps of Arizona, New Mexico and California. The reports of his investigations are valuable contributions to our knowledge of the arid country and its possibilities, and have been of special value in the preliminary work of the reclamation service.

In 1898-1900, Mr. Davis had charge of the hydrographic work of the Nicaragua and Panama canal routes and his reports furnished much needed and important information concerning both plans. He joined the reclamation service immediately after the passage of the reclamation act and since that time has been closely identified with all of the engineering work connected therewith. The bureau of which he has become chief engineer is now expending more than \$100,000 per month in the construction of twenty-five large irrigation projects, which will reclaim 3,000,000 acres of land. The work gives employment to more than 10,000 people and has already reclaimed nearly 300,000 acres of desert.

WASHINGTON, April 13.—(Special Correspondence.)—In its role as a builder and homemaker the reclamation service, since its establishment in 1902, has become known throughout the nation and its results are largely traceable to Frederick H. Newell, who but recently was appointed by James A. Garfield, secretary of the interior, as director of the reclamation service, and its erection into a separate bureau of the interior department.

The revenues from the sales of public lands in arid and semi-arid states have been employed in constructing irrigation works which, when completed, will reclaim 1,200,000 acres of the public domain. Canals are being built, tunnels dug and ditches run equal in length to the distance between Washington and Omaha. This immense work has been accomplished promptly, quietly and without friction in a refreshing contrast to the troubles that have impeded work on the isthmus.

And this achievement, notable as it is, must be primarily laid at the door of Fred-

New Developments and Experiments in the Field of Electricity

Washington to Baltimore by Trolley. PRO promoters of electric lines have completed financial arrangements for a double track electric line connecting Washington and Baltimore. Passenger travel between the two cities is large, frequently taxing the capacity of steam roads which run trains every hour. The projected line will have trains every fifteen minutes, which will make the run as speedy as the steam trains. The trolley cars will be operated singly for the ordinary service, with special limited trains of two or three cars at intervals during the day when traffic is densest. A cafe car will be a feature of the service.

The cars to be used will be the longest ever built for regular service on electric lines. They will be sixty feet in length, and probably the most costly in use on any interurban line in the country. This will not be on account of luxurious furnishing, but because the alternating current system to be used requires a very heavy and expensive motor equipment.

An initial order for twenty-five cars has been placed, each to cost \$21,000, the motor equipment in each costing \$14,000.

The roadway will be double track between Washington and Baltimore with a 2 per cent grade, which will permit of a maximum speed of seventy-two miles an hour and an average of sixty miles an hour between terminals.

To get a perfectly safe roadbed for this fast service an enormous amount of excavation and filling in grades is necessary. It is estimated that fully 1,000,000 cubic yards of earth will have been moved in the preparation of the grade for the falls.

To conserve speed and safety over the terminals is always the monumental task in the building of a railroad. In entering Baltimore the Washington, Baltimore & Annapolis has erected an immense steel viaduct and bridge, carrying the road over the several main and branch line tracks of the Baltimore & Ohio and the Pennsylvania.

All of the highway and railroad crossings are under or over grade, with concrete abutments, and the trolley cars will have an absolutely clear right-of-way from city to city, with not a single crossing at grade to impede the high speed desired.

Check on Telephone Buses. The latest invention to protect telephone companies from long-winded users of their lines and at the same time to prevent their patrons from being cheated is a wonder, says the Philadelphia Record. Although the new attachments have not yet been placed in the ordinary pay stations, they

will most likely be introduced in the near future, as they are rapidly being perfected. The patron drops in his nickel when the attachments are in place before he can get the central office, and he talks to the operator over one wire. Then, when the operator gets the connection completed she switches him to another wire, over which he talks to the person called. The instant he begins talking on the second wire a clock starts and at the end of five minutes breaks the connection, but it can be renewed with another nickel without both parties being central. If central fails to connect the patron with the party called the nickel rolls down a chute in front of him as the operator calls, "They don't answer."

Seeking Freight Business. The latest electric railway to seek the privilege of carrying express matter and freight is the Boston Elevated company, which has petitioned the Boston city government and the Brookline selectmen under the permissive statute enacted a year or two ago. It will meet with strong opposition, it is said, both from the various suburban express interests about Boston and the steam roads, for the latter realize that a grant of the privilege to the Boston street railway system will clear the way for establishing an express and small freight service over all the electric lines connecting out from Boston. Thus the Boston & Worcester Electric Railway company has already secured the privilege, but cannot use it because it depends upon Boston Elevated company trackage to get into that city.

Music by Wireless Telegraph. Music, conversation and telegraphic signals from a steamship in the bay were transmitted by wireless and heard through an ordinary telephone receiver in a room in the top floor of the Normandie hotel, New York, the other afternoon. Dr. Lee DeForest, inventor of a wireless telegraph system, gave a public demonstration of apparatus for the adaptation of the wireless method to the telephone. Music was transmitted by wireless from Telharmonic hall, Thirty-ninth street and Broadway, by the New York Electric Music company, and was plainly heard through a telephone and wireless receiver installed in the hotel, a block away. Through the same telephone the operator manipulating the telharmonic apparatus in Thirty-ninth street announced what selections would be played, asked what selections should be started and stopped, and was distinctly heard in Thirty-eighth street by the several persons gathered to witness the test. That the steamship's wireless should have cut in was an accident. Its apparatus happened to be attuned in accord with that in the

Normandie, and the hiss of the wireless apparatus miles at sea shot among the melodies of Mendelssohn's "Spring Song" and others airs. Keeping their purpose a secret at first, the Telharmonic hall management and Dr. DeForest pointed out that, while from all the viewpoints of steam railroading the Woodlawn curve was safe enough, the low elevation of the outside end of the ties was not sufficient for the electrical locomotives, whose horses power is nearly twice that of locomotives operated by steam.

The statement adds: "Evidently there existed in the ill-fated train some novel conditions which were sufficient to cause the wreck, and one does not have to look very closely into the matter to find ample evidence that the new conditions were to be found in the heavy concentrated weight and low center of gravity of the electric locomotives, and the enormous horse power, between 5,000 and 7,000, which the motor had at command. The center of the steam boiler of the present expresses of the New York Central road is about nine feet six inches above the track, and when the engine lurches against the outer rails of a curve there is something of a cushioning effect due to the fact that the weights are relatively high. But in the electric locomotive the heavy motors are placed concentrically around the axles, the wheels are small in diameter, and the massive frame is hung low, with the result that there is a heavy concentration of weight near the rails. Moreover, the heavy motors are fixed rigidly upon the axles.

"Taken altogether, it can be seen that the lateral hammering effect against the outer rail must be very much more severe in the electric than in the steam locomotive."

Electricity Versus Steam. The steady advance of electricity as a factor in the transportation problem in this country was emphasized in papers presented at a late meeting of the American Institute of Engineers in New York. Lewis H. Stillwell and Henry St. Clair Putnam discussed the substitution of electricity for steam from different points of view and laid particular stress on the advantages of the electric motor over the steam locomotive.

Mr. Stillwell in the beginning of his address declared not experimentally or hopefully, but as a fact that the electric motor may so far as science is concerned be well substituted for the steam locomotive engine. For already both the three phase and the single phase alternating current railway motors are perfected so that they may confidently challenge the steam locomotive. That challenge extends not merely to passenger traffic, but to that involving long-haul freight service. The direct current motor, too, has demonstrated

impressively. Mr. Stillwell asserts, and upon a great scale, its superiority to the steam locomotive in operating single cars and short trains and even in frequent and heavy passenger service in which the length of the train is limited only by the length of the station platform. Or to illustrate, in the New York subway, whose operations made possible many of the investigations carried on by Mr. Stillwell, eight car trains weighing 320 tons are in operation, equipped with motors which develop traction power that is fully equivalent to a drawbar pull such as steam locomotives exert of 5,000 power.

So, also, on the Erie railroad the heaviest locomotive, exclusive of tender, weighs 206,000 pounds, of which a little over 50 per cent is effective upon the drivers of the locomotives. Therefore, the motors of the eight cars of the electric train of the subway exert a traction energy equivalent to more than twice the drawbar pull of the Erie locomotive.

Mr. Stillwell asserts that if all the railways of the United States were now operated by electricity, and particularly if operated by the use of the single phase alternating current system at the potential adopted for the equipment of the New Haven railroad, the aggregate cost of the operation as compared with the cost of present operation would be reduced about \$250,000,000. This practically would pay the cost of the generation of electric energy, so that from this point of view the saving in the operation of the railroads of the United States by electricity of the system and the apparatus described would be so great as in comparison with the cost of the present operation practically to eliminate the cost of the power houses.

Regarding the reliability of train service the records of the elevated railways in New York City, which were run by steam from 1872 until 1902, and since then by electricity, are cited. That there is an increased capacity of line is claimed by the argument that electric traction as compared with steam enables the development of much greater sustained tractive efforts with given weight on drivers by reason of more uniform rotation effort. The frequency of stops is also claimed as an advantage.

After a long discussion of the relative cost of operating various systems, with an elaborate summary of cost of maintenance of way and structures and of maintenance of equipment, including transportation and general expenses, the conclusion is

drawn that the operation by electricity costs 18 per cent less than by steam.

Regarding the general comfort of passengers the argument is: "The great advantages of electric traction in respect to comfort of passengers are well known. Cleanliness and improved ventilation made possible by the elimination of smoke and cinders; lighting practically without heat and at low cost by a system which makes it easy to place lamps in any desired location, and heating apparatus effectively and conveniently controlled, are factors of very great importance in building up passenger business under conditions of competition. In operating through tunnels, ventilated with difficulty, the electric motor, in eliminating smoke and the gases of combustion, possesses an advantage which is frequently controlling."

Electricity on the Rand. The company which is proposing to supply the mines in the Rand with electric power from the Victoria falls, 700 miles away, hopes to have its system at work inside of two or three years. The power developed by the falls is almost inexhaustible. The width of the river at that point is 1,300 yards, and the drop is more than 60 feet. At the bottom of the falls the river is, as it were, shut in by another high ledge, and the whole of the enormous volume of water rushes through a narrow gorge for several miles. There is no such natural concentration of water power anywhere else in the world, and it is this power which the company designs to tap. It is interesting to note that the necessary buildings and works are constructed so as in no way to impair the beauty of the most stupendous spectacle in the continent of Africa. The power house will be situated 500 feet below the falls and will be completely out of sight. Here the electricity will be generated and driven through cables suspended on steel towers 1,000 feet apart over 60 miles of practically uninhabited country to the suburbs of Johannesburg. The pressure of the current is still a matter to be decided, but one of no less than 150,000 volts is contemplated. To deal with fluctuations in the matter of supply and to prevent the waste of power, the generation of which is necessarily continuous, all spare power will be used to pump water into a reservoir at the top of a high hill, where it will constitute a reserve supply of energy. By allowing the water to run down again to the bottom of the hill artificial waterfalls will be created, which can be utilized whenever necessary for the regeneration of power.

Meat-Eaters Have Done Things to Make the World What It Is

PROF. IRVING FISHER of Yale, after exhaustive experiment upon forty-nine students, professors and physicians, finds that the non-meat eaters outlast the meat eaters in such tests of physical endurance as holding the arms out horizontally against time, deep knee-bending and goose-step drill. One vegetarian held his arms out more than three hours, while a meat-eating track athlete quit in nine minutes. Now, men do not make a living by holding their arms out horizontally, yet it may be admitted that most people can get along very well as individuals without meat. Prosperous Americans who lead a sedentary life eat far too much of it. But that does not prove the case in its wider aspects.

History is half made up of the conquests of vegetarian or semi-vegetarian nations by meat-eating ones. The meat-eating Iroquois Indians of central New York held the fish-eating Shawanahkas of Long Island in subjection. The buffalo-chasing Sioux were more doughty warriors than the Chinooks. The Goths that overran Spain, the Mohammedans that conquered the vegetarian Buddhists of India, the Normans that made their name feared from England all the way to Greece, were valiant trenchermen. In later days the

Englishmen—"five-meal, meat-fed men." Kipling calls them—have ruled an area fifty times as great as their own chill island home.

Nature does things wastefully. Meat-eating may not nourish an enduring body, but nature does not mind that. It is nothing to her that a few thousand fat-waisted men of affairs dig their graves with their teeth in city restaurants; there are plenty of rosy-cheeked country lads to take their places. A superabundant diet feeds the nerves; it imparts the lick for action; it rouses or sustains the combative instinct. The grumbling Briton goes bated, perhaps, but respected for his fighting spirit, where the philosophic Hindu, whose religion teaches the sacredness of animal life, is ruled in millions by a corporal's guard.

Meat makes his esters quarrelsome, they say. Japanese school boys, though brave and sensitive to a point of honor, do not fight about trifles like English or American lads. And though vegetarian Japan defeated carnivorous Russia in war, Japanese army physicians have put meat into the military diet to cure beri-beri. It is probable that meat is not necessary to the contemplative mind of a Kant or an Emerson. But could there have been Washington without it?—New York World.

King Ak-Sar-Ben in Land of the Pharaohs



MR. AND MRS. GOULD DIETZ OF OMAHA AT THE PYRAMIDS.

Sleeping Giant of Asia Perfecting an Army that May Be a Wonder

TODAY China's soldiers are armed with the best products of German and Japanese skill. They are trained by Japanese officers in strategy and tactics. They are equipped with signal balloons, wireless telegraphy and a Red Cross society.

Their officers are graduates of excellent military schools, established in various parts of the empire, in the faculties of which are to be found a large proportion of German and Japanese instructors. Modern history has but one other example of a nation so thoroughly, so rapidly, and so earnestly renovating an antiquated and useless military system as China. That example is Japan.

China's army is en route to perfection. Will it arrive? Has it worried by the way? Is the march ahead of too great a distance? These are the questions now asked as the result of the second annual maneuvers of the Chinese imperial army, which took place near Chung-tai Pe.

As was said by one of the experts: "The maneuvers were good, but not startling. They were more or less of a disappointment, near those who came to see remained to praise."

"Enough could not be said in approbation. The press went mad. The yellow peril was imminent—at hand, in fact. All Europe was agitated. America wondered

and the world at large entertained new ideas of China and its army.

"This year there was no illusion. Critics came to criticize, as they thought, a night-club army; they realized how unfair they had been.

"They found that China had not produced a modern army, as western countries understand the term; that conditions, as found in China, were too great a handicap; that its army, as a homogeneous unit, does not exist; that it is quasi-imperial and subject to the forces of the empire, and that therefore the present day standing of western nations cannot be applied."

Other critics look upon China's military forces with indifference. "They regard the Chinese soldier with contempt, no longer. He has proved his capability. His discipline is excellent.

"Give me a few thousand of such men," said one attaché, "and I would not be afraid to march from Peking to Canton in the face of any opposition that China at present can produce."

When it is remembered that these same soldiers which are now called for the admiration of the military critics of ten nations were only yesterday the spearmen of China's antediluvian army, and as such the expression of its anachronistic art, one is able to grasp the progress which China has made toward military regeneration.—Harper's Weekly.