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THE PEOPLE'S INTEREST IN WATER-POWER RESOURCES.[1]

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The people's interest in water power is served only through use. Since flowing water is a continuing source of power the contribution of this resource to the public welfare is proportionate to the promptness and efficiency of the development of every power site. Wherever the resulting energy can be put to work at a cost justified by results nonuse of a water power is an economic waste. It is well, however, to qualify the statement of an eminent authority that from the conservation standpoint "any use is better than no use at all."[2] A more farsighted view is desirable; better not even a partial development now if thereby the full utilization that may be needed in the near future is blocked.

From the standpoint of the public what is needed in water-power utilization is efficient development that will meet present market demands and effective regulation that will secure to all the parties interested a participation in the benefits of that development. This may seem a simple program, but its large importance comes from the fact that water-power resources will possess much greater value to society in the future.

The stage at which we find power development on the public-owned sites to-day is simply this, as described by Secretary Lane in his recent report: "The Government was generous, but it had no intention of being a spendthrift. When it found itself being imposed upon * * * the Nation stayed its hand and drew back, so as to make sure of the right course. It wished use—use by as many as possible and the best use."

[1] Delivered before the Second Pan-American Scientific Congress, Washington, Dec. 28, 1915.

[2] Swain, G. F., Conservation of water by storage, p. 27, New Haven, 1915.

It is this logical desire for the best use, in which the largest possible number may share, that makes the utilization of water power a live issue. Unwarranted fear of impending monopoly may have led some to urge a halt in all development, while blind disregard of a changing order of things has caused others to denounce any restriction. The practical observer of the times, however, recognizes a greater danger of monopoly because of nondevelopment and a larger security through regulation.

The engineering fact that stands out in the utilization of water power is the comparatively high efficiency of large systems. Lower costs of operation and better service are results that appear to follow naturally the creation of these combinations of power plants.

The combination of several water powers differing in character in order to serve many markets having diversified service requirements makes possible an economic adjustment of supply to demand, and thus the result is a natural tendency to State-wide and even interstate units of operation. Nature's irregularities are thus equalized and man's varied requirements are similarly balanced. The Western States, in which these large hydroelectric systems have been mainly developed, show the largest per capita consumption of power and the lowest average rates. The centralization of power development is accompanied by a large market and diversified use; and the resulting high-load factor has made possible low rates, which in turn have encouraged the more general use of power, until in a State like Montana, which leads in per capita consumption, the people put electric energy to every use on the ranch and in the home, while in the mines and smelters and on the railroads electricity is displacing steam. The influence of this cheaper power on the mining industry, for instance, can be realized in part by considering the fact that one mining company, by substituting hydroelectric power for steam, effected an annual saving of nearly $2,000,000. Translated into terms of copper ore, this means a saving of about 50 cents on a ton of ore, thus permitting the mining, with an equal profit, of ore that much lower in grade than could be mined when steam-generated power was used. This illustrates the wide public interest that may be served through the efficient operation of large units. Conservation of this sort means much to the whole Nation.

Such are the advantages to the people that are possible through hydroelectric development as a natural monopoly; it remains to make the possible advantages actual. It is the recognition of this interdependence of the corporation serving the people and of the people served by the corporation that has developed, only in the last eight years, this idea of effective regulation of public utilities. In the illustration just used there exists a certain community of interest between the power corporation and the mining company. The moral is plain—

a similar community of interest needs only to be created between the public utility company and the people it serves.

If the subject for discussion is the constitutional basis for public control of water-power resources, the opportunity is large for those who look backward over the decades of progress; but the purpose of public control is a simpler topic, which can be discussed by those who see clearly present conditions and look forward to the time when full utilization of every natural resource will become more essential to society.

The oft-debated question whether the relation of the Federal Government to water-power sites is that of proprietor or that of sovereign is only incidental to the real issue of the people's larger interest as the consumers of power. Herein lies the purpose of certain legislative proposals that have been misunderstood by some and perhaps misrepresented by others. What has been termed an arbitrary control is not an attempt to sell something the public does not possess, but an effort to protect and safeguard the future interest of the public consumer. Whatever the governmental agency, Federal, State, or municipal, any or all will become more and more active in the public interest. The method of control may be based upon public ownership of land, police powers, or preservation of navigation; the primary results sought will be public protection. Once certain natural monopolies were recognized as the proper possession of the sovereign prince; later the divine right was regarded as inherent in certain large corporations; to-day the sovereign people have begun to claim a share in the benefits that naturally flow from a natural monopoly. These public utilities are in the natural-monopoly class simply because the community requires centralized service; a large part of the value of the monopoly originates in the community, and the people's right to a share in the benefits is therefore fundamental.

The New York Public Service Commission had under consideration two years ago the question whether a hydroelectric company had the vested right to sell low-cost Niagara-generated energy at the price of high-cost steam-generated energy and pocket the profits. The decision was plain enough to settle this issue wherever it may be raised. Recognizing fully the claims of the company for a liberal return upon its capital invested, the commission concluded its discussion of the case with these words:[1]

> But to say that the public is entitled to no advantage from the use of these waters, that the territory which can be served with electric energy developed at Niagara Falls has no advantage and is entitled to no benefit by reason of proximity to those Falls, is to say something which does not appeal to the best judgment of mankind for an instant.

[1] New York State Pub. Service Comm., Second Dist., Reports of decisions, vol. 3, p. 671, April 2, 1913.

Engineering skill has created through the turbine and the long-distance transmission line a public utility of the first rank; it is now a problem in social economics to secure for the people the real advantages of these modern inventions. Too often in the past the wealth won by the engineer from the mine, the forest, or the stream has been monopolized by the capitalist. Experience is teaching the American people to regard industrial development as a public matter, in which others than owners of stocks and bonds are concerned.

Too often the public interest in water-power resources has been discussed almost wholly in terms of compensation, tolls, and charges for the publicly owned resources utilized. The revenue idea connected with this conservation issue has been allowed to overshadow the thought of control in the public interest. A notable exception to this tendency is contained in the Pend Oreille permit issued in 1913 by Secretary Lane, which provides that after the ten years allowed for construction of plant and development of market the rate of compensation to the Government shall vary inversely as the square of the proportional development of the site and directly as the square of the average price charged for electric energy to both customers and consumers. While protection of the ultimate consumer is the purpose of these terms, the return to the Government, as will be seen, is determined by the receipts of the operator. Here the objects plainly sought are prompt and complete development and low rates to the public rather than revenue to the Government.

The most notable sign of the times is the general acceptance of the principle of public control. A recent editorial in the Stone & Webster Public Service Journal[1] thus sums up the whole issue:

> Still, it is a fact that public regulation has come to stay, and when its methods are reduced to the scale of absolute justice and sound economics it should prove of inestimable advantage to the country.

When applied to water-power resources, as to other public utilities, regulation by public agencies needs to begin in the initial stages of development. The terms of the contract between the public consumer of electric energy and the private builder of the hydroelectric plant can best be considered before a stone is laid.

No appeal for public welfare should obtain a large hearing that fails to express an equal desire to do justice to the individual or corporate owner as well as to society in general. Hence, in any discussion of the future conduct of the water-power business, one of the essential premises is the condition of proper return. This idea is at the foundation of public regulation of private business, but even beneath this is the query, A fair return upon what? Thus it is that

[1] Oct. 15, 1915, p. 230.

in considering the social side of an engineering subject like water power, we find ourselves confronted by questions of capitalization and valuation. From the technical discussion of rates measured in cents per kilowatt-hour we turn to the economic questions of equities based upon "intangibles."

The present trend in the determination of the proper basis for rate regulation appears to be away from valuations derived either from cost reproduction or from capitalization or current stock-market quotations of the securities. As stated by Commissioner Lane in the decision of the Interstate Commerce Commission in the Western Advance Rate case:[1]

> Perhaps the nearest approximation to the fair standard is that of bona fide investment—the sacrifice made by the owners of the property—considering as part of the investment any shortage of return that there may be in the early years of the enterprise. Upon this, taking the life history of the road through a number of years, its promoters are entitled to a reasonable return. This, however, manifestly is limited; for a return should not be given upon wastefulness, mismanagement, or poor judgment, and always there is present the restriction that no more than a reasonable rate shall be charged.

The same thought was expressed by Commissioner Thelen, of the California Commission,[2] in these words:

> After a consideration of these and other fine-spun theories, the mind of a practical man instinctively turns for first guidance to the simple question of the amount of money which has been honestly and wisely invested.

And to show that this idea is winning nation-wide acceptance, an even later opinion by the Massachusetts Public Service Commission may be quoted as setting forth the guiding principle of regulation—that both the public using the public utility and the public investing in the utility company are best served when the effort is "to protect investments honestly and prudently made and wisely managed." The Massachusetts commissioners[3] declare that—

> Any other theory involves essential injustice; tends to make the development of our public utility companies a speculation and not an investment; operates as a premium upon various kinds of fraud; invites into the public service undesirable manipulators instead of sound, level-headed business managers; * * *
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> Accordingly, we rule that under Massachusetts law capital honestly and prudently invested must, under normal conditions, be taken as the controlling factor in fixing the basis for computing fair and reasonable rates; that if there is mismanagement causing loss such loss must be charged against the stockholders legally responsible for the mismanagement.

There is, however, another side to the justly condemned system of watered stock. In the past "water" of this type has represented in

[1] Feb. 22, 1911: Interstate Commerce Comm. Decisions, vol. 20, p. 347.
[2] Railroad Comm. California Decisions, vol. 6, p. —, 1914.
[3] Massachusetts Pub. Service Comm., vol. 2, pp. 108–111, 1914.

a way the capitalization of the risk, so that if the financing of a public-utility project is now to be put upon the sound basis of actual cash received and expended, the risk element inherent in an engineering venture of this kind, especially in its early stages, must be recognized and provided for. This provision can be made only by permitting returns to invested capital at rates much higher than the return on municipal bonds. The possible profits must be adjusted to the possible risks.

This recognition of the economic justice of a higher rate of profit must look ahead to future operation as well as back upon the period of construction. If under commission regulation the so-called "unearned increment" is not to accumulate as a basis for future rate making, then some other premium must be placed upon successful operation.

The practical ideal in public regulation is to allow such returns to the private owner and operator as may encourage engineering and executive efficiency. To fix a maximum rate of profit based simply on capital investment might effectually veto improvement in plant or operation beyond the dead line thus established; therefore, the prize of a larger return must be held out to those who make the largest and best use of the natural resource. In the absence of the competitive element the returns to be derived by the private holder of a natural monopoly should be restricted so far as they depend primarily upon his use of the resource which society owns or to which society gives value, but a quite different method of regulation may well be applied to the profits that come from his continued investment of gray matter. Such ability and industry need not be capitalized, yet betterment of service should produce benefits in which both investor and consumer may share.

Adequate incentive to greater efficiency combined with full recognition of the people's interest may be provided by any of several methods: the sliding-scale plan adopted for the Boston gas companies makes larger dividends to stockholders contingent on lower prices to consumers; the Chicago street-railway ordinance provides for the division of profits above the fixed rate between the company and the public; a profit-sharing plan worked out by the manager of a Wisconsin power company divided excess net profits equally between the company and the consumers. In each of these plans the principle is the same; the investing public and the consuming public are partners in the enterprise, and the duty of the Government is to exercise its protective power in the interest of the private owner of a public utility no less and no more than in the interest of the public user of that utility.

It is in the streams and rivers and the sites adjacent to them that the people have the largest interest as the future source of power. The present installation of water-power plants in the United States is estimated at 8,500,000 horsepower, representing a probable investment of nearly a billion dollars—exclusive of transmission and distribution systems. The estimated undeveloped power possible without storage in the country, exclusive of Alaska, amounts to 55,000,000 horsepower, one-half of which is on publicly owned sites. For much of this power there are no available markets, and under present conditions development would not be feasible; yet these estimates afford at least a qualitative expression of future possibilities.

Of the two fuels that can be considered as the competitors of water in power generation, petroleum has probably already passed its maximum of production, and the life of this source of power is to be measured by only a few decades. The coal resources of this country, on the other hand, are so large as to promise an abundance of fuel for scores of generations. Yet the price of steam coal shows a steady advance, offset, it is true, by increased efficiency in steam generation and utilization, but eventually the relative importance of water power the country over must increase.

Already the great development of hydroelectric power in California in competition with oil and in Montana in competition with coal forecasts the future relation of industry to this source of power. In these and adjoining States irrigation and mining and transportation depend in larger measure each year upon hydroelectric energy, and it is because of this increasing contribution to the industrial life of the Nation that public service and public utilities are more than names when applied to the utilization of water power.

In considering the future of water power it is important to note that because it utilizes a nonexpendible resource, hydroelectric energy, unlike coal or oil, needs no allowance for amortization, but its price to the consumer can be based directly on its cost to the operator. Herein lies the public interest in every phase of present-day regulation of water-power development that may affect future cost of water-generated energy. It is simply national foresight to see to it that the public utilities organized to-day for private operation do not include promoters' hopes or speculative land values in the capitalization upon which future power users might be asked to pay returns. It has been aptly said that "the public utility is not formed to speculate in land."

Cheap power promises to be in some future century this country's largest asset in the industrial rivalry among nations. Our unsurpassed coal reserves reinforced by these water-power resources constitute a strong line of national defense in that they form the real

basis for an industrial organization of the Nation's workers. It is only through abundant and well-distributed power that the other material resources of the country can be put to their highest use and made to count most in the Nation's development. The people's interest in water power is greatest in its promise of future social progress, and such an interest is well worth protecting.