THE EFFECT OF SOCIETY ON THE ELECTRIC POWER INDUSTRY

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CONTENTS

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MR. SWAREN: Gentlemen of the college: Man, since the dawn of intelligence, has striven to increase the power of his unaided muscles. You have been told from this platform that these muscles can develop about 0.1 horsepower. Some of you who visited the General Electric train may have won a cigar by lighting a 40-watt lamp for a brief instant. Electric power is as ubiquitous as water, as necessary as food, in our daily life.

Succeeding lectures and seminars will bring you more specific details of this vast industry which we accept as part of the American scene, the American way of life, if you will.

This morning I want to examine briefly a few effects of the American way on this industry, to show how society has conditioned the growth of this lusty youngster. For it has followed a different pattern in our Nation from its patterns elsewhere. Much of the societal development that now exerts an unremitting influence on the industry has a lineage reaching beyond the beginnings of written history. Some has been drawn into the American pattern in very recent times, so recent that certain phases have not yet been digested. In fact, these may not be digested, but may bring about a vast change in our Nation.

I want to show how these mores have adjusted to the offspring of science and skill, then bent that technology to the use of society.

Obviously these effects are numerous. I propose to touch on a very few.

The power industry is founded on the principle that mechanical effort can be transformed into an electrical impulse, conveyed over conductors, and again transformed into mechanical effort, or some other manifestation of energy. There are many other ways of setting in motion an electric impulse, but this principle of the mechanical prime mover is the only one now of importance in the industry we are considering. Likewise, of the many types of prime movers, only two so far have become dominant in the industry--the expansive power of steam and the energy released by the gravitational flow of water.

Again, because of time, I shall talk only of the effects of society expressed through its control of water.

Water has been considered a chattel of society in all civilizations. Here in the United States two conflicting philosophies of this chattelship have played tremendous parts in the industry we are considering.

One of these stems from the prehistoric use of crude water wheels in the vicinity of central Europe, now known as Yugoslavia. The basic food supply of these areas was, and still is, cereals. Like all peoples living in eyeshot of mountains, many of the inhabitants were miners. The climate is continental. At certain seasons of the year stream flow is a flood many times the volume of the dry periods. Several months of the year the flow is low, equable, and gradually diminishing. Mills were necessary to grind the grain and hammer the ores. These were driven by several types of water wheels, but all dependent on using the water from a considerable height.

Obviously, mere stream gradient did not suffice; and the water was diverted from its natural course, carried to the mill, and allowed to escape to a lower level, perhaps even into another watercourse. It is equally obvious that at seasons of low flow, there might not be sufficient water to supply all mills. So arose the custom that the man who had first diverted the water to a useful purpose was entitled to utilize as much as was necessary for his wheel--but no more--even though someone further upstream, who had built his mill at a later date, might not have enough water to operate, and would be required to shut down during these low-flow periods. So was the inception of the legal philosophy that he who first put to work the water of a stream had preemptory rights to as much water as his devices could put to use.

This right of preemptory use spread slowly down the Italian peninsula, thence across the Mediterranean into North Africa, and, with modifications, was adopted by the Moors. By these it was carried into Spain. All along the line it was accumulating minor modifications to meet local conditions. These modifications were expressed in judgments--of the tribal chieftains, of the local Roman councils, and lastly, by the famous water courts that to this day sit in judgment each Sunday in the rural churchyards of southeastern Spain.

In due time these water laws came with the Spaniards to America. Over much of Mexico and California, climate and precipitation cycle required not too many modifications to provide an equitable distribution of the water, used here primarily for irrigation, as it had been in Africa and in Spain. As a result, when the forty-niners came, they found at hand a philosophy of water use that well fitted their lusty ideas of propriety. Only too often the man who first made beneficial use of the water was cast aside for the strongest man who wanted to use it, or perhaps the most greedy, who grabbed far more than the stream could supply. But these were the foundations of western water laws, which spread wherever mining led the way, and irrigation followed.

But there was one important modification, far-reaching in its effect on the power industry, stemming from an entirely different concept of society toward water flowing in streams. I would like to trace briefly the origin of this second concept and its marriage to the one I have been discussing. Further on, I will describe a new concept of water flowing in streams which is born of this union.

Most of the forty-niners were from the Atlantic seaboard. Their mores were modifications of those of England. The water laws of their homes were founded on the British common law. Much of this is unwritten.

The weather of the British Isles creates an entirely different cycle of flow from that of the continent. Likewise its prehistoric inhabitants were essentially meat eaters. Climate and soil were conducive to the production of meat animals rather than cereals. In such a husbandry water for animals became a paramount necessity. So custom soon became fixed that the upstream owner must do nothing that interfered with water for cattle of the lower owners. This principle may be expressed in the statement that the riparian owner may utilize the water flowing by his land, but must return it to the stream bed undiminished in quantity or quality, excepting domestic uses, before the stream leaves his premises.

Domestic use embodies two basic exemptions paramount to this principle. First, the riparian owner may diminish the stream for domestic purposes, including the watering of cattle. However late he becomes a riparian owner, if his domestic requirements absorb the entire natural flow, the lower owner, regardless of length of prior usage, has no prior right. Some decisions have modified this extreme.

The other right is that of navigation. This in reality stemmed from foreshore rights, or rights to fish in tidal waters. Few streams in Britain are navigable, except the tidal streams. But the bed and waters of tidal rivers are deemed the property of the Crown, therefore usable by the public; while the bed and waters of nontidal waters are the property of the riparian owners.

At this point I want to digress for a brief lesson in semantics. Earlier I spoke of the diversion of water for beneficial use, and I said that custom and law almost universally considered water a chattel of society, or the state. Now, under the theory of appropriation, society is divested of its ownership, and the water--a physical, measurable quantity of it--becomes the property of an individual, who may use it as he pleases. But in speaking of the English law I have used the term "waters" as the property of the riparian owners. This does not mean actual, physical, measurable quantities of water, but merely the benefits which accrue because this body of water is contiguous to the property of the riparian owner.

To return now to the trend of my subject, when settlers came to the seaboard colonies, all of these customs and laws migrated in greater or less degree. However, many streams intersected both the foreshore lands and the hinterlands. Most of these were navigable--if not by the vessels common to England, at least by the canoes of the Indians or in springtime spate by logs of the sawyer.

These same streams promised power to the sawyer to relieve the toil of pit sawing. So for the first time we find frequent conflict between two or more interests in these supposedly well-established rights. The first reduction to code was by the burgess of Virginia in its session of 1640, which passed the first law governing a portion of what is now the United States, having to do with the construction of power dams, and the rights and limitations of other parties having an interest in stream flow. By the time of the California gold rush, much detailed law and decision had been written, but with no material change in principle. In fact, this principle still controls in most eastern states, although a new rule based on Federal enactment, of which I shall speak later, is coming into use.

When these two theorems of water use met, it was so completely apparent that the principle of prior appropriation was the only method by which water could be conveyed to the mining claims that every community adopted a code suitable for its needs. Thus came about the incredible variations of mining water laws in the West--with a multitude of restrictions, methods of measurement, posting of notice, effect of abandonment, and other provisions ad infinitum so useful to the pocketbooks of barrel-head lawyers. These were codified by state and territorial legislatures, and finally in part by Federal mining and irrigation laws.

But one element was contributed by the common law. It held that the stream flow must be returned to the natural watercourse before it left the tenement of the riparian owner. Slightly modified to state that the water must be returned to a natural watercourse, and that the lower owner must receive any water so discharged, this precept engendered a psychological reaction that to this day is a major element of discord between society as a whole and the power industry which serves it.

For the water returned by the miner to a natural watercourse was not merely water. It carried a burden. Seldom less than 10 percent, often as high as 25 percent, it carried silt and gravel--mining debris. Soon lower channels were choked and flood waters spread over farm land and orchard, rendering many fruitful valleys little more than wasteland. But farmers have always been highly vocal where their rights, fancied or real, are invaded. The miners fought back. First the legislatures were the battleground. Not many years were consumed in getting debris laws on the books, only to engender years of bitter litigation, ending in complete victory for the lower owners.

But long before this, water supply had been consolidated in the hands of large companies, operating over wide areas, diverting the flow of major streams by expensive dams and a complicated grid of canals, flumes, and ditches. Once the water of these works reverted to the original streams, these expensive structures would be valueless. Irrigation of course was possible.

It was about this time that Edison had proved the economic potential of the electric central station in his Pearl Street project. But the inherent limitation of his system--the three-wire direct current--confined its operations to urban areas; and these water structures were of the mountains and the wilderness.

However, Tesla, the great dreamer, and Ferranti, the skilled engineer, one in Pittsburgh and the other in London, were developing the principles of the transformer and the polyphase motor. Certain visionary leaders of the obsolescent mining water companies grasped at these straws of possible transmission of electric power generated by their wasting, useless water. Several places in the West claim the honor of first turning water into power for long-distance transmission. Whether the honor belongs to Mill Creek, near Los Angeles, or a sawmill near Eugene, it was water from an old miner's ditch, driving a water wheel invented by a mining ne'er-do-well, that powered these early experiments.

In so doing, there was carried into the new industry a part of that element of antagonism which the general public so continuously voices against public utilities in general and electric power systems in particular--the rancor engendered by mining debris. Nor did the new industry go far to soothe this rancor. Instead, it introduced a new one. Its poles, carrying the mysterious conductors that were bringing new measures of luxury to the city, marched majestically across the land, never deigning to halt at the farmhouse in its shadow. "Economic reasons," so the power man said, giving no heed to any social obligation.

For fifty years many plans to overcome the economic barriers to rural power service were advanced. Some by more farsighted men of the industry, others by men who had the interests of rural society at heart, and others who saw this another opportunity to turn the power of society toward socialism, and nationalization, Marxism, or whatever term you care to apply.

Unless the strife of war or strike brings about nationalization of certain other industries, I fear the first industry of the United States to become completely owned by society will be the power industry. And the foundation for this movement will be our agricultural population, not the industrial giants who seek subsidy through tax-exempted low rates.

From this point of departure--and it is a point germane to my title--I want to turn to a new concept of water resources and societal relationships. Much of the water passing through powerhouses still had

sufficient elevation for irrigating lower lands. In fact, the original Reclamation Act contemplated power as a by-product of the irrigation operations.

Visionary though they were called, truly farsighted engineers contemplated full use of water from the mountains, first abstracting all energy economically feasible, then spreading the water on the land as irrigation, and lengthening the irrigation season by a storage of winter rain and spring snow melt in reservoirs, thus allowing little or no water to reach the sea by natural watercourses, even eliminating the springtime floods.

From this conception of multiple use grew portions of our reclamation laws, and of our flood control laws, often conflicting. While these concepts were growing, other concepts engendered by ruthless exploitation of timberland, mineral resources, and grazing country were receiving attention from many groups.

Stretching the rights expressed by the various water laws, millions of dollars were being poured into construction of power plants and transmission networks. It was not difficult to tie these into the earlier principle that flowing water is a chattel of society, and that these power sites were pictured as the last great natural resource left to the people.

These ideas, combined with lesser, more localized concepts, have crystallized into the concept that a river system, from mountain rivulet and back pasture branch to its final discharge into the ocean, is a single entity and should be so treated in planning, development, and final operation. Piecemeal legislation made the first steps toward realization of this concept. First was regulatory authority implied in permit to cross Federal lands with any structure of a power system. This was followed by the Federal Power Act, which has been expanded to cover any water affecting navigation. Court decisions have further broadened this concept, until a boy putting a flutter wheel into a spating branch legally could be required to obtain a license from the Power Commission as interfering with the flow of a stream which in turn flows into navigable waters.

In passing I want to credit the Power Commission with considerable restraint in administering its broad powers. It is a matter of record that it dismisses for lack of jurisdiction more applications than it accepts. This may be a backhanded way of exercising jurisdiction.

How administration of this river concept with its many contradictions will ultimately be encompassed by the society which it serves is not apparent at present. In some river areas certain Federal agencies are cooperating, while in other areas the same agencies are almost diametrically opposed. State agencies almost without exception are in contest

with Federal departments; while local agencies, cities, utility districts, and smaller units, are more likely to look with favor on the Federal departments. And a new agency for the United States, the federally created administration, typified by the Tennessee Valley Authority, might well develop into a new, regional political entity, so completely is its thinking becoming integrated into the society which it serves. Nor are the investor-owned companies leaving the field. In fact, there are more private applications before the Commission today than by public bodies.

So far I have talked about physical areas of the industry, more especially one phase of society's impression on the generation of power through the medium of a state chattel. Even this small phase is compounded of an infinitude of detail. But I hope enough has been said to show that society has always seized on scientific advance and sooner or later has brought it to conform to what society deems most suitable for its own needs. I would now like to turn to another area of the industry, the area of economics, and to further confine these remarks to some portions of that phase encompassed by regulation. Here I want to indulge in another bit of semantic discussion.

"Regulation" and "control" are given as synonymous in the dictionary. "Regulation" in military parlance carries a connotation of exactness--a specific rule to meet conditions of much similitude. But to me, as it applies to the power industry, or other public services, it carries a different connotation. To me, in this field, it means the setting of limits beyond which the regulated action cannot go.

Thus, a regulation may state that the earnings of a company shall not exceed 7 percent annually. But it will not say these earnings must reach that figure; nor will it provide any technique of management to achieve that happy condition. Likewise, a more specific regulation may state that voltage on the system shall be "X" volts plus or minus "A" volts. It will not say what management shall do to achieve this degree of perfection in service.

On the other hand, a company may have in hand the sale of a security issue. Constituted societal authority may say to it that it cannot sell this offering to an individual buyer, but must put it up at public offer to the bidder making the most advantageous proposal. That is control. That is taking over a decision which is an attribute of management. Society may have many reasons, cogent reasons, to protect itself by such an edict, but in so doing also it should accept certain responsibilities of operation. I hope in our seminar on financial relations you will hear this feature discussed more fully.

Or a state or city commission may say to a power company: "Put a step-by-step regulator, with a range of 'A' volts plus or minus, by steps of 'B' volts, on a certain feeder." That is not a regulatory order, legal though it may be; it is control; it is managerial action.

I hope these rather pointed examples will indicate the narrow boundary which I feel exists between regulation and control exercised by commissions and boards through which society impresses its will on the industry. This area to which I now turn brings into society's impress an injection of another type of mores--that of the Germanic. The power industry had its beginnings in urban areas, with local governments. One of the first cities, only weeks after the Pearl Street demonstration, to have the beginning of one of the world's great power systems was Berlin.

The origin of franchises granting privileges to perform certain acts to the exclusion of others is lost in the mazes of political history. The Roman corn laws were a type of franchise. So were the charters of the colonial companies which settled America. The origin of the word appears to stem from the old French word "franc," meaning "free." So the holder of a franchise from a ruler or a governing authority was free to perform certain functions, to exercise certain privileges. Not only free in these rights, but protected against others.

Many types of franchises had been granted to entrepreneurs by town councils. But the franchise granted to the Berlin Electric Company in 1882 was the first franchise granted to a business entity whose purpose was the supplying of illumination through the medium of electricity. With characteristic Prussian meticulousness it covered every feature of the proposed enterprise.

In the United States, promoters--an optimistic type of entrepreneur--seized on this type of franchise to further the rapid introduction of this new industry. Complete protection in every detail, even to the utmost farthing in charges and collections, was assured the public.

These promoters, and their successors, solicitously lived up to the full level of these contracts so carefully conceived in the terms of the original French word--"franc," "free." Perhaps no more messy scandals in the American Government ever developed than grew out of some of these electric power franchises. All the more possible were such malfeasances as the language of the documents had not only carefully chosen legal verbiage, but was liberally besprinkled with esoteric terminology of the then mystic science of electricity.

But these franchises were firm contracts. Even higher echelons of government in any endeavor to abrogate their terms would have serious jurisdictional difficulties. So long as the power lines did not cross state boundaries, constitutional law confined any remedial legislature to rather limited areas. Wisconsin was the first state to grasp firmly the tail of this particular bear, by creation of a state public utility commission in 1907. Aided by the more farsighted utility officials, other states followed the commission idea, until every state and the District of Columbia now have regulatory bodies, some, however, with very limited power.

Regulation and control of business transactions, particularly the establishment of price levels, go back to earliest recorded history. But regulation of utilities in the United States has its roots no deeper than a decision handed down by the King's High Court of Justice in 1660. At that time Lord Hale was Chief Justice. Before him came a case in which a riparian owner had built a wharf extending into navigable waters permitting vessels to lay alongside and so discharge cargo. He endeavored to restrain certain vessel owners from so discharging cargo, though permitting others, in short, most of the public, to do so. Suit was brought to eliminate this ban against these certain boatmen.

Both parties were persistent, and eventually the case reached the High Court. Written and unwritten laws and cases reaching back to the very beginnings of English common law jurisprudence were cited. For some reason this particular case intrigued Lord Hale and he wrote the decision.

But apparently his interest did not cease with the decision. So he wrote one of those brilliant essays which centuries afterward established him as one of the great legal philosophers of the world. This essay was titled "De Portibus Maris," "The Ports of the Sea." The details of this essay are not of importance to us, but its theme is, for the whole trend of thought is centered around one statement--that "certain affairs are so affected with public interest that they become of public concern." They cease being jus privatum and become jus publicum; so Lord Hale wrote and carefully laid away on a day in the 1670's.

A hundred years later Lord Hargreaves was Lord Chief Justice, and in rummaging among the papers of his predecessors, came upon a number of unpublished essays of Lord Hale. Hale had been a prodigious scholar and a rather prolific publisher. Evidently, he thought these essays of little worth. However, Lord Hargreaves selected a group which he caused to be published in the 1780's, only again to sink into desuetude.

Then nearly a century later the state legislature of Illionis, a body heavily weighted with farmers, passed a law regulating the operation of grain elevators and fixing the charges for storage and elevator service. The grain elevator operators, a closely knit Chicago-dominated group, carried the case to the courts; and once again a momentous case having small origins was before the Supreme Court under the title "Munn vs. Illinois."

The brief for the state had been prepared by an obscure lawyer from the small farm town of Havanna. He had in his library a copy of Hargreaves' "Law Tracts." He had read carefully and thoughtfully the essay on the "Ports of the Sea." About that phrase--"affected with public interest"--he built his case. The court sustained him.

On Munn vs. Illinois is built the entire structure of commission regulation in the United States. The techniques there laid down have long been superseded. "Smythe vs. Ames," the Missouri Bell Telephone case, and the Hope Gas Company case have long since replaced Munn vs. Illinois for technique, but the principal there invoked is jurisdictional law of regulation.

Gentlemen, I hold in my hand the copy of Hargreaves' "Law Tracts" which was the property of the obscure lawyer in Havanna.

I wish time permitted tracing further impress of society on the industry. It would be of much interest to trace the processes by which ambitious men transferred the principle of leverage as a fiscal tool to that of managerial control through minority ownership of holding companies. How this house of cards collapsed in the late twenties and early thirties. How the public required the forging of rigorous laws--and more rigorous enforcement--establishing the Securities and Exchange Commission. More particularly, how the famous Section Eleven was forged--the widely advertised death sentence section. And how the basic interpretation of this section violated one of the long-established fundamental principles of sound investment. It would be more interesting to trace how, despite, perchance because of, this virile section, the power industry has grown into a group of lusty giants, strong financially as well as physically. Perhaps these will be developed more fully in our seminars on "Capacity to Serve" and on the "Financial Aspects of the Industry."

Perhaps you have speculated over the title of my talk. What relationship does society have to the problems of mobilization? Perhaps a mild bewilderment may exist in your minds as to why I have shown the early inception of certain well-known societal customs. However, a nation is but an enlarged community. Climate, soil, and propinquity create the mores of a nation, as they do those of a community. These mores are reduced to fundamental tenets, handed down by word of mouth and by written testament. Refined, clarified, stated succinctly, these become the philosophies of life, and philosophy is the distilled essence of man's experiences.

QUESTION: Is there anything on the credit side of the ledger that Sam Insull contributed to the development of power, or did everything he did have the effect of stopping the development of the industry?

MR. SWAREN: In the case of Samuel Insull there is a great deal on the credit side. He was one of the most able operators this Nation has ever seen. Every one of his companies since the failure has been very successful. Some of the other blue-sky operators were just downright crooks. They really did set back the power industry. But Insull was one of the ablest operators we have ever known. If he hadn't gotten those ideas of grandeur, he might be a revered man in the industry today.

QUESTION: I have forgotten which age in history this goes back to, but you have mentioned at least two tendencies in the power industry. One is the tendency toward public ownership. You say the power industry in your opinion is the first that is apt to be publicly owned by the Government. At the same time you have talked about a tendency toward more comprehensive development of a basin, the integration of all the activities in the basin from the headwaters to the mouth, as a single unit. It seems to me that those two are inconsistent aims unless you go to socialization of agriculture and industry and everything else. Would you clarify that?

MR. SWAREN: I didn't say that I wanted to see that happen. I meant to imply that I feared it would.

I agree with the last phase of your question, that is, how are we going to do it without the socialization of everything? I think that the socialization of the power industry is merely the camel getting its head inside the tent.

I could talk on that for the rest of the afternoon. There are many reasons on both sides. Certain phases can only be done by the Government, because of the many financial reasons involved.

That is working out at Bonneville. You know how well private and public systems are operating there. Both types of ownership are working together.

I would like you to ask that question at our Tuesday afternoon seminar. You will find men there who can give you a much better answer, who are much more able to speak to that point, than I am.

QUESTION: Why was the breakup of Commonwealth and Southern justified when the Government turned right around and built TVA to do the same functions?

MR. SWAREN: You are confusing two things. TVA was not built as the result of the breaking up of Commonwealth and Southern. Tennessee Power and Light Company, which really was the nucleus of the TVA system, probably would have been part of the Commonwealth and Southern structure.

I would rather not get into that argument about TVA. There is a great deal to be said on both sides. There is a great deal to be said about the surrounding territory, the economic advances of neighboring states as compared with Tennessee. Fundamentally, much of the controversy is on an emotional level rather than economic.

If you recall, I said that in the execution or administration of the death sentence clause the SEC went contrary to a well-established principle of financial investment. You have often heard some people

say: "Put all your eggs in one basket and watch the basket." But if you go to a banker, he will advise you to diversify your stocks or your bonds, to diversify your holdings.

That was the principle on which many of the holding companies were formed. The Commonwealth and Southern is a good instance. It had Georgia Power, it had Alabama Power, it had a power company in Michigan, it had a power company in southern Indiana. It had some little companies farther west. In other words, its power holdings were diversified over a large portion of the Nation. The Electric Bond and Share was an even better example. If bad luck or bad economic conditions entered into one area of the country, another area of the country would be able to carry the dividend load because it might be having good economic conditions.

From that point of view I think the administration of the death sentence clause might mave been modified profitably. However, it was administered upon the principle that the power companies held by a holding company must be contiguous properties. And that has worked out well. The power companies apparently have profited by it. From the investor's point of view I am not so sure but what a well-administered holding company with a nation-wide coverage would be better.

QUESTION: I wonder if you would give us the low-down on the bitter squabble between California and Arizona over the Colorado River water rights.

MR. SWAREN: It has been so long since I have been in that area that I do not know that I can give you the low-down very well. There isn't enough water in the Colorado River to meet the requirements of both Arizona and California. California has played better politics and got the upstream states more on its side. It pretty well ganged up on Arizona. Arizona and California both are suffering from lack of water. The Malthusian theory could very well go into effect in that area, by way of water rather than food.

QUESTION: You said the Federal Power Commission has exercised considerable restraint. According to the record, they have also exercised considerable restriction. The president of the Washington Power, Light, and Water Company was from 1930 until recently, absolutely prohibited by the Federal Power Commission from building any power plants in there. A recent article in the Washington Post said the same thing had occurred on the Potomac River, where upstream diversions could be used for power and where the local power people wanted to do it. So the Federal Power Commission has also exercised considerable restriction.

MR. SWAREN: That is right. It has introduced many restrictive regulations. But it has exercised a great deal of restraint in other directions.

Let me tell you a little about that Potomac River project. There is not much power to be derived from the Potomac in the vicinity of Washington. One steam generator could pretty well give as much power as you could get from the Potomac River in this vicinity. It is not a big proposition. Now, for that small amount of power, and this being the National Capital, do we want to destroy the beauty of that river? I don't think so. Full development of all its tributaries, while giving a large installed capacity, would not turn out many kilowatt hours, due to the wide spread of stream flow.

Now, as to why the Federal Power Commission will or will not allow development in Washington, I would rather not argue that case. Part is based on congressional action. But I would like to tell you about two other cases that are before the public right now. One is the Roanoke Rapids case, down in North Carolina; the other is the Kings River case, in California.

The Virginia Electric Power company is anxious to develop the Roanoke River. The Pacific Gas and Electric Company is anxious to develop the Kings River site. In both cases the Interior Department is fighting that development, saying that Congress has said that the Kings River and Roanoke River are to be developed as a unit. Yet the development of both sites by the Interior Department may take from twenty to fifty years, while these power companies are ready to do it now. The Federal Power Commission has granted permission to proceed at both sites. The Interior Department is fighting these projects. These will probably have to go to the Supreme Court to be decided.

In many cases the Federal Power Commission--I don't agree with it on many things--has been very fair and very equitable in its decisions. The Commission has rejected, thrown out, many applications as not having jurisdiction. The New River decision was broad, sweeping, and so covering that a kid can't put in a flutter wheel without a license.

QUESTION: I don't believe you mentioned the fishing industry. That does at times have something to do with electric power, doesn't it?

MR. SWAREN: In the last year I required my power committee to read a book on wildlife management. I want to tell you that the management of the wildlife industry, or the pleasure industry, whatever you want to call it, has certainly been a great headache to the power industry, both water power and steam power, in many cases. However, there are some places where it is really quite serious. One is the salmon spawning areas.

There are so many places where society impresses itself on power. I touched on only a very few of them. I just touched on three or four, when there are literally hundreds of points of contact. The point you bring up is one of great local effect, but not too much national effect.

QUESTION: I would like to ask something that is probably more about law than power. You said quite a bit about riparian rights, but I still don't understand it clearly. Suppose, specifically, that a farmer owned a hundred acres on the Potomac River. Just what would his riparian rights mean to him?

MR. SWAREN: He would have control over to the Virginia shore. The state boundary laws put the entire Potomac River below the low-water mark in the state of Maryland. Most state boundary laws say the dividing line is the center of the river. It would mean that he would have the right to water his stock at that place, along his land. He would have the right to take water out. He could put in a mill there if it didn't interfere with the flow of the stream, if he returned the water before it passed the edges of his tenement. He could keep anyone else from crossing his land to get to the river. There are all sorts of court decisions of that type, and it is in the Maryland law that no one can cross his land to get to the river even though the nonriparian owner might want to water his stock.

QUESTION: Even if they didn't have those decisions, nobody would object to a man putting in a mill or watering his stock, would they?

MR. SWAREN: Oh, yes, they would. You can't do it without permission. If you are a nonriparian owner, you can't cross the land of a riparian owner to do those things. Water and riparian rights are as quarrel provoking as boundary disputes.

QUESTION: Isn't there a lot of confusion regarding these multiple-purpose dams? I understand that in the West, where the flood-control people are participating, they build these dams for multiple purposes--to stop the runoff in floods as well as to conserve water. But don't the two purposes conflict with each other? In other words, if the dam is full of water and a flood comes along, that dam can't hold back any of that flood water. It is already full.

MR. SWAREN: You remember, I mentioned that there are many contradictory features in these various laws. You are quite right. When the power people want to build a dam, they want to run it full of water when there is plenty, so that they can later on draw water out when the water is low. Now, if the dam is full and a flood comes, obviously you can't store any more and it is going to run over. So the flood control and power are diametrically opposed. If you have one, you can't have the other. You have to leave vacant space back of your dam to top off the flood.

The best flood control is by dry dams. The conservation districts are building these dry dams. They are simply obstructions to the flow of water. Over on the Rhone River there are a great many dry dams. These

just obstruct the flood water from running off until the worst of the flood is over. In the Miami Conservation District you will see on every one of these dams a big bronze plate describing how it works. It is never to be used for power purposes.

Incidentally, speaking of stopping flood waters, generally speaking, a dam that is put in for water storage, or a dam that is put in for flood control, will flood as many acres above the dam as it keeps free of flood below the dam. It insures that the same acreage is flooded each year, and not one year flooding at one place and another year at another place. So economically it is desirable. But from a purely physical point of view you save little or no acreage from flooding.

QUESTION: Would you continue your discussion of this tendency toward government ownership of the power industry? You speak of this threat of socialization of the power industry. In one of our seminars, the one of the light metals industry, I think, we learned that water power development is limited and that we will have to develop more and more steam power. Will you discuss that conflict? It seems to me there is inevitably a conflict between the possible socialization of the power industry, this camel's nose that you speak of, and the development of steam power by private industry.

MR. SWAREN: You are touching the point now where the camel is beginning to get his hump in. Originally TVA legislation provided that no steam plants should be built. I am taking that as an excellent example of a well-run organization. It always had quite a number of connections with steam plants and owned a few plants acquired from predecessor companies. During the war the steam plants, mostly owned by private companies, pumped a great many more kilowatt hours of energy into the TVA system than they took out. In other words, TVA was used almost entirely for peaking for these companies during the war.

Now TVA is trying to build steam plants. The Reclamation Service wants the same thing. It has even been carried into the Pacific Northwest, and the private companies have said: "Bonneville Power Administration has taken over the responsibility for the supply of power to this area. Therefore it should supply all power, even if it takes steam power to do it."

This whole problem of Federal power started out merely to develop wasting resources, land as well as water. In many cases it was that kind of development and nothing else. But sooner or later, in order to meet certain requirements of load, Federal bureaus want to go a little bit further and a little bit further. So I feel that it is just a step toward control of the power industry. If you can sell water power, why can't you sell steam power? It is just a matter of detail. If you sell power, why not rent homes? If you rent homes, why not sell groceries?

Incidentally, Lenin and Trotsky and Stalin have all said that the man who controls the power industry of a country controls its economic life. If you ever have had an opportunity to study any of their instructions for revolts, one of the first places that they recommend for sabotage is the power industry. In their various five-year plans you will find that the development of power has always been a main issue. They have done more to develop their power industry than they have their steel industry or their rail industry. It is a fundamental tenet apparently of the Communist Party that the power industry is most important.

QUESTION: I understand that the Passamaquoddy project has been abandoned. Was that because of technical problems or because of the infeasibility to operate it?

MR. SWAREN: It is technically possible, but it would result in a particularly difficult fight with the state of Maine. There are provisions in the state constitution of Maine which say that no water power from the state of Maine shall be transmitted out of the state and that no power from outside the state shall be brought into the state. There are two or three other legal difficulties. But that is one big reason--a fight between the state laws and the Federal Government in order to get a market big enough to take the power from Passamaquoddy.

Technically and scientifically Passamaquoddy is altogether practical, but the development of the works would be tremendously expensive. Then to get the power to market is difficult. I haven't seen any recent figures or made any of my own, but I have analyzed quite a few earlier reports. Even with the high cost of coal in that area, I doubt if Passamaquoddy could compete with a steam plant using coal for fuel. It would be a tremendously expensive project to build.

Your questions indicate a large interest in this question of private or public ownership. Most of this conflict is ideological. Excellent systems are built and operated by both. Initial costs of physical construction and operation are not materially different. But the burdens of capital costs, taxation, and allocations are entirely different. If you feel that the entire Nation should bear the cost of providing power for a limited area, or a favored industry, you will probably favor public ownership. If you feel each project should carry its own burden, its full burden, you will probably favor private ownership.

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