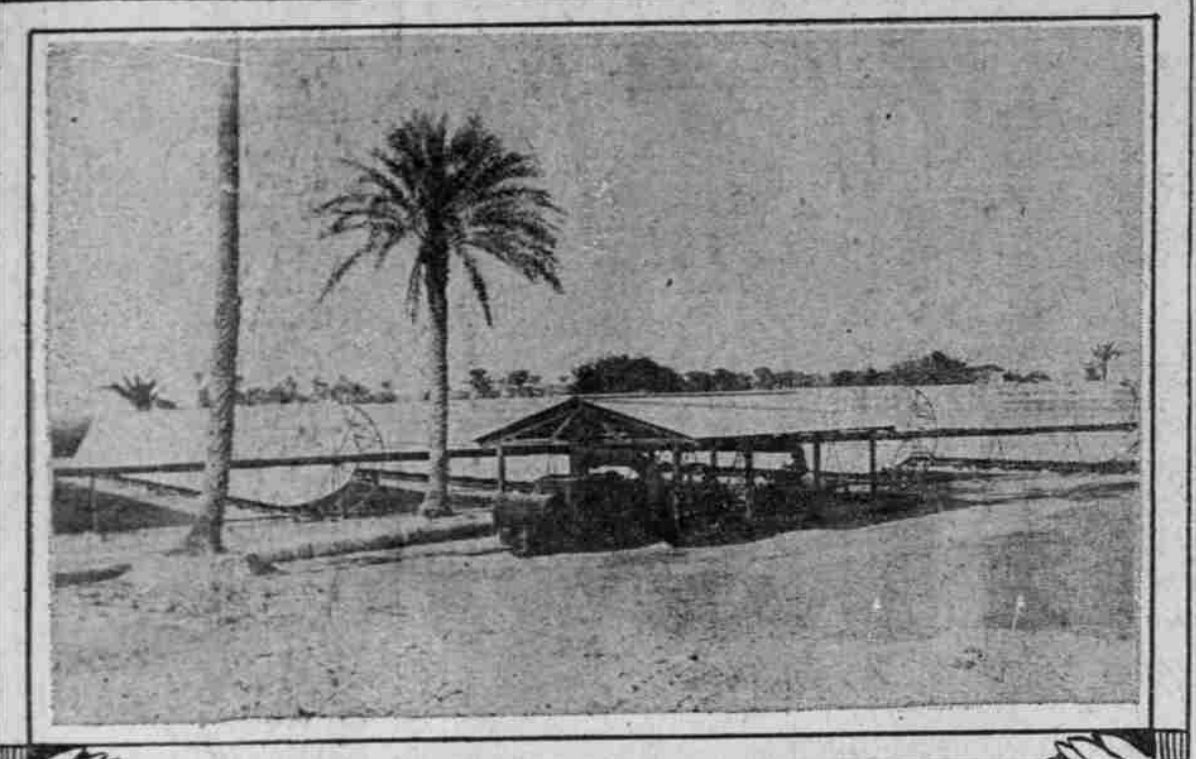


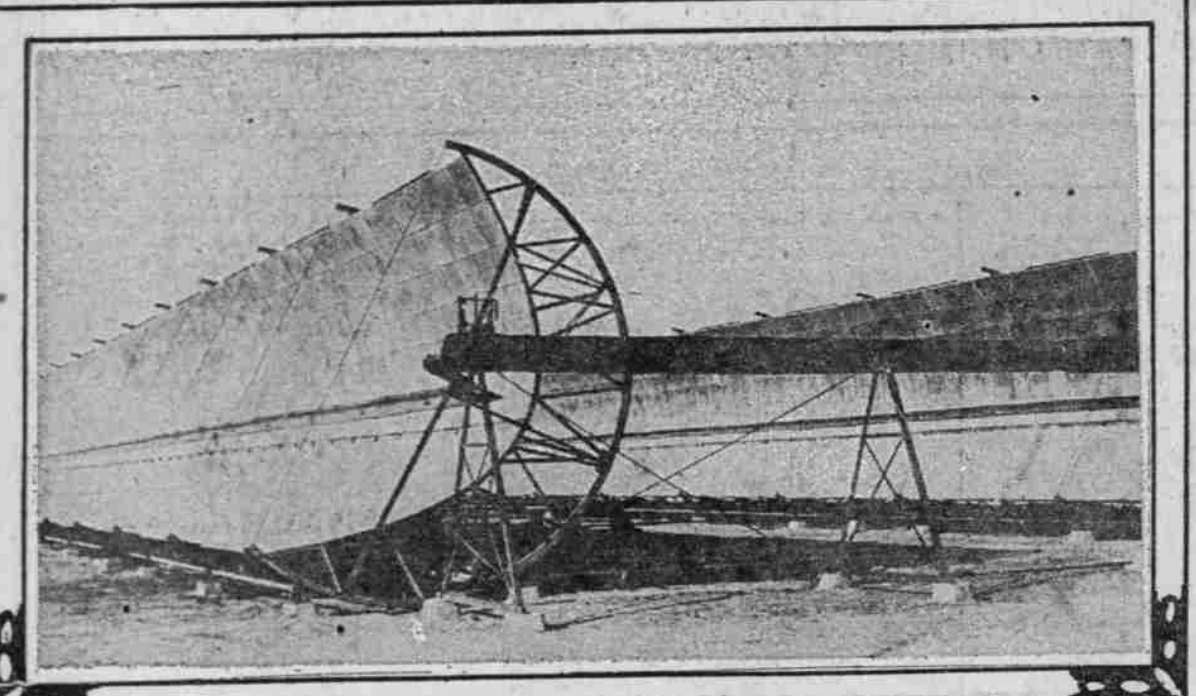
AMERICAN INVENTOR SUCCESSFULLY USES EGYPTIAN SUN TO PRODUCE POWER

Unique Appliance Concentrates Heat Rays Creating Steam Which Can Be Used to Drive Irrigation Pumps.



GILLIAMS SERVICE

Inventor Shuman's Egyptian Sun Power Plant.



GILLIAMS SERVICE

Close-Up Picture Of Sun Heat Absorber In Operation At Cairo, Egypt.

GOOD old Sol faithfully serves us for many purposes and now a bright inventor has found a new means to utilize his rays.

For many years, scientists have known that mechanical power to any desired amount can be obtained from the rays of the sun and have measured this power accurately, but owing to its diffuse nature, its collection for practical purposes has presented many difficulties.

Frank Shuman, an American inventor and scientist about 12 years ago concluded that these difficulties could be overcome and with an organized force, seriously attacked the problem. As there is nothing in the tropics cheaper and more plentiful than sunlight and as there is nothing in the tropics much scarcer or more expensive than coal, Cairo, Egypt, was selected as being the best location for the effort. It has been so successful that Mr. Shuman now has in operation a 50-horsepower plant, capable of pumping 8000 gallons of water a

minute, which derives its power entirely from the heat rays of the sun, concentrating upon boilers in which steam is produced.

Having proved that the commercial use of sun power is possible, Mr. Shuman thinks that his discovery will be of the utmost value to future generations, as after our stores of oil and coal are exhausted, the human race can still receive unlimited power from old Sol, who, it is presumed, will continue to do business as usual.

It is well known that much sun power is lost when it reaches the earth by reflection.

When the rays strike water, most of them are reflected back into space. When they strike the sands of the desert, most of them are reflected away. And even when they strike the green of the forests, great losses by reflection occur. This loss by reflection may be seen by looking at the moon. The sun shines on the moon, the moon reflects most of the light off again, and a portion reaches us as moonlight. But when the sun's rays strike a black surface they are all absorbed

and turned into heat. Were the moon painted black, then we would not be able to see it at all. Were the whole earth painted black, all the rays would be absorbed and turned into heat, and before evening a temperature high enough to melt steel would be reached and all life destroyed.

Working on this principle, Mr. Shuman simply collects the rays of the sun, absorbs them, and thus turns them into heat.

The present Egyptian plant, its inventor claims, fulfills everyone of these requirements.

Boilers Absorb Heat.

Robbed of technical details, the principle on which Mr. Shuman's invention is worked is as follows: The steam is generated in sun heat absorbers, five in number, which each 12 feet wide at the top and 24 feet long—parabolic troughs or mirrors, for catching the sun's rays and throwing them upon the boilers, swung at the focal line. Each mirror is set at such an angle in relation to the sun and the boiler that all of the rays falling

on the mirrors are thrown on the boiler. This boiler, being painted a dull black, absorbs all these rays and turns them into heat, which generates low pressure steam.

The heat absorbers are placed about 25 feet apart, so that they will not shade each other when the sun is low in the morning and afternoon. Their axis points north and south as does that of the earth, and they turn from east to west on their axis to face the sun. The mirrors are set in a light steel framework, each one at the proper angle to throw the light upon the boiler. They consist of ordinary sheets of third-quality thin window glass silvered on the back, the silvering being protected by the proper means from the atmosphere.

At the focal line of all the light rays, there hangs in the present plant a cast iron boiler, which is tubular at the top and flat at the bottom, where the water space is. This boiler is 15 inches high and hung on light rods in such a manner that the expansion and contraction will not interfere with it. These heat absorbers are set on crescents, which roll in a system of small racks and pinions for turning the sun heat absorbers from a low eastern aspect in the morning to a low western aspect in the evening.

Hot Water Stored in Tanks. Naturally, when night comes or a dark rainy day happens along, the source of power is cut off. To overcome this difficulty, Mr. Shuman has to store in huge tanks, properly insulated, like thermos bottles, from the atmosphere, large quantities of water to the boiling point and from this boiling water he can draw during the night or during a rainy period, low pressure steam with which to keep his plant in operation. Thus a very protracted bad spell of weather is needed to seriously interfere with continued running.

As yet, sun power in our latitudes is not a practical thing, Mr. Shuman acknowledges, although it is not because the sun is not powerful enough, but because the percentage of hours of sunshine throughout the year is too low. Sun power must therefore, until the matter of storage has been more fully developed, which Mr. Shuman thinks quite possible, search for its location in those tropical countries where there is 50 per cent of sunlight over, and about 20 per cent of the total cultivable area of the earth lies, says the inventor, in tropical regions in which sun power can now be used.

"Sun power plants, of course, disperse with all fuel," remarked Mr. Shuman the other day, "to be practical and commercially profitable they must conform to certain requirements. They must not, for instance, cost so much to construct that the interest on the cost over and above that of a coal-burning plant of equal capacity will amount to too much of the profit made by the saving of cost of the fuel. They must be constructed of such material and in such manner that few repairs are needed, and so that they will last many years. They must be constructed strong enough to stand the heaviest gales that may occur in the localities where they are erected. And they must be sufficiently simple, so that any one capable of running an ordinary coal-burning plant can operate them."

The present Egyptian plant," Mr. Shuman added, "fulfills every one of these requirements. Sunlight can be concentrated by lenses, but this would cost too much for power purposes. The concentration of sunlight by means of funnel-shaped reflectors also presents practical difficulties which make this method too costly."

Asked what would be the effect of dust settling on the mirrors and on the glass, Mr. Shuman said that it would mean loss of power, according to the thickness of the dust. But labor is cheap in the tropics, he added, and 20 pence a day had been found sufficient to keep the mirrors entirely clean, the proper washing arrangements being provided.

But for the war Mr. Shuman believes sun power would now be extensively employed for commercial purposes.

"Just before the beginning of the war," said the inventor, "we had concluded arrangements with the English government and the German government to take up the sun power proposition in the tropics, and both sent engineers to test our plant in operation. The German engineer, Dr. Reichenberg, held a special session to hear what I had to say about sun power. After my lecture in the Reichstag committee agreed to advance 200,000 marks for a plant in German East Africa. The sun power proposition was also taken up largely in Chile, but the war began and everything of this kind has been laid on the shelf. "We have proved the commercial profit of sun power in the tropics, and have more particularly proved that after our stores of oil and coal are exhausted, the human race can receive unlimited power from the rays of the sun. I have been told that I am the only inventor who has ever been asked to explain his invention at a special session of the parliament of any great nation."

UNPARALLELED PROSPERITY FOR AMERICA IS IN REACH, SAYS FRANK A. VANDERLIP

Intelligent, Able and Honest Government, According to Capitalist, After Obtaining an Understanding With Labor, Could Realize Opportunity.

VANDERLIP CITES OPPORTUNITY.

America has before it an opportunity for a period of unparalleled prosperity.

The great war left it with few scars. Its natural resources are greater than those of any other country in the world. It has the greatest facilities for production. It has the most favorable opportunity for bringing about a sound and permanent adjustment of the conflicting issues between capital and labor.

But to realize on this America must have intelligent, able and honest government. The countries that make the greatest and quickest progress, Mr. Vanderlip notes, are those whose government is the most responsible and which has the keenest grasp on the problems that face it.

BY FRANK A. VANDERLIP.

America's Foremost Banker and International Financier.

WHAT HAPPENED TO EUROPE?

XI.

America's Opportunity.

SOMETHING of what the great war has meant to Europe is what I have been trying to describe in the preceding chapters. We all look at even great events in the light of our own personalities, and what America is most keenly interested in undoubtedly is what the great war has meant to America.

There are some points in respect to America's relative position in the world that can be defined with a fair degree of assurance, however. The advantages of America's unique position, combining the resources of the greatest world capitalist with the resources of the nation richest of all others in raw materials, give promise of a material prosperity unparalleled.

America is almost self-contained as to raw materials. We must import rubber, but all other rubber manufacturing centers must do the same. We import some ores that, mixed with our own inexhaustible supplies, produce a higher quality of product. Among foods, the coffee bean, tea and chocolate are perhaps the only serious demands we must make on other lands. Of course, we must have imports if the world is to pay for what we export, and we can consume large values of foreign fruits, tea, chocolate, nuts, vegetable oils and the luxuries of silk, precious gems and platinum in which to set them. But these are not fundamental necessities to our industrial life.

Agricultural Capacity Large.

Then we may add to these advantages a background of almost limitless agricultural capacity. We have great yields with the least expenditure of human labor found anywhere in the world, while the products of those fields are moved at the lowest transportation cost of any land transportation in existence. There are other nations that move tonnage on inland waterways more cheaply than we do, but if we compare the amount of human labor expended in other fields with the amount expended in ours, the difference is startling. For the whole of England, for example, a recent census shows that the average number of agricultural employees per 100 acres is 46, while in 1910, the average number of our improved agricultural lands consumed the labor of but 12,559,293 agricultural workers in the United States, an average of 2.54 per 100 acres.

Then let us remember that there has been comparatively little direct disorganization of our whole machinery of life by the catastrophe of the great war, while in Europe there has been not only immeasurable direct destruction from the war but what will prove far more harmful than all that, there has been disorganization of the delicate interrelations and reactions in the whole international industrial machine which it will take, at best, a generation to correct.

In the all important relationship between capital and labor, we start with comparative advantages, too. Labor with us has been far better paid and has fewer just grievances than has labor in any other industrial nation. Still we have our share in the world problem of bringing about true co-operation between capital and labor. Those nations which make the greatest progress in that field will have an ultimate advantage over those nations

which keep up an internal warfare that fosters discontent, resulting in great masses of population feeling that they are living under conditions of bitter injustice. This is true, no matter what other advantages the discontented people may have.

Economic Law Is Discussed.

I have come to believe that half the woes of the world are directly attributable to an ignorance of economic law and to a blindness to social injustices. In the end, the prosperity of a people always bears a true relation to their capacity for production. If the capacity for production be interfered with, as it always must be, when workmen are discontented, because they feel that they unfairly share in the profits of industry and because of the economic fallacies to which they cling that result in a conscious limitation of production, then the limits of national prosperity are sharply bounded, no matter what the richness of natural resources may be. Therefore I believe that the measure of our future prosperity in America is definitely related to the wisdom with which we work out the relationship between capital and labor. That relationship will never be wisely worked out in an atmosphere of economic ignorance. Our failure to understand the purpose and significance of some of the great underlying principles of economics is general. There is quite as much of that ignorance in the managing offices as there is in the factories.

Elsewhere I have tried to give some exposition of what seems to me the greatest problem of the age as it is presented in Europe, the problem of the relationship of capital and labor. I believe the stability of the present order of society, the maintenance of a society based upon the principle of property rights, is bound up with the way this problem is worked out in Europe. We cannot stand a world apart in its solution. Indeed, we cannot stand a world apart in any sense. No matter how self-sufficient we may believe ourselves to be, no matter how limited within us, we are inevitably part of the world, a world in which ideas travel with a freedom and rapidly that must force us to become internationalists in our views, and must govern us by international considerations, whatever may be our natural tendencies to Chauvinism or our disposition toward an insular isolation and security.

A farmer in a Kansas cornfield may fall to see what concern it is of his if there is unrest in the Balkans, but the shrewd farmer at Warsaw, a growing army of adherents to syndicalism or guild socialism in England, or a financial crisis in France. Inevitably, however, the farmer in the center of America will directly feel the effects of all the ebullitions of life on this other continent. He is today nearer to the things that may happen in Paris in Belgium or in London than were the peasant farmers in those very countries to their own capitals in times gone by. Let no American feel that he can escape all relationship to post-war developments in Europe. That is impossible, and being impossible, we should at least aim to understand those developments sufficiently to recognize something of their significance to us. The future of Europe is going to be largely shaped by the wisdom or the lack of wisdom that we in America show in our grasp of European affairs, in the way we seize our world opportunities and in the sincerity with which we discharge our world obligations and render service where service is due. If of nations provincial, selfish, all those qualities will react on our own future. If we are wise, broad and generous

with our help, our recompense will be beyond measure.

And now in conclusion I want to say one solemn word in regard to the supreme lesson which I have drawn from my observation of the present situation in Europe and that is a lesson to which I have not in this book heretofore referred. It is the duty that lies on each of us to give our country good government. I did not know before that I had in me a power of such poignant sympathy with dumb and uncomprehending peoples as this opportunity for observation has awakened. One hears the demagogue rant about his love for the people and property rates those sentiments. No one with seeing eyes and a sympathetic heart could make a wide observation of present European conditions, however, without being moved to his depths in pity of peoples who are suffering because they have been badly governed.

Wherever there has been moderately good government, there has quickly followed, astounding progress. The inherent capacity of people under modern conditions to improve their surroundings, given the boon of honest, wise and just government, is marvelous; but whatever a government lacks in honesty, wisdom and judgment this is very quickly reflected in a plight that seemingly no amount of fine individual characteristics can overcome. Much of the lack of good government comes solely from ignorance.

No matter in what direction we look, we find some men in governmental positions who seem more moved by personal ambition than by an unselfish desire wisely to serve. No matter what desperate national circumstances may exist, we see that great national needs fall sometimes to bring out from national leaders the unselfish service that their people should have.

I have said that it appears that half the woes of the world were occasioned by economic ignorance, and it seems as if most of the other half could be traced to selfish political ambition. And so this is the lesson that has dominated all that I have learned. It is that crime of all crimes, most far-reaching in its effect, the crime which involves harm to more innocent people than any other in the whole category of human frailty is the crime of abusing the privilege to serve. A thief may injure him from whom he steals. A murderer cuts short a single life. Those crimes are as nothing compared to the uncomprehended crime which a public official commits in permitting personal ambition or ignorance to blind him to public duties.

And so it all goes back to a sound citizenship, to a comprehension by all of us of our individual responsibility for good government, to the active acceptance of individual responsibility by every man who lays any claim to the rank of good citizenship.

(END.)

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Umbrellas Used in Egypt's Religious Rites.

Contrivances, Still Handy in Twentieth Century, Found Sculptured in the Ruins of Nineveh.

UMBRELLAS are by no means a modern contrivance. They are found sculptured on the monuments of Egypt and in the ruins of Nineveh and their use in China and India is very ancient. In Greece they had a part in certain religious ceremonies and there is no doubt from the paintings on ancient Greek vases that umbrellas very much like those in use at the present day, were known centuries before the Christian era. They were also used among the Romans, but only by women.

The umbrella also seems to have been a part of the insignia of royalty, as is still the case in many parts of Asia and Africa. An English dictionary published in 1708 defines an umbrella as a "screen commonly used by women to keep off the rain."

Umbrellas were introduced in America in the early part of the 18th century, but their use at first was confined exclusively to women, as it was considered effeminate to carry one.

Jonas Hanaway is said to be the first man who walked the streets of London with an open umbrella over his head to keep off the rain. He is said to have used it for 30 years before they came into general use for this purpose.

UNCLE SAM HAS CENTER OF STAGE IN DARLING CARTOONS

