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Wanted, a Test for "Man Power"

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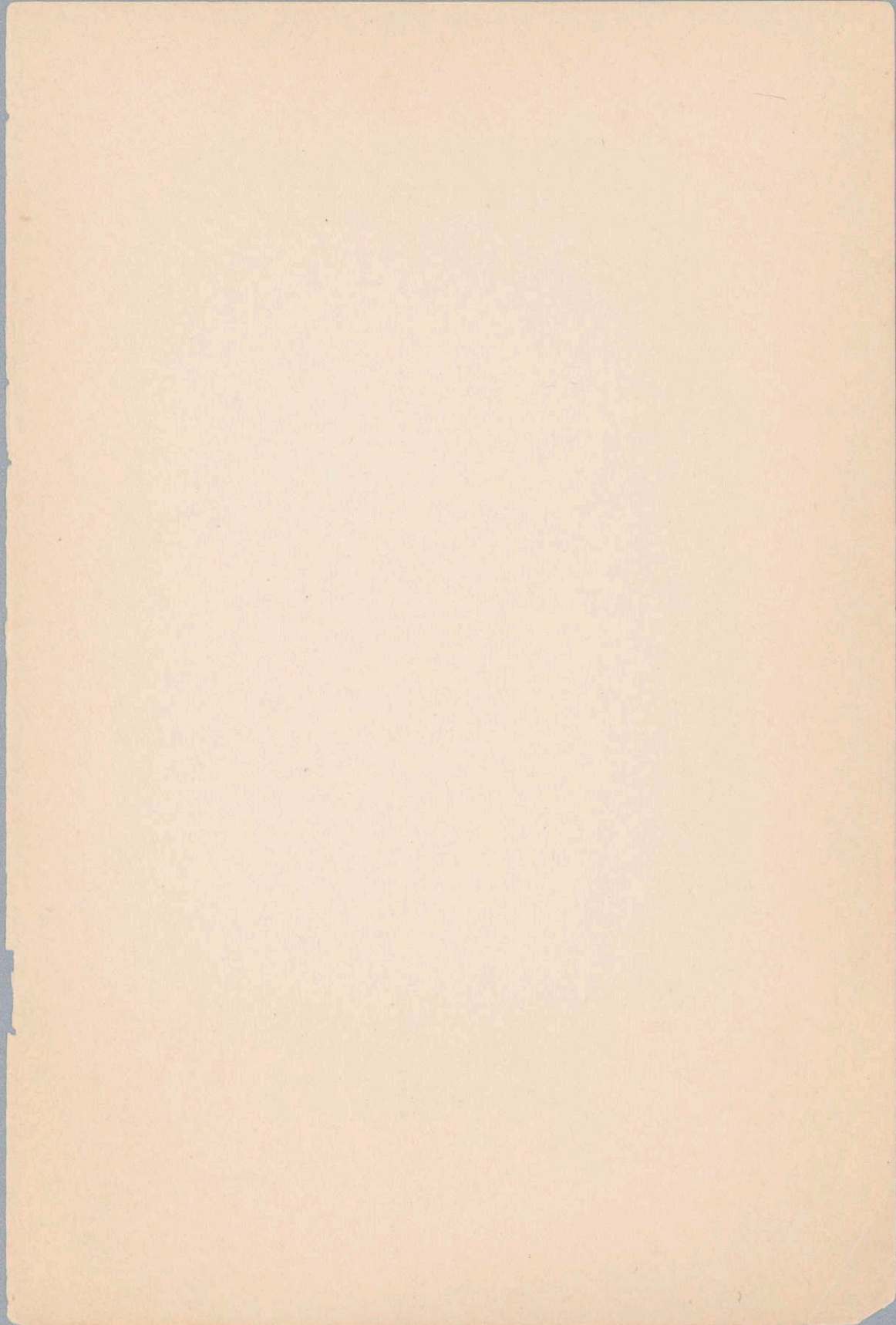
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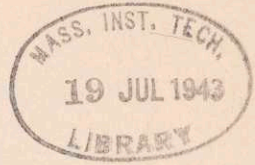
By
ELLEN HENRIETTA RICHARDS

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WANTED, A TEST FOR "MAN POWER."*

BY ELLEN HENRIETTA RICHARDS, A.M., S.B.**

Students and Friends of Students:

Because the graduating class of today has not finished its studies, it has only begun its life work. And today the student in practical life needs friends more perhaps than at any other time. The force which has accomplished work in the world, has always been man power. In the early ages of the world it was literally the raising of weights and carrying of burdens. Yet the terms in which we express our standards are not man power but horse power and foot pounds.

In the course of the ages man has invented machinery to do the lifting and carrying for him—but this inventive ability is force just as truly. Progress in mechanical work has been greatly aided by the adoption of standards to which an effective machine must conform. The mental output of man would, I believe, be greatly increased by the adoption of standards of human accomplishment in these newer lines of work.

There is a theory that the great monuments of the world were built by the making of a long incline, and the carrying of heavy stones up the incline very largely by man power. Today the peons of Mexico are doing a great deal of work, cheaper than can be done by mechanical power. It was a very great revelation to me to find that the great drainage canal was excavated in that way—that it was cheaper to have the peons carry the dirt up from the steep banks of the canal than to instal excavators. That was largely on account of the cost of fuel and transportation. I believe today it is cheaper in the mines of Mexico very largely to have these same peons carry the ore sacks up what they call their chicken ladders than it is to instal hoisting machinery.

Think for a moment why it is that that sort of man power is cheaper. Such people live on about three cents a day. And I fancy that a great deal of the labor of the world in the past centuries has been as cheap as that. It is the cheapest kind of labor. The work that they do is not very exhaustive. Their three cents a day does not give them a great deal of extra force. Our Italian and Bohemian and foreign laborers who come here live at the rate of perhaps ten or twelve cents a day, and they do a little more work. Our average American workman wants at least twenty-five cents a day for his raw food material, and he does much more work.

Thus you see that man power, after all, depends a great deal upon the food he eats. If you think a moment you will see why. We hear a great deal today about automobiles, for instance. Did you ever think that you, individually—that every human being—was a self contained motor? We do not have pumping stations where we can

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go and get charged up for a day's work. We are obliged to manufacture all the energy we have to use; not only what we need to keep ourselves warm and to keep the heart pumping, but any energy which we need to use in other ways we have to manufacture. That is to say from the food we eat, and the exercise we take, and the general good condition we are in, we manufacture this power, this man power, this force—whatever it is—that we have to spend.

It has been estimated by people who have worked along these lines that a man, who has a very good digestion, a very good circulation and lung capacity, is able to do about a fifth as much as a horse; that is, he can carry about a fifth as much weight, or he can lift a load perhaps about a fifth. If you roughly calculate it, a man (using the term in a generic sense) weighing about 150 pounds can carry this weight up 10,000 feet. It is a very good standard of a day's work.

I don't mean we can do it the first time without practice. But that is an ideal—to be able any day to have that feeling of power that we can climb 10,000 feet or carry 100 pounds six miles. The latter is perhaps a little easier, and it is certainly a little more practicable as a test of man force.

We have had in engineering the word "duty" for the efficiency of the machine. This word has gone out of use now, and, curiously enough, along with it, it seems to me, has gone the very idea of duty anywhere. I am afraid we do not feel very strongly our duty to the world or to ourselves today, and yet the idea of efficiency is just as strong in the world as it ever was. We have turned, as you in this region very well know, from the actual pulling of the horse and the lifting of the machine to electricity.

Now, if we think one moment, electricity gives a much better comparison with the force which we wish to develop in ourselves, whether our own human power proves to be electricity or not. The ideas and terms used come very much nearer to our conception of our own work. We do not visibly see the source of the force as we do in the horse pulling a load, but we know the force is there because of the power evident in results. We use the term efficiency for the result of electric current, and we are transferring that term very generally to human achievement. This efficiency of the human being is analogous in another way to what we know of an electric current. One of the chief elements in the use and control of the electric current, is as you know, resistance. And certainly the graduates who have studied electric cooking know that this resistance brings electric force down into heat. We say it fritters away the energy into heat; that is, the heat is a lower level of energy than the force which we use in the current.

The human body should be a very good electric motor, because we have nerves, these little threads which carry our will, which give us the impulse to the motion. We have the most perfect mechanism in its way, of ropes and pulleys and lubricated joints, that is known. The ordinary machine, as you know—the steam engine, uses only about ten per cent of the liberated energy. When we transfer it into electricity I think we are able frequently to utilize ninety per cent.

Our human bodies ought to utilize a very high per cent. of the energy they make. If you do not carry a hundred pounds six miles, or if you do not climb up a mountain, you need a certain amount of energy for other work, thinking, planning, inventing. I wonder how

many of us here have very much spare energy—how much we could really do. If we do not have it, and are not able to accomplish what we set out to do, things are wrong. There is some friction, some resistance reducing the power, or there is some lack of connection. In order to get the full force of electric current we must have all things working together. We must have a good contact between the places whence the force comes and the things we wish to accomplish.

As students in school, we fritter away a great deal of energy into just mere heat work—into friction. We do not accomplish nearly that which we might in school if all the connections between the things we are studying and the results we wanted to get were made. One whole lesson for life, for the work which we are to do afterwards, is to secure this good connection as readily and as quickly as we can.

Therefore, it is, as you will readily understand, that we are making today, more than ever before, a great study of what is the best environment for the production of this human power. For one thing, it is good digestion. The food must not only be eaten, but it must be assimilated. There must be good circulation, because the food must be carried to every tiny cell. I can remember when we supposed almost all the work of aeration, of oxidation was done in the lungs. Today we know it is in the tiny little cells everywhere that force is liberated. That means that the circulation is of very great importance.

Then we must have good and refreshing sleep, because this energy which is made in the body must have some space of time to accumulate. Those of you who have studied electricity know that there must be an accumulation of energy before we can get a pressure of energy to use.

We must have one other thing which is very much overlooked in this production of man power, and that is good lung capacity. It seems a great pity that students are not taught from the very earliest moment to use the lungs to the full capacity, because we must have the oxygen to burn up the food which we take in order to give us this energy. There is no other way to get it. That is the way which is ordered, and there is no other. Therefore, one of the very first things which is essential for the production of this force is good lung capacity—good breathing power. One should stand right and keep one's shoulders right, and keep such a position as to get the full capacity of the lungs, and we should have the fresh air habit. The school neglects that side of student life. It sometimes seems as if the old academic idea was—here was an individual, and all you had to do was to pour into him a certain amount of knowledge. It didn't matter whether he was in good physical condition or not. In fact, in early days the school and college attempted to educate students weakened with disease, often with a disease so far advanced that they failed very soon after graduation. It was once supposed a student might go to school, and board himself, and live somehow, and starve himself, only if he got a certain amount of knowledge he was fitted for the world.

Today the demands of the world are such that this is not quite true. The engineer who goes into the field, the teacher who goes into college work, the housewife who goes into her own home work, all need a good healthy foundation. They need to have all the nerves in good condition, because of the more exacting circumstances under which we live. It is absolutely necessary today, I believe, to have a

sound body to manufacture and to conduct the electrical, or whatever force there may be within us, to the very best advantage. That is why we are preaching so strongly the doctrine of health, of sanitation, of the education in all these things which are given in the various courses of home economics.

This physical efficiency as a basis for mental efficiency is, we believe, the fundamental point of the human production of the force which surely moves the world. And if you stop to think, it is the most valuable force we have. What is a horse worth? \$200 perhaps, a good horse that can do the work. What is a man worth? Two thousand, at least. And a good teacher is worth \$20,000, if you take the salary expressed as interest. A good engineer is worth \$200,000 actual capital. And yet think how much care we put on our \$50 pigs or our \$200 horse, and what we put on our \$200,000 engineers.

There is a great error in the common conception of what force is worth in the world. Why is this human force so valuable? Because today it is the direction of affairs which we expect the human power to take. That is, it can assemble and collate and collect forces and get results. It is the man or the woman who sees the end clearly, who sees what we can do, who sees how this thing can be made better, how the whole thing can go together for human progress. I believe we are feeling very strongly in many quarters our responsibility today, because each person counts for so much more. The peon digging in the canal has just himself, he lives on three cents a day, and he does just a little bit of work at the superintendent's direction. Now, we who work the forces, who have the powers, want fifty cents a day for food, and we are worth it too, because we are working a great deal more in force and power than has been possible before today.

I do not know whether you remember that definition of Huxley of the educated man, which is so very, very good I think. He says: "That man, I think, has had a liberal education, who has been so trained in youth that his body is the ready servant of his will, and does with ease and pleasure all the work that, as a mechanism, it is capable of; whose intellect is a clear, cold, logic engine, with all its parts of equal strength and in smooth working order; ready like a steam engine to be turned to any kind of work, and spin the gossamers as well as forge the anchors of the mind; whose mind is stored with a knowledge of the great and fundamental truth of nature and of the laws of her operations; one who, no stunted ascetic, is full of life and fire, but whose passions are trained to come to heel by a vigorous will, the servant of a tender conscience; who has learned to love all beauty, whether of nature or of art, to hate all vileness, and to respect others as himself."

I think there is no better definition of a man today than that.

The difficulty has been a lack of personal responsibility for personal power. When as students we have perhaps been reprovved for not doing more, we say, "Oh, well. I was born so." I am afraid many of us have made reply many times when we were criticised for not doing well, "Well, my father never could do that, and my grandfather never could do that." It is an excuse. When I see an acrobatic performer, a very wonderful actor, or any human being who has trained himself to please the public, I always think what an error it is in our schools and colleges that there is not a daily insistence on the fact that a human being can make anything of himself if he is will-

ing to work for it; if he is willing to work for it sufficiently he can accomplish almost anything.

There are very, very few things—there are very, very few cases, where you can lay the blame back on your grandfather. It is because of a lack of will to do.

What we need is a something which will teach us to nourish the will. It is entirely apart from my topic, and I will only say that I think a great deal of our education fails in that line. We have been for the last few years saying a student had better do just as he likes. Those students are going to make for power in the world who can work against resistance, who do a thing because it has to be done. I said a little while ago that this idea of duty which we used to put on the steam engine has gone not only out of mechanical terms, but out of our lives. I repeat, we are a little lacking today, it seems to me, in our idea of duty. That is an ethical side which we cannot take up in this purely material view.

How are we to know whether we have the amount of spare energy that we ought to have? The body can make a certain amount of energy. As a rough estimate I have stated the excess of energy as one-third of the total that the body can make. The heart has to pump the blood, and the body has to be kept warm, and a great deal of energy has to be used up. But I think we ought to save one-third of that total energy to use as we will. Now how shall we know whether we have any energy to spare? There is probably no greater waste in America than in the line of work of these young graduates just going out this month into the world, wasting their energy because they do not know how to conserve it, how to accumulate it and keep it under their control, because in a great many cases their habits during college life have not given them a habit of saving energy. Remember human energy is the most precious thing we have.

In the old New England days sometimes our people used to answer when asked how they were, "Oh, so as to be about." A great many of us today, although perhaps we don't acknowledge it, think we are all right if we are able to be about—if we are able to come to class and do the ordinary material things—"Oh, I am very well." We ought to have within us a sense of spare energy, a force of abounding vitality. We ought to wake up in the morning and be glad there is a new day coming. We ought to feel the force and energy ready for work. That is the first test I think we should apply to ourselves. (I don't know of any outside mechanical test.) We ought to feel glad that we have a day's work to do. I should be very much afraid to ask this audience to rise—those who do feel that every morning.

We ought to feel the ability to do. Perhaps that is the best way to put it. Often a person does not really feel competent, but he makes a bluff of feeling competent. The student comes up to examination on a bluff sometimes. He does not really feel competent. I am very suspicious of a student who says he sat up till one o'clock studying. He is putting up a bluff. He does not feel conscious of his ability to go to that examination.

When you go out into the world that sort of thing will be found out very quickly. The world is a very severe task master. A person finds his level very quickly, no matter what it is that one is trying to do. We have inefficiency in a great many cases and in all lines it is a growing evil. Now, say what we will, an examination is, I think, a

very good test, because it shows you have your power in hand. I know there is a great objection made to examinations. But even if you think you know your subject well, it may be doubtful in the teacher's mind whether you can use it in an emergency, which is what an examination tests. Of course, I mean a good examination. We need some test which we can apply to ourselves.

It has always seemed to me that the great educational value in the schools of manual training was that you did not need the teacher to tell you whether you were right. If you are trying to make two pieces of wood fit together, and you hold them up and see the light between, you know you haven't done it, and you don't need your teacher to tell you it isn't right. In ordinary school work you have a feeling of dependence on somebody else, whereas in the manual training idea you depend upon what you see yourselves. We should find in ourselves a test of our ability to do. I do not know what form it is going to take. I have not a new word to give you, except the word we use in electricity—efficiency.

Whatever we do, each one of us must have a certain ideal for our own force for magnetic power. I believe that is what we must aim for, a certain reserve power. How are we going to get it? Where is it going to be made? It must be developed in the young person. It must come from the home and the home training. That is the place where we must begin. The habit of allowing children to grow up in any kind of way, eating just what they like, and playing if they like, and studying if they like, may seem very nice to the children, but it does not give them the right sort of habits. I think that our efficiency is coming very largely from the habit of life, and that must be formed in the home. That is why we are laying great stress today on teaching home economics—because we believe that sanitation, that healthful position, that these habits of breathing that I speak of, that all the regulation of food, and the habits of eating food, and of sleeping (sleeping is a habit, very largely, that is, a good, sound, dreamless sleep) all come into play in developing this material machine of ours. This material machine is manufactured in our homes, and it is there that the knowledge of these things must penetrate. Love is all right, but it is not today enough to keep a house, as many a woman can testify who has lost her children.

We believe that it is to the homes of the land that we must bring all the sciences we can muster, and we want the young men who are going out today to bring their inventive power to bear on improvement in daily life. Many an invention has been made for the home which has not been used for the home. The people weren't ready. The women threw the inventions on the dump heap, and the men got tired of making them for us. But the time has come young men, when we will take almost anything you will give us in the way of help. And also these students who are going out from the course in home economics are willing to carry that idea still farther. That is why I rejoice in your co-operation. And I count on that mutual help as being a model for many other schools, because it is in this line that we need the very best that we can possibly have. It is the better living conditions which render possible the truer production of human energy. And the most valuable form of it is what we turn

out from our schools—the creating, the organizing ability, that which combines and controls all other forces.

Where the first model homes are going to be for turning out these leaders I do not know, but I hope that each and every one here will add something; and perhaps the initiative will be taken by some of these students who are going out today from us—and that in a year or two we may find the ideal which we are seeking. As I said at first, the students need friends today more than ever before. We need friends along this line to encourage and to support the experiments which must precede the perfected invention.

I am sorry to say that we have pushed our work in home economics against the greatest resistance on the part of the public. The ordinary housewife thought she knew, and she did not like to have us upstarts tell her she did not know, and we have to work under great difficulties. The scientific man thought we didn't know how to apply science, and that we wouldn't apply it if he told us. And so on. It has been under great difficulty, but I believe the time has come when we shall see a very rapid advance. And I hope that you will all go away realizing that the future of America does not lie in railroads or machines, but that the future of our republic is to be determined by the character of the American homes.

