posits and made a careful investigation of their value. These deposits of valuable mineral are in a readily accessible valley, only a few kilometers from Pharsalus Station. All the hills of the neighborhood belong to the lime formation; the area where the lithographic stone is found is reported as about 2,000 hectares. The deposits are under strata of ordinary limestone, but outcrop at some points. Even now, it is estimated that

more than one million cubic meters of this stone can be found there easily, and the thickness of the deposit is at least six meters, judging from a shaft sunk there.

The stone is found in slabs of natural cleavage, having a thickness of from 13 to 33 millimeters, which indeed is not very much; but occasionally the thickness attains 5 centimeters and over. On the other hand,

the plates present very large surfaces without any cracks, and they could therefore be extracted in large pieces which could be doubled in the usual way; quite frequently plates are found which exceed one square meter without a single crack. This will not be large enough for the giant posters which are often printed in one piece, but it corresponds to the thickness of these Greek stones.—Cosmos.

THE HOOK-WORM OF INDUSTRY.

THE TWO TYPES OF ORGANIZATION.

BY HARRINGTON EMERSON.

THE poor white trash of the Southern States and the listless negroes have long been a by-word, but we suddenly find out that all these people, white and dark, are afflicted with a parasite, the hook-worm, which saps their vitality, internally slowly bleeds their strength away.

The remedy is not schools, nor churches, nor the suppression of the saloon, nor the sternness of the task master—all excellent devices; the remedy is the elimination of the parasite. After this initial betterment, the principles of education, of religion, of temperance, of stimulus, may be confidently applied.

American organization for operation, whether governmental (army, navy, civil), whether state or municipal, whether for land-railroads or ocean-steamboats, whether educational or religious, whether industrial or commercial, proves on investigation to be inefficient, often disgracefully so, the efficiency of the output of men of militia age of the country as a whole being not more than 5 per cent, the efficiency of use of materials being not more than 60 per cent., the efficiency of equipment, facilities, averaging not 30 per cent. These inefficiency statements can be verified from the facts, by any competent expert, as readily as an assayer can duplicate the assay of an ore sample.

Our material resources are unsurpassed, our workers are intelligent, ambitious, versatile, our equipment, from farm lands to office buildings, from typewriters up to Mallet compounds and down again to telephones, is lavish; yet it is all depreciated by an equally stupendous inefficiency. The principles of efficiency are simple, are plain, are elementary; they have been accepted and practiced empirically for a few million years since life began on our planet; yet in modern America, we flounder in our productive operations, as hopelessly put back in the running as the hook-worm victim in the South.

What is this insidious disease that wastes our resources of materials, of human potentiality, of equipment—that prevents the application of efficiency principles even as the existence of the hook-worm prevents the application of principles of human well-being?

The industrial hook-work disease is defective organization.

An air compressor, forcing hot and squealing air, and a vacuum pump softly coaxing cooling air, are one and the same machine working on the same cycle in opposite directions. With a very few simple changes the compressor can be changed into the vacuum pump. So with a very few small changes a disastrous form of organization can be turned into a beneficent form.

In primitive times, with that fatuity and perversity which unaccountably characterizes so much that is human, we turn to the left when we ought to have turned to the right. Having two forms of organization to choose from—only two, the destructively offensive and the constructively defensive—we choose for our industrial organization the destructively offensive type, and

it does not work out, never can and never will; while we ought to have chosen the constructively defensive type of organization, alone suited to productive up-building.

The two types of organization are as old as life, are therefore far older than humanity, and we have had to accept them as part of our inheritance just as we accept the necessity of assimilation, of elimination, of reproduction, of breathing. But there is no more reason in adhering industrially to the destructive type of organization, since we have learned that the other is better, than there is in adhering to pack teams and ox carts after the railroad and automobile have been perfected.

To bring out clearly the radical differences between the two types of organization, in spirit, in effectiveness, and in methods, we select two primitive examples, one a plant and the other an animal. The plant trusts to the generous, often enthusiastic co-operation of forces outside of itself and it therefore draws strength of wide and unlimited range. The mammal trusts to the occasional, often grudging, co-operation of powers identical in kind with its own, therefore of limited scope. The pathfinder through primeval forest is impressed with the luxuriant wealth and profusion of plant life—trees, at their best, 400 feet high; is impressed with the comparative paucity pettiness, transitoriness of animal life, whose largest jungle representative is the elephant, twelve feet high and living at most a few hundred years. Plants trust all nature and draw help from everywhere; animals trust none but their kind and grow through destruction. Even that type of all that is silly and innocent, the sheep, will destroy in a few years a millennial pasture range.

The wild rose bush exemplifies the defensive, up-building type, of organization. The rose stems are covered with sharp thorns so that the delicate flowers may not be plucked and destroyed by wanton creatures who might just as well be browsing on grass or leaves, but the color and perfume of the blossoms attract the bees, beetles, butterflies, and moths who in return for an efficiency reward, the honey, cross-fertilize the plants. The petals fade and drop, the seed receptacle, an inconspicuous green, swells and grows. When ripe, the leaves that hid it fall away; it appears red, a tempting rose-apple to bird that plucks it, to mammal that finds it dropped, but the cradle of the seeds is so protected that the rose babies escape to grow and flourish where they fall. The rose relies on defensive up-building organization, calling on water, air, warmth and light, earth, insects, birds and mammals, each taking a part, all helping the rose to dot the western prairies, to deck the roadside and moors of the New England seaboard, to blanket the lovely North Pacific Coast.

Roosevelt gives us the other picture when he describes the African baboons who are organized for offense, for destruction:

"The baboons were very numerous around this camp, living both among the rocks and in the tree-tops. They are hideous creatures. They ravage the crops and tear open new-born lambs to get at the milk inside them; and where the natives are timid and unable to harm them they become wantonly savage and aggressive and attack and even kill women and children. In Uganda, Cunningham had once been asked by a native chief to come to his village and shoot the baboons, as they had just killed two women, badly bitten several children, and caused such a reign of terror that the village would be abandoned if they were not killed or intimidated. He himself saw the torn and mutilated bodies of the dead women; and he stayed in the village a week, shooting so many baboons that the remainder were thoroughly cowed."

Baboons do not act singly, but in bands with leaders, with sentinels posted. Baboons, wolves, wild dogs, and primitive man are thoroughly organized for offense and destruction. It is because the object is offense and destruction that evil characteristics are most prominent—arbitrariness, irresponsible exercise of power, harshness, cruelty, with anarchy all along the line.

Some strong male, differing not in kind but merely in degree from his fellows, has fought his way to the top, is given allegiance, based partly on fear, partly on self-interest. He delegates power, or each lower rank of followers usurp power, and this results in anarchy all along the line. Are we now writing of the African baboons, of the wolf pack, of the paleolithic war chief, of the neolithic hunting, foraging, plundering, filibustering chief, of the enterprising New York Madagascar trader, of the respectable Rhode Island slave and rum trader and privateer; or are we writing of Roosevelt's land and marine experiences as a Rough Rider with our army and navy; or are we writing of the shops of the great industrial incorporations, of the operation and maintenance of our railroads? It is all one and the same thing, as they are all victims of a common type of organization resting on the same principles—individual arbitrariness at the top, usurped and delegated power down the line, anarchy everywhere.

Modern men have lost the fangs and the cruel hands of the baboon; in them also his savage, cruel instincts are softened. Modern sea captains are not such monsters of cruelty as Henry Morgan, modern generals are not as ruthless as Cæsar, Attila, Genghis Khan, Tilly, or even Napoleon. Men, thoroughly good, conservative, upright men, with every great upbuilding instinct, are happily at the head of most of our great institutions; they are infinitely better than the destructive organizations through which they are compelled to work, knowing no other; but the old danger is always latent. We who know could fill volumes with modern illustrations of the ever out-cropping evils due to the destructive type of organization.—Engineering Magazine.

A NEW MICROPHONE.

A NEW microphone has been patented by the Berlin house of C. Lorenz; it differs from all previous constructions by the use of a substance which is heat-resisting and a good conductor of electricity and exhibits considerable variations of electrical resistance, even with very slight pressure oscillations.

It is well known that of all solid substances suitable for use of microphone contacts, carbon has yielded by far the best results. Its use, however, offers the serious drawback that under the influence of the electric current the sensitive contacts gradually become reduced to ashes, so that carbon microphones, after more or less time, become less efficient or even entirely unserviceable. This effect is particularly disturbing when high tension currents are used. For this reason the employment of carbon in microphones intended to operate with currents of high intensity has been possible only, thanks to the use of special cooling arrange-

ments, and even then only within rather restricted limits.

In the new type of microphone, instead of the pure carbon used hitherto in the manufacture of sensitive contacts, there is employed a carbon modified chemically by a special treatment. Experiment has shown that carbon silicide (silundum), produced by heating carbon to incandescence in an atmosphere of highly heated silicon vapor, is particularly suitable for this use. Such carbon silicide is much more refractory than ordinary pure carbon. Owing to this characteristic, it enables speech to be transmitted much more efficiently than with the usual devices. The microphone efficiency of silundum remains high even when currents of extraordinary intensity are employed. This new material, therefore, can be used for ordinary microphones and also for microphones operated with currents of great intensity.

Thanks to the readiness with which this material

can be reduced to the form of powder, granules, globules, rods, etc., the manufacture of a sensitive contact becomes very convenient, the more so since the microphone diaphragm can be prepared readily with the same material.—Cosmos.

It is pointed out that M. Paulhan's time for his great flight from London to Manchester was considerably less than that of the average train, and only 41 minutes more than that of the fastest express now running, as the following figures show. Average time of sixteen regular daily trains, 4 hours 28 minutes; the fastest express journey, 3 hours 30 minutes; M. Paulhan's actual time in the air, 4 hours 11 minutes. A London and North-Western train was in attendance on M. Paulhan throughout his journey, the route of which was practically identical with that of the company's line from London to Manchester.