The "Medical Age" thus Defines Rest.

Rest is *repose*, or *inaction*, of a portion of the organism, during which the waste caused by the wear and tear of work is repaired—repose of a *portion* of the body, for during life we never find the whole at rest. From the time that the first blood globule begins to oscillate in the rudimentary blood vessel until the last sigh dies away in the stillness of eternity, there is no such thing as complete rest.

Human beings are so constituted that they cannot exercise all their faculties at one time. They stand on one foot and rest the other; listen with one ear and then the other; look with one eye while the other is loafing; walk until tired, and then sit down to rest; and when weary of an easy chair, get up and take a walk to "stretch the limbs." They talk until their tongues are tired, and then stop to think of what they will say next. So they go on throwing one set of wheels out of gear to let them cool off and get oiled up, while they set another portion of the machine running. Even in sleep, in which they come the nearest to complete rest, they are still hard at work. While the brain is standing almost still, the senses locked up, and the muscles relaxed, there are countless thousands of busy laborers at work, oiling up the whole machinery, replacing a worn-out cog here and there among the wheels, and sweeping out the dust and debris worn off by the friction of the machinery of this great manufactory of thoughts, words and deeds. When the day workmen stop, the night laborers go on duty, and some of the most skilled artisans are busy during sleep repairing the tissues.

The work that we do during the day with our heads and hands is what we get credit for; but when we rest and sleep, there is an important work going on. That branch of labor performed while we rest is unseen, and, for that matter, unknown by the majority of us, and hence is often neglected.

We are so constituted that the normal, healthful exercise of our faculties gives pleasure. It is pleasant exercise to eat when one is hungry; torest when weary; to walk when the brain is fresh and clear. In fact, to do anything rational, when thoroughly prepared by previous rest, is agreeable. This is not only true of head and hand work, but also of the natural exercise of the feelings and emotions. When trouble comes, the feelings are wounded, relief is found in complaining and sorrow, and pain is washed away by tears. The Omnipotent set a limit also to human sorrow and suffering. These storms of affliction break over the healthy man or woman, and subside after a shower of tears and give place to the sunshine of hope and happiness. It is the weary and worn who cannot rise above their troubles, who go fretting and sighing in search of rest.

A well preserved nervous system can stand an occasional attack of righteous indignation in which considerable strong temper or passion may be manifested, if time is taken to fully cool off between the heats. It is the continual fretting, grumbling, and growling, without intervals of rest, that is wearing and injurious.

The law of harmony between work and rest, when fully obeyed, not only maintains strength, but develops it. All intelligent people know that fact, but many fail to think of it in such a way as to be governed by it. To exercise the muscles of the arms until they are tired and thoroughly rest them, and again exercise and rest, makes them grow stronger and bigger. So with the brain, it becomes stronger under well regulated exercise and rest.

Let us give a moment's attention to the various ways of resting.

First and most important of all, "Nature's sweet restorer, balmy sleep." Of all the ways of resting, this is the most complete and important. The time devoted thereto should not be regulated by hours so much as by the requirements of the individual. Some one, perhaps Franklin, said six hours for a woman, seven for a man, and eight for a fool. A little girl friend when told this, said, with much wisdom, "I like the fool's share." While admitting that some sleep too much, the majority get less than they need. Sleep should be taken with great regularity, and be free from all disturbance. Sleepless nights are often spent because of being too irritable from fatigue to rest.

One ought to stop work long enough before retiring to cool down to the sleeping point. Hunger, too, will chase away sleep. We would not recommend late suppers, but some easily digested food taken at bedtime, when needed, will often secure a sound night's sleep. We are told that "He gives His beloved ones sleep," and we know that there is much truth contained in this passage. The consciousness of being right and having done well is the best anodyne, the best sleep producer. There is none too much sleep for the righteous, but there is less rest for the wicked who violate the natural laws.

In addition to the good night's sleep, it is a good plan to take a short nap in the middle of the day. It divides the working time, gives the nervous system a fresh hold on life, and enables one to more than make up for the time so occupied. It is well to guard against too long a sleep at such times, since such is apt to produce disagreeable relaxation. There has been much discussion regarding the after-dinner nap, many believing it to be injurious, but it is nevertheless natural and wholesome.

Much can be accomplished in the way of resting, short of sleep. It is very important to economize the opportunities for rest during working hours in the day. The great principle which underlies daily rest is relieving of one portion of the organization from duty while the others are at work. This can be done to a great extent. When the muscles are tired and worn from mechanical work which requires but little attention of the brain, stop motion and set the brain at work. The laborer can read, think, and speak while his weary limbs are at rest. His brain need not be idle because the hammer or chisel has dropped from his weary hand. On the other hand, a man can work with his hands when his head is tired. The bookkeeper whose head is weary with business facts and figures by five o'clock in the afternoon has considerable time in the evening to sing, play, dance, dig in the garden, or black his boots, all or either of which he may do while his head is partially at rest. There is another very important way of obtaining rest mentally, that is by changing from one occupation to another. The dexterous gold beater when he finds one arm getting tired takes the hammer in the other; and so may the man who hammers thoughts out of his brain exercise oue set of mental functions while the others are at rest. One may read until tired, and then write; may acquire knowledge until weary, and then teach to others.

R. S. V. P.

"I always make it a point," remarked a manufacturer to a representative of *Age of Steel*, "to reply to every communication of a business nature addressed to me. It doesn't matter what it is about, provided only that it is couched in civil language. I do this because courtesy requires that I should; but aside from that, I find also that it is good policy. Time and again in my life I have been reminded by newly secured customers that I was remembered through correspondence opened with me years before, and many orders have come to me through this passing and friendly acquaintance with people. On the other hand, I have known plenty of business men whose disrespectful treatment of correspondents has been bitterly remembered and repaid with compound interest. Silence is the meanest and most contemptuous way of treating anybody who wishes to be heard and to hear, and resentment is its answer every time."

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or in this department, each must take his turn.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(2505) Reader asks (1) for a formula for taking greasy spots out of clothing without injury to the cloth. A. Use benzine or chloroform. Apply it with a sponge in a circle all around the spot, then apply more until the spot is reached, when you must sponge it off thoroughly. 2. What is a good glue for mending broken dishes? A. Try cement as below or using the whey from one-half pint of milk curdled with vinegar. Mix with it the white of an egg and pulverized quicklime. After applying, dry in the air and then over a fire. 3. What are the ingredients of artificial honey? A. Soft water 6 pounds, pure best honey 3 pounds, white sugar 20 pounds, cream of tartar 80 grains, essence of roses 24 drops. After 5 minutes' boiling take from fire and add the well beaten whites of 2 eggs, and when it is nearly cold add two pounds more of honey. Sometimes a decoction of slippery elm bark is added, but it is liable to cause fermentation in hot weather.

(2506) C. F. C. H. asks for the formula for cementing meerschaum. A. Dissolve caseine in a solution of water glass (silicate of soda) and stir into it calcined magnesia and use at once. Caseine is prepared by allowing perfectly skimmed milk to stand until it curdles, when the caseine is filtered out and washed on the filter. To simplify above a little fresh cheese may be boiled in water and mixed with slaked lime and ashes, using 10 parts cheese, 20 parts water 2½ parts lime and two parts wood ashes.

(2507) J. T. N. writes: 1. Will you give receipt for laundry starch? A. We refer you for laundry work to the SCIENTIFIC AMERICAN, Vol. 62, No. 9. 2. A receipt for laundry blue, dye or liquid forms. A. Solid bluing formerly consisted of a mixture of indigo and starch. At present artificial ultramarine is largely used. Liquid bluing may be made by dissolving 1 ounce of soft powdered Prussian blue in 1 quart rain water in which ¼ ounce oxalic acid has been dissolved. A teaspoonful is enough for a large washing of clothes. 3. Name a good book on flavoring extracts. A. For information on flavoring extracts we can supply you with "A Treatise on Beverages," by Sulz, price $10, which contains information on the above named subject. 4. And one on perfumes. A. We can supply you with "A Comprehensive Treatise on Perfumery," containing a history of perfumes, by Cristiani. Price $5.

(2508) R. S. asks (1) how to make prepared flour. A. For every 4 pounds of flour add ¼ ounce each of baking soda and tartaric acid. 2. Whether it can be mixed without going to the expense of buying machinery for the purpose of mixing same. A. It is a question of mixing. It must be most thoroughly and perfectly mixed. Add the chemicals separately and in small portions distributed through the flour, and pass the whole through sieves to insure mixing.

(2509) D. S. McK. asks (1) how water color paint is made (red, blue, and green), the kind flour barrel heads are painted with. A. The colors may be mixed with weak size, or an oil paint thinned with turpentine may be used. 2. How phosphorescent paint is made, *i. e.*, the kind that shows a sort of a light in the night (often found on match safes). A. You refer to Balmain's luminous paint. Papers on its use, preparation, etc., will be found in our SUPPLEMENT, Nos. 229 and 249. 3. What form will compressed air assume when it is pumped into an air-tight vessel? Does it become warmer or cooler, and does it hold its warmth or coldness for any length of time? A. It becomes warmer, but soon loses its heat by conduction through radiation from the sides of the receiver.

(2510) C. N. V. asks: In burning rock for hydraulic cement, with soft coal, what proportions of rock and coal are used? Are the rock and coal put in the kiln in layers or mixed together? A. The burning of cement rock is referred to in Gillmore's "Limes, Hydraulic Cements and Mortars," page 127. 3,500 pounds of anthracite he states is sufficient to produce 30,000 pounds of cement. The fuel and stone are placed in layers, the stone not exceeding a thickness of 6 inches. Bituminous coal will not vary greatly in results from anthracite.

(2511) J. H. N. asks: 1. How many cubic feet of gas can be produced from 50 pounds of dry oak wood and from 50 pounds coal (the kind used ordinarily under steam boilers)? A. About 225 cubic feet in each case. 2. Which gas is of most value for heat purposes? A. The coal gas.

(2512) J. H. P. asks (1) how long a patent holds good in the United States without renewal. A. 17 years. 2. Whose work on electric lighting and power you would recommend for a person having slight experience, on wiring and care of dynamos? A. We refer you to our catalogue of electrical books sent on application.

(2513) J. W. T. asks: What paint or other substance, resinous or mucilaginous, will withstand the action of ammonia for a protracted period, that is, will serve as a coating or packing for uniting a valve and its seat, and which will be readily separable at a moderate pressure, and without regard to the time in which the device containing the ammonia may remain undisturbed? A. Ourbest suggestion is for you to try a solution of gutta percha in bisulphide of carbon.

(2514) W. D. T. asks if there is any known way to electroplate iron? A. Regular electroplating processes are used for iron. It is necessary to give it a thin deposit of copper before silvering. The same is advisable before nickel plating. Steel knives are silver or nickel plated in great quantities, and many other iron or steel articles are electroplated.

(2515) M. F. W. asks (1) how to clean deer horns without polishing them with sand paper. A. Use a soft woolen cloth and ground pumice stone and water. 2. What is the best blacking for boiler fronts? I have been using asphalt, and it scales off after a week or two. A. If in good condition, use stove polish or simply wipe off from time to time with greasy waste.

(2516) J. R. J. asks for the best and cheapest receipt to make the commercial acetate of chrome, 30° B. A. It is simply made by mixing together solutions of lead acetate and of chrome alum or of sulphate of chromium. Of the salts there are required for 250 parts chrome alum or for 98·2 parts chromium sulphate (dry) 284 parts lead acetate. By evaporating or adding water its strength may be adjusted. The chromium sulphate gives the finer product.

(2517) C. H. K. & E. W. D.—Typewriter copying ink may be made from aniline colors dissolved in alcohol and added to glycerine. Dilute with water and apply to the ribbon. Castor oil may be used instead of glycerine.

(2518) C. H. M. writes: What is the ordinary or mean cost in this country of one electric horse power per hour or per day, where coal is used as a fuel, and the elastic current is generated by a steam engine running a dynamo? When we are told that it requires so many electric horse power per hour to effect a given purpose we would like to know, approximately at least, what this represents in cost. A. Any specific estimate would be for most cases misleading. It would vary not only with the cost of coal and of labor, but also with the size of the works. The larger the works the lower would be the cost of generating power. The following data give a basis for estimates. Fuel consumed per horse power of boilers per hour, 2 to 5 pounds, loss on generating dynamo 10 per cent, loss on customer's motor 10 per cent, loss in transmission variable from 1 per cent upward. Labor the same as for any steam plant of similar size. Superintendence variable.

(2519) O. A. K. asks for the principle by which the true per cent of proof spirits is calculated, having given the indication of the hydrometer and the temperature. For example: Say the hydrometer shows indication to be 110 and the thermometer indicates temperature of 82°, what is the true per cent of the spirits and how calculated? A. The direct readings of the hydrometer you speak of refer to proof spirits. A mixture of 50 parts alcohol and 53·71 parts water contracts on mixing and the resulting liquid contains one-half its volume of alcohol. This is proof spirits, *i. e.* spirit containing 100 per cent of proof spirit. If the hydrometer reads 110, the spirit is 10 over proof or is equal to 110 per cent of proof spirit, or about 55 per cent of pure alcohol. The temperature has to be allowed for and corrections applied by tables, issued with full instructions and explanations by the United States Treasury Department. If you will test your spirits at 60° Fah., no correction is necessary, and the direct reading may be taken as above.

(2520) J. H. H. asks how the Archimedian screw is constructed—the diameter of the tube, the diameter of the cylinder about which the tube is coiled, and at what angle the screw must be placed to insure successful operation. A. It may be made by winding a tube around a cylinder or by dividing a hollow cylinder by a helicoidal partition. Taking the case of the cylinder, the element or line drawn from the center of a convolution through the axis to the center of the opposite lower convolution determines the working angle. The screw must be placed at such an inclination that this line will be a little inclined to the horizon, the end corresponding to the highest convolution of the screw being lower than the other. They are used at an angle of 45° to 60°. In our SUPPLEMENT, No. 596, you will find an example of their use in practice.

(2521) W. M. C., Nantucket, says: There is a valley on the outskirts of the town where, by putting one's ear to the ground, a noise is heard like the cooper's hammer, as he drives a hoop on a cask. I can trace it back over a hundred years. It can be heard only in that spot. Can you tell me the reason and do you know of a similar case? A. It is probably an acoustic effect like the roar of the sea in a conch shell. Possibly akin to the singing sands, which make a noise by the blowing of the wind.

(2522) H. H. H. asks: Does sound exist independent of the sense of hearing? Will a lump of iron, if dropped in the ocean where it is six or eight miles deep, sink clear to the bottom, or will it, at some great depth, remain stationary? A. Sound, as we understand it, does not exist independently of our ability to hear. It is caused by vibration which may exist in all conditions and intensities, but is not realized as sound until recognized through the organs of hearing. The lump of iron will sink to the bottom of the sea at all depths.

(2523) S. V. F. asks: A man buys twenty pencils for twenty cents. The prices are two for a cent, four for a cent, and four cents each. How many of each did he get? A. This problem can be done easily by using two simultaneous equations each of three unknown quantities and by tentatively assigning values to one quantity, determining the others. The answer is three pencils at 4 cents, two at four for a cent and fifteen at two for a cent. The equations are $x+y+z=20$ and $4x+\frac{1}{4}y+\frac{1}{2}z=20$. Possible values of x are 1, 2, 3, and 4—to be used tentatively.

(2524) C. H. L.—For removing ink, a mixture of tartaric and oxalic acids is often used. Javelle water is also of use for some cases.