NEW DISCOVERIES ALL OVER THE EARTH

How Science SOLVED the RIDDLE OF RHEUMATISM

Great Importance of the Discovery That a GERM Causes this PAINFUL DISEASE

By William Brady, M. D.

IT is with a feeling of sadness that we witness the encroachment of the new upon the old—we old timers. It makes us realize in a very intimate way how nearly senile we are getting to be.

Some of us strive earnestly to keep up with the times; we go in for all the fads and fashions of the day; we venture to trip the tango or the turkey in the whirl of youth; we wear gay, "classy" clothes and cultivate the company of the younger set and all and all—but in divers ways and in spite of all dissemblances the grim conviction is forced home to us that we are not keeping pace with the march.

Almost daily we make some little slip that betrays us. If in no other respect, then in gossiping about our health. One's health is always a proper topic of conversation; it is more available than the weather itself because after all it is hard to say anything original about the state of the weather. But even the ills of flesh are changing with the process of the suns.

If you want to be up to the minute you may have neuritis, myositis, cynovitis, bursitis or arthritis, but you must not have "rheumatism" any more.

"Rheumatism" is now nothing but a vulgar almanac complaint—the kind of trouble Uncle Ebenezer thinks he has when he motors to town, after prolonged research, to buy a one-dollar bottle of sarsaparilly, to purify his blood, for seventy-nine cents at the dry-goods store. "Rheumatism" is a blanket title for those aches, pains and lamenesses which accumulate over Winter and cry out for relief at plowing time in the Spring. It is what ails you when you have to be your own diagnostician.

The beauty of "rheumatism" is its impenetrable atmosphere of mystery. Nobody knows what he is talking about when he talks about "rheumatism"—nobody but the almanac publisher and the proprietary medicine manufacturer, and neither of these fellows will ever tell. Since no one knows what it is it becomes obvious that no victim of the complaint can be quite sure, until he tries a few bottles, that any old remedy offered won't help him a bit.

Wherefore it follows as comfortably as you could wish that any person having a job lot of drugs, foods or appliances he can't dispose of legitimately, will find a ready market by advertising the goods in the medical and lay press as a good thing for rheumatic conditions. And since we are all so eager to rush into print there will be no lack of warm testimonials to keep the business going. Under the influence of a pleasantly medicated bracer one will say or do almost anything to accommodate a friend.

Nevertheless rheumatism, as a near-diagnosis, an almanac complaint, a fulcrum for the promulgation of nostrums, is passing. Masquerades are no longer fashionable in medicine. The "rheumatiz" is not long for this world. Even now it exhibits signs of approaching dissolution, it is suffering from exposure and feeble circulation, and if our prognosis is not utterly at fault rheumatism will be as obsolete in another generation as the scrofula of our forefathers is to-day—the title, we mean—and as uncommon as smallpox—the conditions confused under the title, we now mean. True, current medical literature still summons rheumatism to fill a vast void occasionally; and so it does a "cold"—whatever that may mean. For doctors, like ordinary folk, are fond of phrases.

A century ago rheumatism covered a great many more mistakes than it does at present. To our benighted forefathers pneumonia, pleurisy, bronchitis, tonsilitis and even common coryza were all "the rheum."

The word rheumatism is derived from a Greek root meaning "catarrh, a flow." It is scarcely fifty years since tuberculosis of joints was differentiated from rheumatism, and within our generation some half dozen other specific diseases have been split off from the group called rheumatism. Such refinements of diagnosis as neuritis, myositis, bursitis, synovitis and arthritis—representing intelligent efforts to determine what is really the matter with the patient—are still so new that comparatively few lay readers have any idea what they mean. Of late years, indeed, the old hen rheumatism has covered with its motherly wings only a dwindling, nondescript brood of orphaned joint troubles which failed to find a home anywhere else.

Over in England, where one would think they ought to know rheumatism if anybody knows it, unromantic practitioners forty years ago began to wonder if the weather, bad as it was, could be the sole cause of such a protean disease. One timorous scientist even expressed a theory that microbes had something to do with it—much to the amusement of his compeers.

Hands and Lower Limbs of a Sufferer from Acute Rheumatoid Arthritis. It Was from Joints Affected as This Man's Are That Professor Rosenow Took the Germs Which, When Injected Into the Veins of Dogs and Rabbits, Produced Similar Joint Troubles. These Experiments Helped Establish the Fact That Rheumatism Is Caused by a Germ and Not by What You Eat or the Climate in Which You Live.

Alfred Mantle, consulting physician to the Royal Halifax Infirmary, wrote a thesis entitled "Rheumatism Considered from the Bacterial Point of View" away back in 1877, before bacteriology had cut its milk teeth. Mantle's idea was severely frowned upon by the eminent examiners of the university as the wild dream of an inexperienced young upstart—because in those days every fool knew that rheumatism, pneumonia, consumption and the like were mere consequences of exposure to the obdurate weather which prevailed in those parts.

That painful and serious condition called acute inflammatory, or acute articular rheumatism, or rheumatic fever, or acute multiple arthritis, has been looked upon as probably of infectious origin for the past decade. But so-called chronic rheumatism, including all the joint troubles not identified specifically, has remained a matter of guess-work and controversy within the medical profession and a veritable hodgepodge of the imagination without the profession. Chronic rheumatism, in short, has been and still is in too many instances a fair target for all the conventional and unconventional modes of treatment human ingenuity has been able to devise. And in the rare instances when recovery has followed any particular brand of treatment no one has been able to furnish a satisfactory explanation as to how the recovery has been brought about.

The one best bet—and the worst—is the fake nostrum maker's battle cry, that the treatment "drives out the uric acid," an explanation which would be eminently satisfactory but for the fact that scientific tests prove that neither an increase nor a diminution of the amount of uric acid in the body occurs with joint disease or with recovery therefrom.

Since Alfred Mantle's time scores of original investigators have added their testimony to the "bug" theory of rheumatism. British, French, German and American clinicians and bacteriologists have contributed, point after point, a scientific working knowledge of the nature of rheumatism, building up a sound hypothesis upon Mantle's idea. Within the past two years this constructive hypothesis has attained maturity. Certain epochal discoveries by American bacteriologists and physicians have supplied the answer for the age old riddle: What is rheumatism? Thanks to Mantle's childish dreams, and the work of those who followed in his footsteps, medical art to-day is restoring despairing invalids to health, curing the incurable chronic rheumatism.

On April 11, 1914, the rheumatism-weather tradition definitely expired. On that day a thousand-word preliminary note entitled "Etiology of Arthritis Deformans," by E. C. Rosenow, M. D., a Chicago bacteriologist, appeared in the Journal of the American Medical Association, in which Rosenow described researches which establish the specificity of at least one species of bacteria, the Streptococcus viridans, in the causation of the kind of rheumatism doctors call arthritis deformans or rheumatoid arthritis.

This particular germ Rosenow found in the lymph-nodes in the region of affected joints in a large number of cases, and by injecting cultures of it into the veins of dogs and rabbits he was able to produce specific joint lesions, which, he observes, "would parallel the condition found in the patient from whom the strain (of germs) was isolated."

This specificity noted by Rosenow in the Streptococcus viridans is of the utmost importance. The impression has long prevailed that most of these cases of joint trouble were of bacterial origin, rather than the result of dietetic or climatic conditions, but physicians have been either timid or indifferent about putting the theory to the test in actual practice.

That is, if a possible port of entry or septic focus for the propagation of the suspected germs has been recognized in a given case, such for instance as a chronic pyorrhoea (Riggs disease of the gums), or a chronic pelvic inflammatory focus, no very radical effort to remove or clean up the focus has been made, because the physician has lacked confidence in the efficacy of radical measures, or, perhaps, the patient has preferred to ignore the seemingly unimportant focus in his anxiety to have the rheumatism relieved.

Rosenow's work, then, convinces the physician beyond peradventure of the need for just such radical procedures in the treatment of chronic joint disease. It furnishes the clearest scientific proof that certain bacteria have a particular affinity for certain tissues, like the synovial lining of a joint or the fascia near a joint or the muscles over a joint. And this affinity, as Rosenow shows, is quite constant for a given strain of germs.

(To be concluded next Sunday.)

How We Came To Be SO AFRAID OF SNAKES

THE great majority of snakes found in this country are entirely harmless, being without venom or fangs.

Yet almost everybody, when unexpectedly brought into close proximity to any kind of a snake, large or small, venomous or non-venomous, or even to anything resembling a snake, is suddenly seized with a panic of fear and the impulse to flee as if the very sight of it were deadly.

The fear of snakes is really a deep-seated animal instinct which has survived long after the conditions that gave it origin. Its persistence, science now believes, is evidence that the human race originated in India or some other part of tropical Asia where all sorts of venomous serpents have always been abundant.

Man's instinctive horror of serpents probably originated during the countless generations when he was slowly climbing up from his animal ancestry. Being without fire and without clothing or shelter, he was peculiarly defenseless against the deadly serpents which constituted the greatest danger and the greatest menace to the survival of the race that he had to encounter.

The idea that India was the cradle in which the white race acquired the dread of serpents that persists to the present day has a number of things to support it. One is the fact that India has always been infested by venomous snakes. Notwithstanding the efforts of the British authorities to suppress the evil over 20,000 persons died last year as a result of the attacks of serpents. In prehistoric times conditions in this respect were probably much worse.

Our serpent fear is very similar to a form of fear displayed by horses. Everybody who has ever had anything to do with horses knows what an insane and uncontrollable fright they exhibit at sight of some unfamiliar wayside object.

Why do horses behave in this way? Because the sight of such an object represents, to them, just as the sight of a snake does to men, a danger which at some far distant time was the great peril that threatened their development as a race.

This danger took the form of lions, tigers and other ferocious beasts of prey that lay concealed in the jungles waiting for a favorable opportunity to spring upon passing horses and devour them.

The horse had no means of defense against this danger except alertness in eluding the spring of his enemy and fleetness of foot in escaping pursuit. The individual horses that developed these protective qualities most highly survived, while those that failed to reach the necessary standard of efficiency fell victims to their enemies.

We now see, thousands of years after the domestication of the horse, that he suddenly falls into a senseless panic and flees at break-neck speed from an imaginary danger behind. So terror-stricken does he often become over the imagined danger behind that he becomes heedless of real dangers ahead and rushes on to a broken neck.

There seems to be little doubt that the instinctive fear of imaginary dangers in the horse, and the same kind of fear of serpents in man, had a similar origin in the early experiences of both.

Such a QUEER EGG!

The Freak Egg, Laid the Other Day by an Ohio Hen.

NO, this is not a ten-pin or a water bottle or a dumbell or an old Egyptian vase or any of the things it looks like. It is an egg laid a few days ago by a full-blooded Plymouth Rock who enjoys the distinction of being one of the greatest egg-producers in the State of Ohio.

As the photograph shows, this egg is certainly the queerest that ever came from a hen. It is nearly as large and weighs as much as three ordinary hen's eggs and the shell is unusually thick and firm.

This is the first freak egg this particular hen has laid. She has, however, always been remarkable for the number and size of her egg.

Why It Is That SAVAGES ARE NEVER NEAR-SIGHTED

IT is a curious fact that savages are never near-sighted. Their sight is clearer and more distinct than that of the strongest eye of any civilized man. To understand why this must be so it is necessary to first make plain just what near-sightedness is.

Near-sightedness is due to undue length of the eye, which causes the parallel rays of light to unite not on the retina, but in front of it.

Now, while nature has achieved the seemingly impossible in fashioning the eye, which consists of crystalline, clear living tissue, it is not inert, in spite of the wonderful clarity of the substances that compose it.

If it were an inert mass, then it would be able to focus only perfectly parallel rays of light, that is to say, rays striking it after travelling a long distance, and this would mean only distant objects could be visualized. Consequently the muscles of the eye must make an effort in order to visualize near-by objects.

In the normal eye, this effort, unless unduly prolonged, is part of the day's work, and has no bad after effects. But if near-sighted persons continue to make this effort, forcing the muscles of the eye to perform an uncalled for amount of work, instead of correcting the defect by wearing concave glasses, which will focus the light right upon the retina, instead of in front of it, they will ruin their eyes past redemption.

The eyes of a child of ten can gather in rays of light coming from very close range—rays which are as near-by as six and seven-tenths inches. But after the tenth year this power rapidly declines.

The decline of this power is undoubtedly due in part to the work required of the child in school. After the tenth year the human being in civilized countries is forced to spend a great part of the time in poring over books either to read or write.

The child is admonished not to allow his attention to stray, but to apply himself diligently to the work in hand, when he should be taught instead, that, while reading or writing, he must glance up every few seconds and look at a distant object, as a tree to be seen through the window, or the chimney of a far-off house. In keeping his eyes riveted on the book right in front of him, the child is doing the worst possible harm to his eyes, for such continual application to a near-by object changes the form of the eye, and produces that elongation which results in near-sightedness.

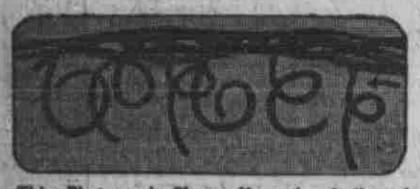
The reason why the savage is never near-sighted is that he lives an outdoor life, knows nothing of books and pictures. What manual labor he performs is performed in the open air, and the manifold dangers which surround him, the beasts of the jungle or hostile tribes, make constant vigilance and an alert scanning of the horizon necessary.

There is no better remedy for keeping the eyesight in good trim than to look up every few seconds from one's work, focussing the eyes on a distant object. A moment devoted every now and then to this corrective exercise will be of the greatest benefit to the eyes.

So important is this care of the eyes considered that in many large manufacturing establishments where close, confining work is done, theh foremen are expected to see to it that employes lift their eyes from their machines for a second or two every now and then.

If such a practice were followed in our schools there would be far fewer near-sighted persons.

SURPRISING THINGS That LIGHT DOES TO PLANTS



This Photograph Shows How the Stalks of Leaves Curve Towards Light Coming from the Direction Indicated by the Arrow.

This Photograph Shows How a Geranium's Stalk Behaves When Split Up to the Apex and Exposed to Light Coming from the Direction Indicated by the Arrow.

IN the whole realm of science nothing is more wonderful or of greater importance to mankind than the behavior of plants under the influence of light.

In growing plants carbon dioxide and water are transformed into starch and sugar. This transformation can take place only through the action of light upon the substance known as chlorophyll, but exactly how it is effected we do not know.

Of the light that falls upon a green leaf a part is reflected from its surface, a part is transmitted, and another part is absorbed. That which is reflected and transmitted gives to the leaf its green color; that which is absorbed, consisting of red, blue and violet rays, is the source of the energy by means of which the leaf is enabled to carry on its work.

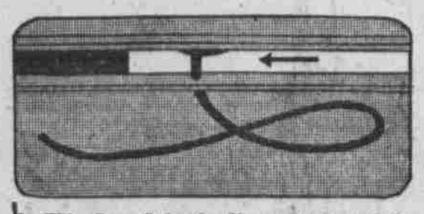
We have only to look at any of the plants around us to see how successfully they contrive to arrange their leaves to obtain the maximum advantage from the light that falls upon them. A plant organ responds to the directive influence of light by a curvature which places it either in a direct line with the rays of light, as in grass seedlings, or at right angles to the light as in ordinary foliage leaves.

When the leaf stalk or blade reaches the position of maximum advantage, the movement toward the light ceases and it then remains fixed, save for some slight rotating motions, until either the direction of the light changes or its intensity is decreased. We do not yet know by what means the plant is able to adjust its position to the rays of light, nor just how it perceives that it is or is not in the most advantageous position.

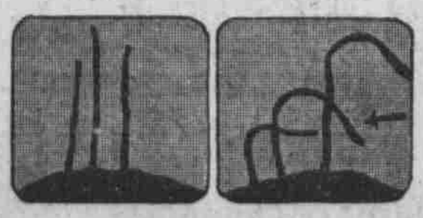
Recent experiments seem to prove that the perception of light is located not in the blade of the leaf, but in the stalk. When stalks are exposed to the light and the blades kept in the dark, the stalks all curve distinctly toward the light. But when the blades are exposed and the stalks kept in the dark, the latter show no definite curvature toward the light.

Other experiments show that it is the upper part of the stalk which perceives the light and which has the power of inducing a motor response in the lower half.

Not only is the stalk capable of perceiving light, but it can distinguish between the different kinds of light. Although the plant absorbs rays of light both at the red end and at the blue end of the spectrum it responds mainly to those at the blue end.



In This Case Only the Upper Portion of the Plant's Stalk Is Exposed to the Light, and Yet the Unexposed Part Curves Under the Light's Influence in the Curious Manner Shown in the Photograph.



On the Left, Three Leaves Placed Upside Down with Their Stalks Vertical. On the Right, the Same Stalks as They Appear When Exposed to Light Coming from the Direction Indicated by the Arrow.

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SCIENCE NOW KNOWS...

New Use for Hopvines.

ONE of the latest results of the efforts of Germany's scientists to aid the Fatherland is the discovery that hopvines make an excellent material for paper, jute and charcoal.

Paper Made from Grass.

A SPECIES of wire grass which is common on the Pacific Coast has been found to have just the degree of toughness which makes it an excellent substitute for wood pulp in the manufacture of paper.

Why Tires Get Hot.

IT is a mistake to think that automobile tires are hot after a long, fast run because of their friction on the road. The heat is really due to friction inside the tires themselves, due to the fact that the various layers of which they are composed do not act uniformly as the tires are deflected by the road.

Winding Watches by Electricity.

IN a New York watch repairing establishment, where more than seven hundred watches have to be wound every day, an electrical apparatus has been installed to do the winding. It does the work more efficiently than human hands can, and takes the place of several men formerly required for this work.