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EFFECT OF STARVATION ON THE BLOOD.

During the last hour of Dr. Tanner's forty days' fast, some of his blood was withdrawn from the hand and subjected to a careful microscopic examination by Dr. P. H. Vander Weyde. It was found to be entirely different from healthy blood. The corpuscles, which are otherwise smooth and round flat disks, with a depression in the center, and of an average diameter of 1-3600th part of an inch, were found to be ragged, irregular, and shrunk to the average of about 1-5000th part of an inch in diameter.

When blood is given time to dry on the microscope slide, the corpuscles may lose their smooth appearance and become smaller by shrinkage, but in this case there was no chance to be misled into error by such a cause, as the blood was examined while perfectly fresh and the corpuscles still moving freely in the plasma.

This ragged appearance was so common in all of them that there was scarcely a smooth corpuscle among them, except the white ones, which had very nearly the normal size and were smooth. Their number, which ordinarily bears to the red corpuscles the proportion of 1 in 400, was apparently increased, as in a field covering a diameter of 8000th of an inch, and containing 40 corpuscles in its diameter, nearly touching one another, a dozen white corpuscles were seen. As this field contained 20 x 20 x 3-14 or 1,256 corpuscles, it gives an average of nearly 1 white corpuscle in 100. Occasionally the white corpuscles were seen clotted together in a way never observed in normal blood.

A further study of these abnormal red corpuscles showed that their rough appearance was generally caused by points projecting from their surface, and looking like a fungoid growth which covered them, while in many this growth appeared to be taking place at the expense of the corpuscle itself and living on its substance, as the corpuscles most densely covered were the smallest and the most irregular in shape; in fact some of them appeared disintegrating and breaking up.

We represent here some of the corpuscles as they appeared in the blood of Dr. Tanner, as seen and drawn by Dr. Vander Weyde, and at the side of the healthy blood the contrast is striking.



Appearance of the Corpuscles of Normal Human Blood.



Appearance of the Corpuscles of Dr. Tanner's Blood after Forty Days of Starvation.

It is a common law observed in organic substances that when a breaking up of the structure is impending, foreign living organisms spring up, and are sustained at the expense of the decaying organic body. Mould, and all kinds of fungoid growth, originate according to this law, while in infusorial life it reaches its highest development. In the latter case it appears intended to economize the organic materials of the structure, and in place of allowing them to decompose into their primary elements, and to be built up again by the slow and laborious process of vegetation under the influence of light, these organic materials are directly transformed into food for the larger inhabitants of water, and finally for fishes. In this way a long laborious course of natural successive operations is cut short and the decaying organic material made useful more directly.

If the formation of fungoid spores, which is of a vegetable nature, also serves a useful purpose (which is probable), is as yet a question to be determined by further investigation; but certain it is that such a growth is not confined to large masses, but even found on the surface of such small objects as the corpuscles of the blood; this in fact has been recently investigated by microscopists, especially Korel, and such growth was found upon the blood corpuscles of patients when seriously suffering from various malarious diseases, such as typhus fever, etc., also in the last stages of consumption; and they agree that this growth exerts a destructive influence upon the body in which it takes root.

The appearance of Dr. Tanner's blood verifies this opinion. Very few, if any, corpuscles were free from the fungus, and all appeared to have suffered and shrunk in size, while many of them had become irregular in shape, and evidently were breaking up. As it appears to be the function of the liver to secrete the effete blood corpuscles, the liver of Dr. Tanner must have been taxed greatly, and this would explain his biliousness during the latter stages of the fast, when he often vomited bile with the mucus of his stomach.

In regard to the latter its digestive powers are phenomenal. Immediately after breaking the fast at the exact hour that the forty days were ended, by eating a peach, he drank successively two large glasses of milk, ate half a watermelon, two beefsteaks, five apples, drank Hungarian wine, and had a good time generally, and was the next day already in good condition, gaining at the rate of five pounds weight every twenty-four hours.

The effect on the blood was already very perceptible twenty-four hours after breaking the fast. The fungoid spores had disappeared from a great many of the blood corpuscles, or, rather, perhaps, fresh ones had been evolved in the system, which is the most probable, as they looked as smooth and fresh as if they were entirely new. At the second day about half of the blood had become normal, while on the third day most all the corpuscles were restored; however, there were here and there still some imperfect ones, irregular in shape, as if they were remnants, and even some

of these were not yet entirely free from the fungoid growth.

Powers of endurance have been exhibited by various individuals, but we believe that none have ever gone through such severe and well authenticated test of physical endurance as Dr. Tanner, to whom at least the credit should be given to have practically demonstrated what man can endure when he, to use Dr. Tanner's own words, "once understands his own machinery and knows how to run it."

COLOR BLINDNESS IN CONNECTICUT.

A recent act of the Connecticut legislature provides that on or before October 1 next, the railway companies of the State shall cause every person in their employ, as locomotive engineers, firemen, conductors, brakemen, station agents, switchmen, flagmen, gate tenders, or signalmen, to be examined at the expense of the railroad company in regard to color blindness and visual power, and under such rules as the Board of Health shall prescribe; and any corporation employing a person not possessing a certificate showing that he has passed a successful examination shall be liable to a fine of from \$200 to \$1,000.

Two grades of certificates have been adopted by the Board of Health, the first grade being issued to engineers, firemen, and brakemen, the second grade to all other railway employes. The tests adopted are very severe, and the results have led to the circulation of a petition, signed by most of the railway officers in the State, asking the Board of Health to change the methods of examination. On the first day of the examinations first-class certificates were refused to engineer Charles Bullard, of the Shore Line Road, and engineer William Fisher, of the New York and New Haven Road, both of whom had been many years in the service. Mr. Bullard had run an engine for twenty-eight years, giving daily proof in all sorts of weather that his eyes were equal to the requirements of his calling; and when subjected to practical tests on the road by the president of the company Mr. Bullard gave ample evidence of strong and clear vision. In the same way Mr. Fisher satisfied the officers of his road that his visual powers were entirely adequate to the needs of the service.

When it became known that these old and well tried engineers were barred for failure to meet the exacting requirements of the examiners, the rest of the trainmen naturally began to question the fairness of such tests; and the officers of the railway companies were naturally not without sympathy with their men.

The examiners, on the other hand, insist that their tests are simple, fair, and unmistakably accurate; and that any method of correctly testing eyes for color blindness and strength of vision would condemn the men to whom certificates had been refused.

From an impartial point of view it really looks as though the over-niceness of theoretical hobby-riders might bring into disrepute the whole matter of visual tests for railway men and pilots; and that the evidence of practical visual power afforded by twenty or thirty years of recognition and obedience to railway signals, in the management of locomotives, certainly ought to count for as much as that obtained with a lot of colored crewels in as many minutes. The question is whether railway men can distinguish the red, green, and white flags and lights used on their roads under such conditions as obtain in actual life. The sorting of colored worsteds may be the best way to determine this question; but, in view of the results thus far shown, practical men may be pardoned for doubting it.

The World's Fair of 1883.—New York.

The first regular meeting of the Commissioners of the United States International Exhibition of 1883 began August 10 and continued three days. The temporary organization required by act of Congress was effected, and an executive committee was appointed, with sub-committees on finance, legislation, and sites. Provision was made for the opening of subscription books, September 15, at the office of the Farmers' Loan and Trust Company, fiscal agents. The commission will meet for permanent organization November 14.

An Improved Cotton Compressor.

Three years ago the average cargoes of ships sailing from New Orleans did not exceed 1,425 pounds of cotton per ton register. By use of the modern cotton compressors the average has been raised to 1,725 pounds. In a recent issue the New Orleans Price Current gives as evidence of the efficiency of the Morse cotton compressor the fact that the British ship Ben Lomond, of 887 tons register, lately cleared with 4,363 bales of cotton under deck (none in cabin or crew spaces). The cotton weighed 2,054,848 pounds, making 2,316 pounds to the ton measurement, the largest cargo per ton ever taken by a sailing vessel from an American port. The larger part of this cargo was "doubled." The cargo was tied by hand (colored men), and consequently without the 20 per cent advantage claimed for steam "band pullers." The cargo was thus 35 per cent greater than the average obtained with average compression, and the gain in freightage at the current rate was nearly \$4,000 for the single voyage.

The National Dental Association.

A mass meeting of dentists, representing the American Dental Convention, the American Dental Association, and two Southern societies similarly named, was held in this city, August 11, with a view to consolidation. About 150 delegates were present. The result was the organization of the National Dental Association, which hopes to absorb the other organizations.