MEDICINE

Doctor Tells of Conditions in Hospital at Addis Ababa

Varied Patients Include Native Abyssinians, Arabs, Hindus, Mohammedans, Europeans and Americans

AN UNUSUAL picture of conditions in a hospital in Addis Ababa as it appeared to a missionary doctor was read by Dr. Louis Faugeres Bishop, Jr., of New York City, at the meeting of the American Society for Tropical Medicine.

The conditions were described in a letter from Dr. Tesla C. Nicola of Zauditu Memorial Hospital of the Seventh Day Adventist Mission. Dr. Bishop had asked Dr. Nicola for information on the prevalence of heart disease.

Dr. Nicola's letter is not the catalogue of tropical diseases which makes up most reports on health conditions in Ethiopia. It is, instead, a one-doctor-to-another description of conditions and difficulties of hospital work in the Ethiopian capital. He writes, in part:

"I am sorry to say that we do not have statistics on the matter you are interested in (heart disease). That is, I cannot refer to individual cases from our records. The reason for this is that we are too new. The hospital has been in operation less than two years, and for several months there were no records kept. I have been here a little over a year myself. While we do keep a record now we do not have the cases classified so that the material is available. We have been too busy with the mass of details in getting a place like this started. It is quite different from a similar proposition in America.

Beds Filled

"However, we are adding to our help and I believe that should the request be repeated at some later date we will be able to serve you better. This is a 50 bed hospital and so far we are averaging about 50 a day. Our patients are as varied as could possibly be the case anywhere. There are the native Abyssinians. These are made up of the Amharas, Gallas, Somalis and other tribes all quite distinct. Our next largest class is the Arab. These have settled in here extensively. Then come the Hindu and the Mohammedan, which are here in large numbers. In addition to these we have a number of Europeans and a few Americans. The Europeans, so-called, are the Greeks and Armenians.

"The native Abyssinian eats a large amount of meat, usually raw. He also uses an alcoholic drink which is intoxicating. He does not smoke. The Arabs are heavy smokers for the most part but do not drink much here. The Indians are divided, as you probably know. The Hindu does not eat any meat or eggs and for the most part does not smoke or drink any liquor. The Mohammedan uses both or rather all three. I mention these facts as they have been interesting to me (and to us). They are all factors which we have been used to considering as having influence on disease.

Little Heart Disease

"Now as to the specific disease of coronary thrombosis: There are two physicians on the staff here and I have talked with the other man. We do not recall that either of us have seen a case in over a year. We do not have an electrocardiographic machine. However we see very little of any heart disease. That is especially true among the natives. We have seen several thousand natives in the past several months. This does not include those that were simply dressing cases. There has been a case of endocarditis now and then. The few cases of cardio-vascular-renal disease we have had have been in foreigners. At present we have three such in the hospital. One is a Greek man about 38 years old, another an Armenian woman about 65 years old and the third came in last evening and is a Negro man about 55 who came here from Jamaica three or four years ago.

"Our immediate vicinity, as is also true of most of Ethiopia, is not really tropical except in latitude. We are about 8,500 feet altitude. The temperature ranges between 58 and 65 degrees. It never gets hot though at times there is frost. I came here from California and I believe the climate is quite the same except it does not get as hot here as where we were in Los Angeles.

"Postmortem examinations are practically impossible to get here due to the ignorance of the people. The only one I have been able to do so far was on a woman who died after a blow or kick from another woman and the friends wanted to know what the cause of death was. The woman was not entered as a patient but the body had been brought for a diagnosis. They had the idea that we could view the remains and tell the cause of death. It was only by promising that only a little cut would be made and no charge that it was possible to get this opportunity. This case of course is not in your line but I mention it because it is interesting and it shows the difficulty of getting autopsies."

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BIOLOGY

Worm Eats Small Enemy Merely to Get its Weapons

WARRIORS lacking weapons sometimes raid their enemies primarily for the sake of capturing their arms. Some of the most exciting tales of strife are based on such heroic thievings.

From the world of lesser animal life that struggles in the water, a similar tale was brought to the meeting of the National Academy of Sciences by Prof. W. A. Kepner of the University of Virginia, and his associates, Drs. W. C. Gregory and H. J. Porter.

The hero of this small zoological saga is a worm, known scientifically as *Microstomum.* Its enemy is a creature called *Hydra,* belonging to a still lower order on the evolutionary scale. They live in freshwater ponds and quiet streams.

Hydra possesses hundreds of little daggers, in the form of explosive stinging cells. With these it paralyzes and captures its prey, and also defends itself against enemies.

Microstomum has no such armament. It attacks, kills and eats *Hydra* for the sole purpose, apparently, of getting possession of the latter's stinging cells. *Hydra* cannot defend itself against *Microstomum's* attack, because the worm secretes a substance that protects it from the tiny daggers. Only when it unwittingly approaches *Hydra* is it vulnerable.

Once *Microstomum* has captured and eaten its enemy-victim, the stinging cells go through a most astonishing course. First, the white blood corpuscles of the worm, which move about in its body as freely as though they were tiny independent one-celled animals, take

charge of the cells. There are three types of these; and one of them, which is of no use to the worm, is digested and disappears.

The other two types of stinging cells, which are well adapted to *Microstomum's* defensive uses, are carried to the surface layers of the body, and there arranged into a formidable defensive armament by cooperation between the white blood cells and the fixed cells of the body.

Thus *Microstomum* is given a complete borrowed armament, which aids in repelling its enemies.

This armament, moreover, is useful not only to the worm that first captures it, but can be passed on to its offspring even to the third and fourth generations.

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PLANT PHYSIOLOGY

Plants Builds Walls With "Bricks" Made of Cellulose

Chains of Particles, Joined Together in Matrix Of Pectin, Demonstrated Through Use of Weak Acid

PLANTS build their walls in much the same manner that masons build brick walls. But plants are so skillful that when their walls are finished you cannot distinguish the bricks from the mortar. The first persons to see the bricks in plant walls and to learn the character of the mortar used in their construction, or indeed, to know that the walls were made of materials comparable to bricks and mortar, were Mrs. Wanda K. Farr of the U. S. Department of Agriculture, working at the Boyce Thompson Institute for Plant Research, Yonkers, N. Y., with Dr. Sophia H. Eckerson, a staff member of that institution.

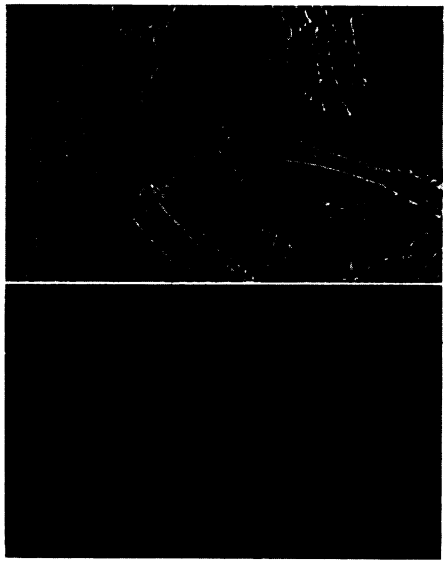
Since man first utilized fibers of the wild cotton plant, he has assumed that he was handling a uniform substance—cellulose. He has built up the huge cotton textile industry on this asumption. There are large numbers of workers throughout the world known as cellulose chemists and they have been working on this basis. True, cellulose chemists knew little enough about the stuff they worked with. They were unable to crystallize "cellulose," tell its melting point, dissolve it with any ordinary chemical solvents, give its structural formula or determine its molecular weight; but still they produced many important results. Botanists, too, have been assuming that cotton fibers were uniform and homogeneous.

At a round table discussion held at the American Institute in New York City, Mrs. Farr and Dr. Eckerson showed that in the protoplasm of the young cotton fibers as they develop there are large numbers of elliptical particles, remarkably uniform in size, separate or in bead-like strands lying approximately parallel to the long axis of the young living fiber. Separate particles and short chains are found in the central part of the cell. In the outer portions the chains are longer, and often the particles are so closely compressed end to end that they have lost their separate identity. It is in this fashion that the cellulose spiral structure comes into existence. The final step in the process consists of the close appression of the fibrils to one another and to the outer membrane of the cell.

The final thickness of the cellulose wall depends upon the extent to which this formation and deposition takes place. Another interesting fact is that from its earliest stage each of the tiny particles is enveloped in a viscous film which serves to hold the particles together with an almost irresistible force; and once the fibril is formed, the points of juncture defy the strongest microscope. It is as if a brickmason had been so skillful that in his wall it were impossible to see where the bricks left off and where the mortar began.

The film about the particles is soluble in weak acids and alkalies, and its other chemical and physical properties led the speakers to believe that the cement which holds the particles together is composed largely of pectic or jelly-forming substance, though coming as it does from the living cell protoplasm it probably has traces of many other materials. The weight of this "cement" is probably not more than two per cent. of the weight of the whole fibril.

If the process of cellulose membrane formation takes place as described, the mature membranes should break down into fibrils and the fibrils in turn into particles identical with those seen in the living cytoplasm. This was successfully accomplished by the use of strong hydrochloric acid. The cementing substance was almost instantly destroyed in this treatment and the cellulose particles fell apart.



CELLULOSE "BRICKS"

Made visible for the first time through the technique of Drs. Farr and Eckerson, are units of structure of cotton, linen, wood and manifold other useful substances. Above are cotton fibers broken down by hydrochloric acid. Below are the individual cellulose particles magnified more than 1200 times

The resulting particles were identical in size, shape, and properties with those which previously had been observed in the living protoplasm. X-ray pictures of the particles in the young cotton fiber and the particles obtained by the breakdown of the mature cotton fiber are conclusive evidence of their identity with pure cellulose. Now research workers know that cotton fibers are made up of two separate substances; cellulose particles and cementing material.

The speakers brought out the fact that they know nothing of how the protoplasm actually makes the cellulose particles but they are sure that "cellulose membranes" are not pure cellulose but particles of cellulose held together laterally and longitudinally by a pectic or jelly-like substance and that the cellulose particles can be separated from the pectic substance so that each in turn can now be studied.

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A silkworm's cocoon may unwind to a length of 600 yards.

The Euphrates River is nearly a mile wide where ancient Babylon stood.