

WHY DRINK MILK.

(From *The Canadian Nurse*, September.)

There is nothing "just as good as milk." Milk supplies some of all the material necessary for growth and also furnishes energy for work, play and warmth. It is an indispensable part of the diet of mothers who are nursing babies, and of young children. A pint and a half a day is a safe allowance of milk for an average child, while pregnant or nursing mothers, infants and many children need a quart of milk a day. Milk can furnish all the protein the body needs. A quart of milk supplies as much protein as seven ounces of sirloin steak or four large eggs. Milk supplies minerals. If the growing child does not have an abundance of minerals in his diet this deficiency may show in stunted growth, in weak bones or poor teeth. Special care must be taken to select foods rich in lime, phosphorus and iron. Our bones and teeth are made largely of lime, which is a form of calcium. One quart of milk will furnish as much calcium as ten large oranges, 32 eggs or 20 pounds of beef. Milk is also a valuable source of phosphorus and supplies some iron. The body must also be provided with certain essential substances called vitamins, if health and normal development are to be assured. All known vitamins are found in fresh milk, but one or possibly two of the vitamins may be lacking in poor, stale or heated milk. Milk needs supplementing to supply certain minerals and vitamins in sufficient quantity, and, after the early months of life, for energy and roughage. Every baby, particularly those not breast-fed, should receive daily the juice of some acid fruit as orange or tomato. In winter, when it is impossible to be out of doors in the direct sunlight for long periods, all infants, whether nursed or artificially fed, should be given Cod liver oil. Older children need, in addition to milk, fruit, vegetables, meat, fish, or eggs, bread cereal and potatoe.

SECRETS REVEALED BY NEW MICROSCOPE.

BY A SCIENTIFIC CORRESPONDENT.

(From *The Daily Chronicle*, July 17th.)

The new microscope designed by Mr. T. E. Barnard, F.R.S., is different in form and even in principle from all ordinary instruments. It looks more like a lathe or an engineer's appliance than the familiar brass and lacquer affair of conventional microscopic research workers.

It has had to be made in this way, as it was essential that it should be a perfectly rigid instrument of incredible precision. The faintest vibration or looseness of fitting would have been fatal to success.

"HEART OF THE AFFAIR."

The heart of the affair is the new combined dark ground illuminator. This has a central portion composed of quartz lenses which transmit the ultra-violet rays used for photographing the organism, and it is surrounded by an improved "dark ground" illuminator system, which allows the organisms to be seen.

There is no need to change over or readjust apparatus, and any organism faintly and imperfectly discernible to the eye by reflected light as a nebulous particle against a dark background can be photographed by transmitted ultra-violet light projected through the central portion of the newly-designed combined illuminator.

The great difficulty with the filter passing organisms has been to find a source of light whose wave-length is sufficiently short to reveal them. So far as ordinary light is concerned, these minute particles are not visible because they are shorter than the actual wave-length, and do not disturb it sufficiently for the effect to become noticeable.

MERCURY VAPOUR LAMP.

One may imagine a particle of this nature as a rock projecting from the sea. In slow, widely separated rolling waves it creates little splash or interference; but if we imagine the same rock in a choppy sea, with a series of quick little waves not widely separated breaking against it, it creates much more splash, foam and eddy, and is more noticeable.

Mr. Barnard found that the light given by the green line in the spectrum of mercury was best suited for the observation. He, therefore, uses a quartz mercury vapour lamp as a source of illumination with which to see, not the details of the organisms, but the fact of their presence. Having found them with this particular form of light, he proceeds to photograph them with another kind of light, the ultra-violet, which has a wave-length which is half that of the green mercury light, and is able to disclose shape and detail if visible under the latter.

PHOTOGRAPHING THE INVISIBLE.

The new super ultra-microscope is, therefore, specially designed so that, by focussing the visual image of the object in one light, you can, by the turn of one screw, adjust the apparatus so that it is perfect focus for light of any special wave-length.

In a word, you set it on something you can see, and then, by turning the screw to the figure for whatever light you want to photograph with, you can photograph an invisible object with an invisible light which, like X-rays, does not reveal anything to the eye, but yet affects a photographic plate.

The ultra-violet light used for photographing is, however, unable to pass through glass. Therefore all the lenses in the illuminator, in the objective, and the eyepiece of the microscope have to be made of quartz, which allows ultra-violet light to pass.

BRITISH TRIUMPH.

The whole outfit is made by English opticians, Messrs. R. and T. Beck, Ltd., and it is a successful demonstration of the superiority of British brains and workmanship over all Continental competition. The new microscope may be looked on as one of the most powerful aids to research evolved in recent years. It embodies so many special advantages, and is so novel in detail, that it may be considered almost as a new type of instrument.

It is a way with which we may hope to unlock not only some of the secrets of disease-producing organisms, but which may help us to see farther and deeper into the mysteries of cell structure and the riddles of growth and inherited characteristics. It broadens the whole possible field for research in a hundred branches of science.

[The above is a description of the new microscope which made possible the research work into the causes of cancer, recently carried out by Dr. Gye.—*Editor, N. J. of I.*]