

A great many of my patients are Christian women from our own village, for whom we have various classes of Bible instruction arranged, so that in opening the dispensary if I see non-Christians present I just have prayer and start work. Should Mahomedans or Hindus be present, I or my dispenser speak simply to them by means of the Wordless Book, a parable, miracle, or a hymn, of Christ's redemptive love for them. Then, later on in the morning, when a greater number of patients have gathered, some of my Bible-class members come from time to time and contribute their share to the evangelistic effort of the hospital. Of course, at first they need teaching the main points in an address to lay stress on, but how often have I myself been the learner too, and learned from my speakers how to present the Eastern story in its true setting. To myself the greatest opportunity for personal work comes in the nightly house-to-house visiting of the sick in their homes. When my patients are recovering, many is the heart-to-heart talk I have had with one or other of them. In this way what a grand time the small-pox epidemic gave one!

In closing, may I say to any who are thinking of taking up nursing as their profession, or, having trained, are wondering what Christ would have them do with their lives, please think of the needs of the mission field. To be able as a Christian nurse to help individual patients back to their best—body, soul, and spirit—is a very great thing, but to be a missionary nurse is the very tip-top of one's profession, as not only is the above doubly true abroad, but one is able to spell out in acts, in a language understood of all men, the great central fact of life that "God is Love."

THE STORY OF RADIUM.

BY H. A. MOUNT IN THE "SCIENTIFIC AMERICAN."

RADIUM has heretofore been a magic word, associated with the laboratory—the plaything of science. But Science's plaything of to-day is the commonplace commodity of to-morrow and already radium is the basis of a rapidly growing industry. It is perhaps the newest of all our industries and certainly one of the least understood.

So far there are only three or four companies in the whole world producing radium commercially and the product of the largest of these is about an ounce of the precious metal a year. But this is no insignificant amount, when it is considered that the total amount of pure radium in the world to-day is only about five ounces and that the market value is £120,000 a gram—and a gram is one twenty-eighth of an ounce.

There are only two practical uses so far discovered. The first is for medicinal purposes and the second is in the production of the luminous material used on watch and clock dials and as locaters for electric switches, etc. It will be a surprise to many to discover that so highly valuable a material could actually be used in the production of a two-dollar watch or a twenty-five cent locater. And it will be just as surprising to learn that it is not the radium that

glows but other substances, which become luminous in the presence of very minute quantities of radium. Already more than 4,000,000 watches and clocks alone have been treated and hardly a third of an ounce of radium has been used in the production of all of the luminous material required.

Radium has also been found to have a valuable medicinal effect in the treatment of cancer, tumor, and other malignant and many lesser diseases. To meet a rapidly growing demand from the medical profession for the substance, there has just been established, with offices in New York's financial district, the "National Radium Bank." The "bank" has been founded with an initial deposit of £375,000 worth of radium—a mere pinch—and it is the plan to loan this for medical use, just as though it were money. Satisfactory security will be required and interest will be charged on the value of the radium borrowed. The "capital" will be increased as the necessity appears.

So far as is known, no radium is being produced in commercial quantity outside of this country at present. This is largely because all of the known radium deposits are in our western deserts and such foreign companies as were receiving ore had their supply cut off by the war. Nearly all of our radium deposits are in almost inaccessible spots, but the deposits are near the surface and are easily mined. Location of the mines, however, is very expensive.

The largest of the domestic producers has its mines in the picturesque Long Park plateau in Paradox Valley, Colorado. The ore is hauled to the railroad, a distance of fifty-eight miles, by six-horse wagons over land even too rough for the use of light motor trucks. From here the ore is carried 2,600 miles by rail to a plant in Orange, N. J. Almost enough chemicals to equal the weight of the ore are required in the reduction process and it is for this reason that the ore is not reduced at the mines, together with the fact that the necessary labour cannot be obtained there.

The reduction process is a very complicated one of chemical separation and elimination. It differs from other ordinary chemical processes only in the refinement of control necessary. Electrosopes capable of detecting the presence of such minute quantities as four one-billionths of a gram of radium, are used to check the content of the material after each operation. After passing through scores of vats, strainers, compressors, evaporators, and the like, about eight carloads of ore have been reduced to less than a thimbleful of radium. This represents about four-fifths of all the radium in the ore. One-fifth has been lost in refining, considerable quantities of uranium and vanadium are a by-product of the process.

In making the luminous material used on watches, zinc sulfide or crystallized zinc is used as a base. It has been found that zinc crystals glow under the influence of radium. Experiments along this line were conducted in Europe as early as 1910. This glow is caused chiefly by the bombardment of minute particles to which the zinc is subjected in the presence of radium. It is necessary to have the zinc sulfide of great purity and for this reason it also is manufactured in the company's plant under careful chemical control.

The amount of radium required has been determined by a long series of experiments. The more radium used, the brighter the glow, but the quicker the deterioration. But it has been found, the luminosity is not in exact proportion to the amount of radium used and a quantity has been determined which gives the greatest luminosity and the longest life for the least money.

The commercial material now available is guaranteed for the life of the instrument on which it is used. It is supplied to the manufacturer as a yellow powder. It is mixed with an adhesive and applied to the work at hand with the tip of a camel's hair brush. Care is taken not to brush the material but to place it on the surface drop by drop, so as not to crush the zinc crystals. It is interesting to note that the deterioration of the substance is not due to failure of the radium, but to a breakdown of the zinc crystals, due to the bombardment of radium particles. No known substance will stand up under this bombardment.

New uses are constantly being discovered for this material. A company is now in formation for the manufacture of luminous house numbers in large quantities. The best known use is in the luminizing of clock and watch dials and as locaters for electric switches. Some of the later applications are its use as keyhole locaters, on airplane and automobile instruments, ships, compasses and telegraph dials, mine signs, steam gages, pistol sights, poison bottle indicators, bedroom slipper buttons, furniture locater buttons, theater seat numbers, automobile steering-wheel locks, etc. Two recent novel applications are in the manufacture of luminous fish bait and glowing eyes for toy dolls and animals.

THE TEETH.

BY EUREKA.

AS a rule we never appreciate a thing until we have lost it, and so it is with our teeth. What struck me so forcibly in many large towns I have visited were the number of brass plates announcing that so and so is a dentist. In any out-patient department if 50 of the patients were asked to open their mouths, how many would have their full complement of teeth? How many would have their teeth free from caries? I think the number could easily be guessed at, and yet the chief cause of bad teeth and consequent bad health, is want of cleanliness.

Teeth should be cleaned at least morning and evening and if possible, after every meal.

Man, like most mammals, possesses during his life time two sets of teeth. The first set appear in infancy and are called the temporary or milk teeth. They number ten in each jaw. The milk teeth appear at varying periods after birth and by two years of age are all present. During the period of dentition the child suffers considerably in health, particularly if of a delicate constitution. Children suffer frequently from diarrhoea at this time, and treatment should be directed to the teeth: doses of lime water are of use, as the teeth need lime. The milk teeth shed in the course of years and are