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sunshine there each day for three years, recorded by the month, ranged from 1.9 for December, the lowest figure, to 9.5 in July, the highest. The average percentage of maximum sunshine from 11 a. m. to 1 p. m. —the period during which infants can be most conveniently exposed—showed a similar increase from December to July. The sun's rays during December, January and February in the latitude of Toronto produce a slight but definite antirachitic effect on rats fed on a rachitogenic diet. A sharp increase occurs in the antirachitic effect of sunshine about the first of March. The antirachitic effect of sunshine in April and May is approximately eight times as great as in December, January and February. It would appear that the increase in the antirachitic effect of sunshine in March, April and May is due not so much to an increase in the amount of the ultraviolet rays of the length present in the sunshine in winter as to the presence of rays that are shorter than those found during the winter. The antirachitic effect of skyshine (reflected rays from the sky and clouds) is approximately from one half to two thirds as great as that produced by what is ordinarily termed sunshine (rays from the sun plus the reflected rays from the sky).[4]

Ordinary window glass is impervious to the antirachitic rays of sunshine. Consequently much effort has been devoted of late by glass manufacturers to the production of glasses that will transmit some of the rays in the region of the ultraviolet. Reports on some of the available products have already been published in THE JOURNAL.[5] Those now marketed are only partly pervious. The studies of Tisdall and Brown[6] on rachitic animals show anew that no antirachitic effect, or at the most a negligible effect, is produced by the sun's rays through ordinary glass. The antirachitic effect of skyshine through the special glasses is slight—in fact, almost negligible—except immediately adjacent to the window. Similar results were obtained with rays through an open window covered with ordinary fly screen. In order to obtain much benefit from rays through an open window or a window glazed with special glass it is necessary to receive the direct rays of the sun. Tisdall and Brown believe that the use of special glass during the winter months is probably of little value. Its use in the latitude of Toronto is justified from about the first of March on, as the inclement spring weather prohibits the exposure of patients to the sun's rays, which at that time have a great antirachitic effect. By means of this glass, these antirachitic rays can be utilized.

4. Tisdall, F. F., and Brown, Alan: Antirachitic Effect of Skyshine, Am. J. Dis. Child. 34: 737 (Nov.) 1927.
5. Report on Window Glass Substitutes, J. A. M. A. 88: 1563 (May 14) 1927. Sheard, Charles: Ultraviolet Radiation and Its Transmission by Various Substances, ibid. 88: 1315 (April 23) 1927. Bundesen, H. N.; Lemon, H. B.; Falk, I. S., and Coade, E. N.: Ultraviolet Radiation from Sunlight and Incandescent Lamps, ibid. 89: 187 (July 16) 1927.
6. Tisdall, F. F., and Brown, Alan: Antirachitic Value of the Sun's Rays Through Various Special Window Glasses, Am. J. Dis. Child. 34: 742 (Nov.) 1927.

PULMONARY ASBESTOSIS

Apparently the first case of pulmonary asbestosis reported was in 1924. W. E. Cooke[1] has just made available the record of a woman who began to cough soon after she started work in an asbestos factory at the age of 13 years. Her general health did not suffer until she was 26. Five years later she was totally incapacitated and she died at 33. Her complaints had been cough, dyspnea, expectoration and lassitude, and the physical signs those of fibrosis and cavitation of the lungs. Postmortem examination of the patient's lungs[2] revealed diffuse interstitial pneumonia, chronic bronchitis, some empyema, anthracosis and extensive tuberculosis. Certain foreign bodies were unique. They were found in the alveoli, bronchi, bronchioles and interstitial fibrotic areas and apparently were neither of vegetable nor of animal origin. The hypothesis advanced is that these bodies are portions of asbestos fibers in the process of alteration and absorption by hydrolysis, either by direct chemical action or by enzymes. The question remains as to whether the fibrosis was the result more of tuberculous infection or of the presence of asbestos. Considerable fibrosis, however, has been found in one case without apparent tuberculosis.

Industrial dusts have been the objects of widespread research. In view of the fact that asbestos has been in use since five centuries or more before the time of Christ, it seems strange that it has not attracted attention. Asbestos is a silicate and is associated with other substances in the proportions given by Cooke as follows:

	Italian Fiber	Canadian Chrysotile
Silica	40.30	40.87
Magnesia	43.37	41.50
Ferrous oxide	0.87	2.81
Alumina	2.27	0.90
Water	13.72	13.55

Microscopically, asbestos consists of translucent glistening fibers, on the one hand; opaque angular particles and minute black granules, on the other. In the process of manufacture, much dust is generated, particularly in carding, and this dust is made up of the angular particles and black granules mentioned. Few of them appear in the finished product. Analysis shows:

	Per Cent
Finished article: Iron (as ferrous oxide)	0.1
Crude raw material: Iron (as ferrous oxide)	2.81
Dust from carding room: Iron (as ferrous oxide)	18.4

"From these results it appears conclusive that the blackened brittle parts of the asbestos fiber are the iron-containing portions—the bugbear of the manufacturer, the cause of 'dust' and a danger to the health of workers in the process of manufacture."

Although Cooke's case is only the second reported, many other cases seem to have occurred. One patient, for instance, who had worked in a carding room for ten years before his admission to a hospital said that

1. Cooke, W. E.: Pulmonary Asbestosis, Brit. M. J. 2: 1024 (Dec. 3) 1927.
2. McDonald, Stuart: Histology of Pulmonary Asbestosis, Brit. M. J. 2: 1025 (Dec. 3) 1927.

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he was the only survivor of ten men who had started work with him. Conditions are better now, for modern factories are equipped with devices for removing the dust. Nevertheless, asbestosis, because of its dangers and its unique pathologic features, deserves more attention than it has had.

FOREIGN OBJECTS IN THE CIRCULATION

The protective devices at the command of the body are remarkable and varied. They help to avert disaster and sometimes death under conditions that would tax the resources of the most ingenious physician to the utmost if his assistance alone were depended on to devise relief. Some of the mechanisms on which the organism depends involve chemical reactions. Thus, acids and alkalis tend to become neutralized and consequently less harmful. Toxic organic products, whether introduced from without or produced endogenously, may be oxidized, conjugated or otherwise altered chemically so that the resulting compounds are more readily tolerated and eliminated. Some substances, like certain of the heavy elements, may become innocuous through deposition in tissues. The outcome in all these typical instances tends to result in diverting danger.

There are other protective reactions that depend almost entirely on mechanical effects. This applies to the disposal of foreign materials, particularly such as are chemically inert and insoluble in the body fluids. Metallic pieces somehow manage for the most part to traverse the alimentary canal without serious injury to it. The swallowed open safety pin has given many a mother well justified worries until it emerged without detriment to the unsuspecting infant that ingested it. Accidents occasionally introduce metallic particles not only into the soft tissues but even into the blood stream. More than one bullet or projectile fragment has entered a large vein and gradually proceeded along the path of the vessels. Where does it go?

A review of the literature by Warthen [1] has left him with the impression that wandering foreign bodies in the venous circulation are carried by the blood stream to the heart, where they are kept in motion by the churning action of the heart or become entangled in the chordae tendineae of the right ventricle and gradually embedded in the endocardium. No mention is made of foreign bodies reaching the lungs. In his own studies at St. Elizabeth's Hospital, Richmond, Va., to determine the course taken by foreign bodies in the venous circulation and their ultimate lodging place, objects of various sizes and shapes were inserted in the veins of a series of animals. These investigations showed clearly that the foreign objects within the lumen of a normal vein of a dog are carried by the blood stream toward the heart. This migration may take hours or days, but eventually these wandering bodies reach the heart. It was surprising to learn further, however, that the majority of these objects do not remain in the heart but are pumped into the pulmonary artery and lodge in the lungs, where they produce infarcts with apparently little disturbance to the pulmonary circulation. The presence of these foreign bodies within the lungs appears to cause little discomfort. Abscess of the lungs rarely occurred. Apparently sterilized foreign objects in the venous circulation do little harm to the heart or lungs, and unsterilized objects which are smooth and symmetrical rarely cause infection. Unsterilized, irregularly shaped bodies, as nails or fragments of nails, are most dangerous and give rise to abscesses.

It will come as a surprise to learn from Warthen that it is possible for objects to pass from the venous to the arterial circulation, this transition probably occurring in the lungs, without leaving any macroscopic evidence of pulmonary injury. He notes, as others have observed, that the smaller, more symmetrical and lighter objects in the venous circulation tend to remain in the heart, while the larger, more irregular and heavier bodies are carried into the lungs. Foreign bodies that remain in the heart appear to lodge near the apex of the right ventricle at the base of the chordae tendineae. As this is the most accessible region of the heart in man, the newly developed possibilities of intracardiac surgery may be requisitioned whenever foreign objects thus lodged demand removal.

1. Warthen, H. J.: Fate of Foreign Bodies in Venous Circulation, Arch. Surg. 15:712 (Nov.) 1927.

Current Comment

THE DANGERS OF ULTRAVIOLET RAYS

The tendency of therapeutic methods to be adopted and discarded in great waves of popularity and forgetfulness has never been so completely manifested as in the current attention given to the use of physical therapeutic methods, particularly the ultraviolet ray. Not only do barber shops swindle prospective victims of baldness with incandescent lamps colored purple, not only do electrical corporations sell, as ultraviolet ray devices, contraptions delivering hardly any ultraviolet radiation at all, but some manufacturers of apparatus actually delivering ultraviolet rays of potency endeavor to place these devices wherever a sale can possibly be made. Regardless of the fact that practically every method in medicine that may do good can also do harm, these machines are being sold to bath institutes, swimming pools, massage parlors, beauty parlors, clubs, barber shops and innumerable other businesses in which medical supervision is certainly not probable, indeed, hardly possible. The sales are made notwithstanding the fact that scientific literature has already revealed that the rays may in some instances depigmentize or bleach the skin, that they possess dangerous effects for the eyes, that some people who do not tan