



ARTIFICIAL DAYLIGHT FROM VACUUM TUBES

MR. D. McFARLAND MOORE, the inventor of the form of vacuum-tube lighting most commonly seen, has a fine contempt for electric bulb and arc lights. They are "simply refinements of the torch of the primeval savage, or the common candle," he said in an address before the Franklin Institute, in Philadelphia, on September 21. Their light depends upon the heating of minute particles to the glowing-point, so the amount of light depends upon the amount of heat, and even so, "their scale of color and brightness is limited."

"Moreover, they are far from economical and transform into light, even in their most improved form to-day, only a very small percentage of the energy contained in the coal that is put under the boiler. They may therefore justly be described as primitive and inefficient even in their present highly developed form."

A "more advanced principle" has been discovered, however, Mr. Moore goes on to say, the principle of "selective luminescence," by which metals are found whose particles have a higher rate of vibration than those of the carbon of the arc-light and incandescent bulb, and "it has, in fact, been found possible to set up by heat extremely high vibrations in a combination of the metals thorium and cerium." As quoted in *The Electrical Review and Western Electrician* (Chicago, October 8) he proceeds:

"The Welsbach gas mantle is the practical application of this discovery in the field of what is known as selective luminescence. One of the best examples of selective luminescence produced chemically is the firefly. It is upon the possibility of electrically setting up vibrations in gases that the vacuum-tube light is based, and the Moore tube light of to-day in its various forms is the practical application of this theory.

"In its present form the light furnishes soft but penetrating illumination in absolutely practical and economical form either in long tubes or in tubes arranged in compact or portable form as 'windows.' Various colors are possible. The most economically produced is a yellow, from nitrogen. Air alone gives a pleasing rosy glow. Perhaps, all things considered, the most valuable is that obtained by the use of carbonic-acid gas, which gives a light that reproduces average daylight. This is of great commercial value in all trades that are in any way dependent upon color, such as dyeing-establishments, printing-shops, weaving- and spinning-mills,

and especially in haberdashery and department stores, where it shows goods in their right colors and enables accurate matching to be done, regardless of daylight, during the entire twenty-four hours of the day if necessary. Color-matching and selecting usually deals with the very finest and most refined shades and tints and hence the immense value of an artificial daylight can easily be understood."

The new light, according to Mr. Moore, is being used by dyeing concerns for testing and comparing colors; by lithographers who are able to do accurate color-printing by its aid; by jewelers, to grade and match gems; by oil refiners, so that the color of the oil flowing from their stills may be accurately judged, and by photographers, who use it for soft daylight effects in night work. We read further:

"Florists are using it so that their flowers may be seen in the same colors they have under the blue sky. Art galleries are using it so that the pictures they have to sell shall be seen in all the vigor or delicacy the painter, who made them under daylight, meant that they should have. The air and nitrogen tubes are used in many stores and give the best distributed and most shadow-free illumination to be had and the illumination easiest on the eyes. The largest equipment of this kind is in the New York City Post-Office, where nearly a mile of tubing has been used for several years to light an entire floor."



D. McFARLAND MOORE,

Who declares that our electric bulb and arc lights are "simply refinements of the torch of the primeval savage."

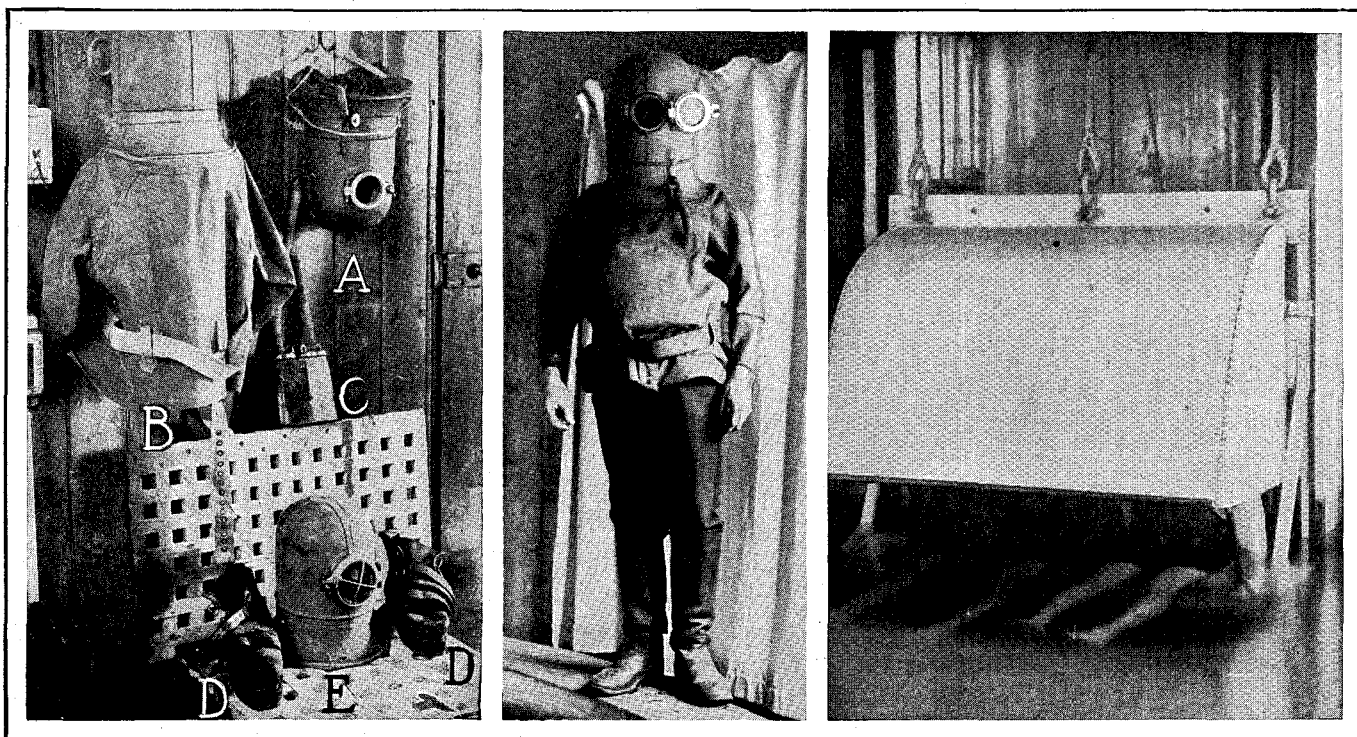
MYSTERY OF "INFANTILE" PARALYSIS

THE CARELESS reader would think that the past decade had been characterized by the development of an unusually large number of mysterious diseases. The fact is, however, that the modern physician is not content until he knows far more about the cause and progress of a disease than satisfied the medical man of his father's time. Hence our "mysteries," of which the latest would appear to be the malady whose name heads this article. Newspaper accounts characterize it as a sudden paralysis with little or no warning, attacking generally the young, but often adults also. The medical authorities say that the paralysis is but a phase—due to the penetration of the disease to certain brain- or nerve-centers. One may have the disease without it, and it may appear in different forms, according to the center affected. Hence physicians have been considering it not as one, but as several different diseases, with corresponding confusion in diagnosis and treatment. The



MATCHING COLORS BY "ARTIFICIAL DAYLIGHT."

Vacuum-tube illumination in the largest silk-dyeing works in the world.



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THE LIFE-PRESERVER FOR SUBMARINES.

A, the helmet, with the purifier folded inside; B, helmet and jacket unpacked; C, the purifier carrying the charge of oxylithe; D, D, lead-soled shoes; E, a shallow-water diving helmet, with purifier folded inside.

AS A SMOKE-HELMET.

The chemicals in the purifier destroy the deadly chlorin gas of the submarine, should any enter.

LOWERING THE AIR-LOCK.

The device with which all future submarines in the British Navy will be equipped, and through which, in case of accident, the men equipped with the helmet can leave the submarine and make their way to safety.

TO ROB THE SUBMARINE OF ITS TERRORS.

matter is not yet quite cleared up. In an editorial on the subject, *The Medical Record* (New York, October 8) points out that the diseased spinal cord characteristic of one form is but the sequel of an acute inflammation which is in itself but a part, and in fact not a necessary part, of a general constitutional infection or intoxication. We read:

"Not only has it been pointed out on many occasions that during epidemics of typical poliomyelitis, cases occur showing constitutional symptoms which lead the observer to expect at any moment the appearance of the tell-tale paralysis, but are aborted so that the little patient after a few days' illness is again returned to robust health, but it has also been shown . . . that in such epidemics similar cases occur, but with the striking difference that the paralysis resulting is of a cerebral rather than a spinal type. . . ."

"In *The Practitioner* (July, 1910) Reginald Miller, of London, briefly and ably reviews the present knowledge of this disease. Its occurrence in epidemics of poliomyelitis, in the hot season, and in children between six months and six years of age, and the complete similarity of the symptoms of onset to those of poliomyelitis leave but little doubt that in the two symptom complexes we are dealing with different manifestations of one and the same disease. Miller, in fact, groups all of these allied conditions as one infection with four clinical forms [including] . . . the abortive form causing no paralysis."

When the brain is the seat of the disease, the writer goes on to say, the symptoms may be "as varied as are the innumerable functions of the different portions of the brain tissue," including mental degenerations, affections of the muscles of the eye, or of the facial or the auditory nerve, sudden onsets of ataxia, acute tremor, etc. From the study of all these varied conditions it is evident, the writer says, that they belong to one great disease. He concludes:

"The use of two different names for two manifestations of one disease is unfortunate and confusing. A new term is desired, and when it is obtained, it must be some comprehensive word containing a specific reference to neither the spinal cord nor the brain, which will enable the grouping of all of these clinical complexities as one great disease."

TO TEACH MEN NOT TO DROWN

HAD THE scores of men who have died like rats drowned in a trap, imprisoned in disabled submarines, been through the course of training now provided in the British Navy, and had they possessed the simple life-saving apparatus now used there, they might all have been alive to-day. This apparatus robs submarine service of its terrors, but lest the drowning men in a sunken boat should lose their nerve and not be able to use the apparatus properly, classes have been instituted to teach the crews of submarines in the Royal Navy how not to drown. Says a writer in *Harper's Weekly*:

"Of all the duties that fall to the enlisted sailor's lot none calls for stancher qualities of courage and self-possession than the manning of the submarine. During the present year Japan and France have each lost a vessel through accident; less recently France has lost two besides, England two, and Russia one, and in each instance the crews, trapt and helpless, have slowly died from the exhaustion of the air or have been poisoned by chlorin gases within their tombs of steel."

"To avoid a recurrence of such loss of life in cases of similar disasters, England will fit to every submarine that she builds in future air-traps—into which the men can go for momentary breathing-time, while they put on their helmets—and air-locks, through which to leave the submarine. The men will be provided with special life-saving dresses and helmets. The helmet contains an oxylithe chamber, providing a supply of air for the period of an hour and a half, and has a glass window. It is so buoyant that it will support the wearer and another man upon the top of the waves. The dress is fitted with a chamber which can be inflated when the wearer comes to the top, and, after closing the valve, the man can open the front window and breathe the air for an indefinite time, until rescued by some passing vessel."

"There is a twelve-pound weight attached to the dress, which enables the wearer to keep down while traveling from the air-lock to the place of escape. Then, if he has not enough buoyancy to start from the bottom, he slips the weight. This gives him extra buoyancy and takes him to the surface. If, on the other hand, he has enough buoyancy, he keeps his