THE MAREORAMA.

One of the attractions of the Paris Exposition of 1900 will be M. Hugo d'Alesi's "Mareorama," the principal feature of which will consist of a large ocean steamer, the passengers upon which will have an opportunity of making a voyage from Marseilles to Constantinople; that is to say, an imaginary voyage, since the vessel will not move forward at all, the illusion of sailing being produced by an arrangement that has already been employed upon the spectacular stage. The vessel will be mounted upon a spherical pivot, and the only motions that it will have will be those of pitching and rolling, which will be given it through the maneuvering of four pistons. It will be surrounded with genuine boiling and foaming water; and in the ventilators will be placed seawrack and algæ, traversed by a current of air that will become impregnated with marine odors.

The spectators, or the passengers rather, will walk about at their pleasure or sit at ease in rocking chairs upon the deck, which will reproduce that of a genuine steamer with the minutest accuracy, with all the details of masts, rigging, smoking and vibrating funnel, and a crew executing various maneuvers at the command of an experienced captain. At the same time, to the starboard and port of the vessel will unroll canvases fifty feet in height, painted with all the perfection that might be expected from the brush of M. d'Alesi, and representing the port of Marseilles flying to the rear, Frioul, Chateau d'If and fishermen's boats, and then the high seas and the Algerian and Tunisian coasts toward which the vessel will be apparently steering. Over half a mile of canvas will unfold all the sites and episodes of this picturesque voyage. Everyone is acquainted with the phenomenon; the displacement of an object which occupies the entire field of vision gives the stationary spectator the impression that he himself is moving. Thus, when we sit in a motionless train and another train rushes past us, it seems to us that it is our own train that is beginning to move.

"My Mareorama," says M. d'Alesi, "is based upon an analogous illusion. I shall keep up this simulation of a voyage by sea by every means possible. It is my intention to change my canvases after the Exposition is over, and we shall then, perhaps, make a trip to the North Pole."

The Palace of the Mareorama, constructed after the plans of M. Lacau, will be situated on the Champs de Mars, between the Eiffel Tower and the Monlineaux Station. It will be 131 feet in length, 112 feet in width, and 75 feet in height. An immense terrace, covering the entire structure and converted into a hanging garden, will crown the palace. This terrace will be reached through two wide stairways and two large elevators.

For the above particulars and the illustration we are indebted to the Revue International des Expositions de 1900.

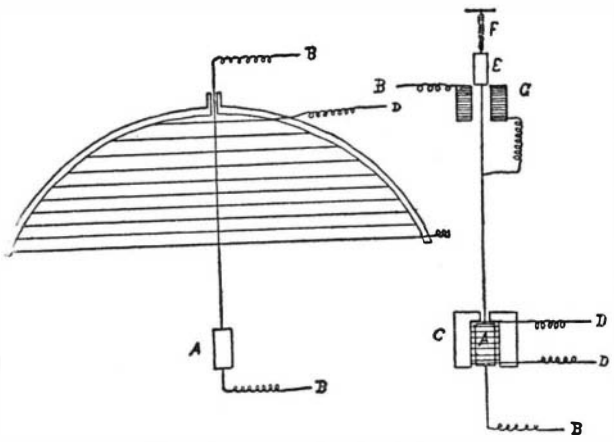
A Children's Museum.

Brooklyn is to have a children's museum similar to those which have been established in St. Petersburg, Vienna, Berlin, Paris, and other European cities. The new Brooklyn Museum will be the first of its kind in this country. The suggestion emanates from Prof. W. H. Goodyear, the Curator of Fine Arts of the Brooklyn Museum, and the trustees of the Institute decided to equip the Bedford Park Museum for children. It will contain specimens and pictures illustrative of art and science. It will be rich in educational material relating to all departments of knowledge, and designed for children's use. Prof. Goodyear has suggested that the basis of the collection, or rather the initial purchase, should be the Musée Scolaire, published in Paris, which consists of over one hundred colored cartoons, each cartoon displaying a combination of specimens wired to the pasteboard, colored designs and text. In this way the making of such substances as glass, paper, cloth, bronze, etc., is illustrated, each cartoon of the series having the materials, processes, and stages of manufacture shown by natural specimens and colored pictures. This was practically what was done a few years ago in the technical museum of the Pratt Institute. Unfortunately, the collection in that museum, which was excellent, had been dispersed, most of the specimens being sent to other departments in the Institute, where, of course, the main idea of the technical museum is entirely lost sight of, so it will be gratifying if Brooklyn will, at last, have a technical museum.

Specimens illustrating zoology, botany, geology, etc., will be added to the new children's museum, and the result will be a complete museum of material for object teaching, the value of which lies in its systematic balance and comprehensive character. If there is a strict regulation prohibiting the acquisition or exhibition of isolated specimens and of incomplete and mixed collections, the result cannot fail to be most gratifying. The collection will be carefully labeled, so that catalogues will be unnecessary, and a competent person will be in charge to explain and help the young visitors. The building is to be repaired and put in order at once for the reception of exhibits, and it will probably be several months before it will be ready for exhibition. The new museum will also serve as a model for schoolroom decoration.

THE NERNST LIGHT.

The Nernst electric light is creating great interest abroad, and the paper of James Swinburne before the Society of Arts, of London, ends with the following sentences: "I feel that I have but feebly shown forth the probable future of what seems to me to be the greatest invention in electric lighting that we have seen for many years. Still, I am sure that I have not been too sanguine." We have already referred to this lamp, and in the current SUPPLEMENT we publish Mr. Swinburne's original paper, as presented before the Society.

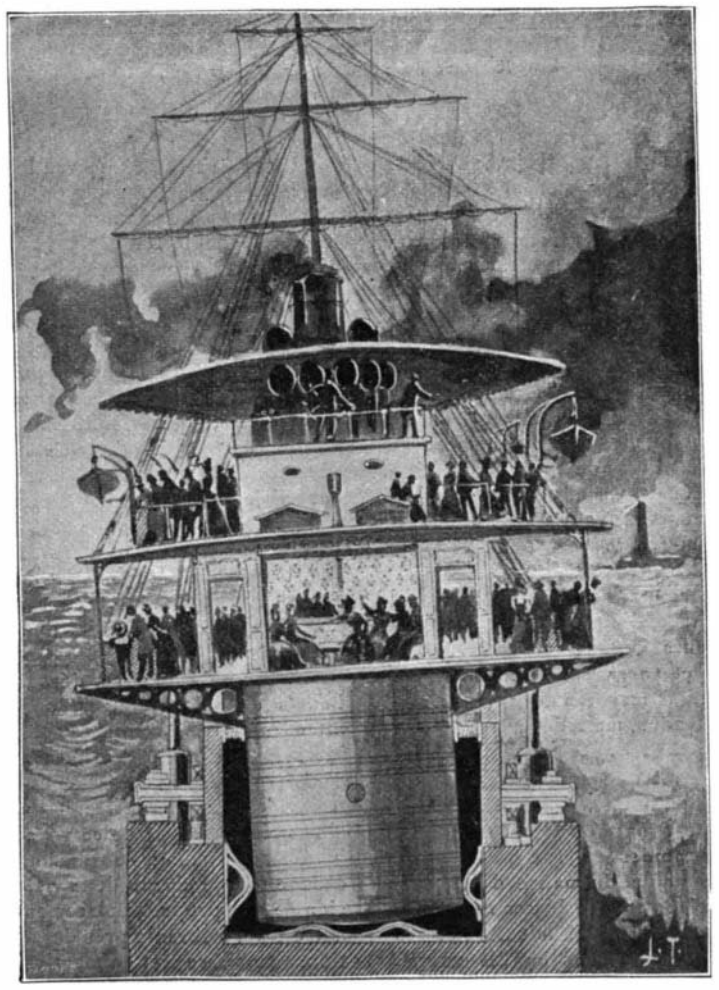


PROF. NERNST'S APPARATUS.

Prof. Nernst has achieved a wonderful result by the very simple means of rendering an insulator a conductor by heating it. The knowledge that an insulator could be made to conduct electricity by heating it was known some twenty-three years ago, but apparently no one thought of the simple expedient of heating a very good insulator, then applying a current of suitable potential, and thus obtaining a brilliant light. The result is clearly of great commercial importance, aside from its being interesting from the purely scientific side.

The Nernst light appears to have very practical advantages. It can be made to run singly on a pressure of from 500 to 1,000 volts, and any lamp which can be worked with voltages higher than those possible with the present glow lamp must bring about great economy in electric supply. It does not require a thin glass bell and a vacuum, and thus we get rid of a very serious difficulty, because these bulbs are very fragile and are easily destroyed. In the ordinary incandescent lamp many of them are defective, owing, not to a fault in the filament, but to an imperfect vacuum. Of course, a lamp of the Nernst type would not need regulating machinery and no trimming would be necessary, and on this account it would appear that an ideal form of street lighting has, at last, been found. The possibilities of the carbon filament are about exhausted. There has been little improvement for a long time, and it is a remarkable thing that just when the carbon filament was failing to meet the requirements this new invention should be made, which seems to meet the case. It is very like the discovery of gutta percha at the critical period, which brought electrical cable makers out of their difficulties. As yet the Nernst lamp is in an experimental stage, and it is possible that in time some of the features which militate against its success will be modified. At present the conducting and light-emitting rod when cold is an insulator and must be heated with a match or by some electrical means. While the Nernst lamp is far from being a commercial success as yet, still it is also far from being only the impractical scheme of an inventor. The lamp is based upon sound scientific principles which appeal at once to practical electricians, who have been extraordinarily quick in this instance to see the wonderful potentialities of the lamp.

The operation of Prof. Nernst's apparatus is as follows: The preliminary heating of the magnesia, *A*, the professor accomplishes by placing it in the focus of a reflector, *C*, see left figure. On the inner side of the reflector is a spiral wire of platinum, *D*, which when brought to incandescence by a current produces heat sufficient to render the magnesia a conductor; a current is then passed directly through the oxide by the wire, *B*, and that in the spiral is shut off. A complicated form of lamp is seen in right figure. Here the magnesia, *A*, is placed within a cylinder, *C*, which also incloses a platinum spiral, *D*. As soon as the incandescent spiral has heated the magnesia sufficiently, a current is passed through the oxide by the wire, *B*. Within this circuit is a coil, *G*, which, upon becoming magnetic, draws down the iron bar, *E*, thus lowering the now incandescent magnesia from within the cylinder. Upon breaking the circuit the coil loses its magnetism, and a spring, *F*, raises the iron bar and the magnesia to their former position.



THE MAREORAMA.

San Pedro Breakwater.

Work on the great San Pedro breakwater, which is to inclose a harbor of refuge on the lower coast of California, has begun. An appropriation of $2,900,000, of which $400,000 is available for each year, has been made by the government, and now this colossal undertaking will be pushed to completion. The plan adopted by the government contemplates a detached breakwater 8,500 feet in length, with two arms of 3,000 and 3,700 feet, connected with a curve of 1,910 feet radius, 1,800 feet long. The shore end begins 2,100 feet from land, in 3½ fathoms, gradually deepening to 8½ fathoms at the west extremity. The breakwater will consist of a random stone substructure surmounted by a structure of more regularly shaped rock roughly placed, carried to a height of 14 feet above mean low water. The superstructure is to be protected at both ends by a block of concrete 40 feet square, carried 20 feet above mean low water. The substructure rests on a base 90 feet wide, and finished 38 feet wide at mean low water, and will have a slope of 1 to 2 horizontal to 1 vertical, the whole height inside. For the 12 feet above the plane of rest on the ocean side the slope is 3 horizontal to 1 vertical. The breakwater will be 20 feet wide at the top. The estimated quantity of material that will be consumed in this structure is 1,781,998 cubic yards of rock of all kinds and 64,000 cubic feet of concrete.

The rock will be obtained on San Clemente Island, 52 miles distant, where the contractors have already driven four tunnels from 50 to 30 feet in length, and built a protective breakwater allowing the barges to be loaded right at the face of the rock. A very large amount of machinery for derricks and other appliances has already been placed upon the island, and men are now at work getting out rock. Air compressors and drills have been ordered, and will soon be on the ground. About 3,000,000 feet of lumber will be required for building barges. Seventy-five men are employed now, but later this force will be much increased. Progress will be rapid as soon as the shipments of stone begin, as the sea at this part of the coast is rarely visited by severe storms. Work can be prosecuted throughout the year.

The new breakwater will afford the only safe and capacious harbor, with the exception of San Diego, between San Francisco and Mazatlan. E. BROWN.

San Francisco.

MR. G. A. SPOTTISWOODE died in London on February 8, 1899. He was the head of the great publishing house of Spottiswoode & Company, and was well known in religious and philanthropic circles.

Science Notes.

A writer in The Cincinnati Lancet claimed that he recently helped hold an autopsy on an old soldier who had been wounded in 1861, by irregular soldiers known generally as "bushwhackers." The wound was made by a small rifle ball of the kind used by muzzle-loading rifles. It had embedded itself in the wall of the heart, near the lower part of the left ventricle. There had not been any depression of the heart in any way, and it seemed to be perfectly normal. After the war the man served as a farm laborer for thirty-seven years. A cancer of the arm was the cause of his death.

A new process for coating iron and steel consists in the use of a bath consisting of zinc, tin, and aluminum. It is claimed that this produces a coating which is much superior to any now known, adhering so firmly that the sheet will stand working after it has been applied and will resist corrosion and can even be heated red hot without injuring it. The coating is applied in the same manner as in the well-known process of galvanizing, that is, by dipping galvanized sheets in the metal alloy. The most approved mixture is made by melting together 84 parts of zinc, 14 parts of tin, and 1½ parts of lead and 0·5 of a part of aluminum. The process is patented.

An International Veterinary Congress will be held at Baden, August 9–14, 1899. The subjects to be discussed include prophylactic measures to prevent the spread of cattle diseases by the export of animals; the treatment of tuberculosis in domestic animals; the use of the flesh and milk of animals affected by tuberculosis and requirements for the inspection of meat; the cure of foot and mouth diseases and diseases of swine; the dissemination of veterinary instruction, as well as the preparation of a uniform anatomical nomenclature in veterinary medicine and the cure of rabies, etc. The members of the congress will consist of delegates from foreign countries, as well as from the German empire, representatives of veterinary schools, public health officers, etc.

A curious case of the recovery of a woman who had been disemboweled by a cow is noted in The London Lancet. The woman, who was forty-two years of age, was tossed into the air, and it was found she was suffering with a severe abdominal wound through which twenty feet of small bowels protruded. The physicians washed the wound with a weak solution of carbolic acid, and the reduction was begun. Catgut sutures were introduced deeply, but not touching the peritoneum. It was thought at first that the patient would not survive the reduction, the shock having been so severe; but, fortunately, no hemorrhage or injury of the bowels had occurred, and when the reduction was complete and the wound had been sewed up, the woman expressed herself as feeling better. The after history of the case was most satisfactory, and in thirty-five days after the accident she was up, moving around doing light work.

The various departments of the city government of New York that have engineering work to do employ no less than one hundred and seventy-two civil engineers, at salaries which range all the way from $1,200 to $10,000 per annum. To assist these engineers a host of draughtsmen, surveyors, etc., are employed. The Commissioner of Sewers has a chief engineer and twenty-six assistant engineers; the Commissioner of Bridges has fifteen engineers; the Commissioner of Water Supply has twenty-seven engineers; the Commissioner of Public Buildings, Lighting and Supplies, has three engineers; the Dock Department, twelve; the Park Department has eleven engineers; the Board of Education, two; the Board of Public Improvements, twenty-five; the Commissioner of Highways, twenty-three engineers; Commissioners of Accounts, six engineers; Finance Department, six; the Chief Engineer of the Croton Aqueduct has fourteen assistant engineers under his orders. This is certainly a remarkable showing of professional talent for even a city of the size of New York.

An association called the "Cuban Educational Association of the United States of America" has been formed, with offices at 289 Fourth Avenue, New York city, N. Y. The object of the society is to assist in educating the Cubans and Porto Ricans in the United States. A large number of applicants from Cuba and Porto Rico have asked to be educated in the United States; but many of them are, unfortunately, deficient in the English language, and, besides, have not sufficient funds to enable them to obtain a course in the United States. A large number of educational institutions in this country have offered to receive and instruct these young men, without charge, so that only necessary living expenses have to be provided. To meet the emergency the association suggests that in each city and town which has an institution willing to receive one or two of these bright young men, there should be formed a committee who will stand sponsors for the board and incidental expenses for each young man, for one year of trial work at school. This is certainly a very interesting plan, and it is indorsed by such men as Major-Gen. Wheeler and Prof. Nicholas Murray Butler, of Columbia University.

Miscellaneous Notes and Receipts.

Waterproof Glue.—Besides with potassium chromate, glue may also be rendered impervious to water by admixture of linseed oil. The glue is first soaked in warm water and then melted at a moderate temperature in linseed oil, or else a liter of glue solution is simply mixed with 100 c. m. of linseed oil. In the latter case a slight addition of nitric acid is recommended to keep the mixture liquid. A little borax will protect the glue from putrefying.—Oesterreichisches Lederblatt.

To extinguish oils which have taken fire, the Illustrirte Gewerbe Zeitung recommends the use of a fine-meshed wire-net of the size of a boiling-pan, which should be kept on hand in every varnish factory, etc. In the same moment when the netting is laid upon the burning surface, the flame is extinguished because it is a glowing mass of gas, which the iron wire quickly cools off so much that it cannot glow any more. The use of water is excluded, and that of earth and sand undesirable, because both dirty the oil.

To Glue in Brass Ornaments.—The falling out of ornaments embedded in wood, where a visible screw is not desirable, is frequently very troublesome, and a renewed gluing in rarely obviates the evil, if it is omitted to dip the metal pieces previously in weak nitric acid for about half a minute. Such a bath, with subsequent drying, imparts a moderate roughness to the metallic surfaces, which makes the glue "seize" much better. The glue employed must be exceedingly viscous and never brittle. It is prepared as usual and receives a small addition—about a teaspoonful—of glycerine and as much of slaked lime. During the boiling the mixture should be stirred together intimately, so that the admixtures can properly combine with the glue. It should be applied hot on the slightly warmed pieces, which should be quickly pressed into the wood. The glue must not be thin, but sirup-like. Metal objects inlaid in this manner never drop out from the wood; they can only be torn out by force, on which occasion a thin layer of wood is carried along.—Zeitschrift für Drechsler, etc.

Treatment of Lime.—Lime ought to be, to the painter, a universal material, and yet many do not know how to handle it, and to use it in the proper place, says Ad. Körbler, in our Vienna contemporary, the Dekorateur. Lime is especially useful for façades, churches, gateways, open halls, and verandas and particularly on damp walls. In all these places size-paint would not be suitable as the size would quickly putrefy, owing to the influence of the changes of temperature and dampness, thus losing its binding power, while the permanency of the lime is enhanced by the action of the oxygen in the air. Especial durability is obtained by roughening old walls with coarse pumice stone before painting, subsequently washing off the walls or at least removing the dust. Peeling of a lime coating is due to too thick an application or to putting on a fresh coat before the first is dry.

In order to enhance the durability of the lime various binders may be added to it, as follows: If more earth colors are to be added to the lime than it is capable of binding, caseine size should be employed. The caseine is rubbed up, together with the milk-water, with unslaked lime and thinned with milk. In Switzerland lime slaked with caseine water is used, thinned with milk, and the durability is excellent. Frequently kitchen salt or rock salt is also added, but this is only advisable for white work, as the salt sometimes effloresces, and the colored coating shows white spots after a few weeks.

Varnish and linseed oil also contribute largely to increase the permanency of the lime, but it is best to add these binding agents during the slaking.

Blood is likewise a good binding material. It must be allowed to stand a few days, after hot water has been poured on it. Before use it has to be stirred up well and sifted. Besides, it is necessary to add, on account of the foul odor, 1 kilo. of boracic acid to every 100 kilos. of lime for disinfecting purposes.

Green vitriol imparts to lime a yellow color similar to ocher; copper sulphate in lime gives a handsome blue-green; green vitriol, copper sulphate, and lime give a nice sap-green; and to obtain a fine blue, take a sulphuric solution of cobalt. Such coatings adhere excellently to damp walls, as the substances admixed are much better than earth colors. At the same time they are much cheaper, for 1 kilo. of vitriol is sufficient for a room of considerable size.

All these chemical coloring substances are dissolved, if to be used at once, in hot water, but the solution can also be made with cold water if one waits a few hours. It still deserves mention that these vitriols are not injurious to the skin, the floor or the brushes, that they are not caustic and do not burn.

For smoky café ceilings it is well to force the thick soft soap together with thick lime, to dilute with water and to spread out rather compact. But green vitriol is also a good medium for such ceilings. Coat the ceiling previously with lime and green vitriol, let this dry thoroughly, and only then coat with strong soap. It will be found that green vitriol will appear olive green in the receptacle and draws together into a thick paste; this should not cause one any misgivings; it can, after all, be flowed on like thin paint, and turns a handsome ocher yellow.

By some experiments with the above chemicals in the employment of the quantity, the necessary experience in mixing and tinting will soon be acquired.

A Suitable Ration for the Tropics.

A ration for use by troops in the tropics must be non-irritating, easily transported, and, above all, easily preserved. The beef component and salt pork should be reduced one-half, farinaceous food being substituted therefor. Salt meats should not be issued more than once or twice a week, and if meat is needed, fresh meat should be supplied. Of cereals, hominy is the best, as the husks are removed in the process of manufacture. Equally valuable is rice, and the white bean of this country should not be issued, but instead the red bean commonly found in the tropics, as it breaks up rapidly in cooking and is more digestible. These beans and hominy form the staple diet of the Mexican army. In addition to the above, apples and prunes should be added to the ration for the tropics.

The German soldier in the tropics, says Dr. L. L. Seaman, Major of the U. S. Volunteer Engineers, in a recent lecture before the New York Academy of Medicine, reported in The Medical Record, gets 5·33 ounces of fresh meat or 4·4 ounces of salt bacon, while he receives 79 ounces of vegetables, including potatoes. The Japanese soldier receives a ration of 36 ounces of rice and an allowance of about 6 cents for his meats, tea, etc.

The Surgeon-General's commission, which has just returned from the tropics, insisted that no improvement could be made in the diet of our soldiers. At present the daily ration of the soldier in the United States army consists of fresh meat, 20 ounces; or salt beef, 22 ounces; or pork or beef, 12 ounces; bread or flour, 18 ounces; potatoes, 16 ounces; peas or beans, 2·40 ounces; or tinned tomatoes, 5·33 ounces; rice, 1·60 ounces; sugar, 2·40 ounces; coffee, 1·60 ounces; salt, 0·25 of an ounce. The travel ration was made up as follows: Hard tack, 1 pound; beef, canned, 0·75 of a pound; baked beans, 0·33 of a pound; sugar, 1·5 pounds. The ration, as given, was the ration for soldiers in Alaska through the winter of a year ago, and was essentially the same as was issued to the army in Cuba. It is estimated that one-sixth of the total income of food is expended on mechanical force and five-sixths for the production of heat.

The general experience of inhabitants of warm climates was in favor of a diet which was chiefly vegetable. This offers a sufficient supply of albuminoids without giving an unnecessary amount of heat-producing ingredients. Dr. Seaman argues that the food products of each one would be found to be peculiarly well adapted for those particular regions. The natural appetite instinctively inclines one to eat those articles of diet best suited to the particular zone in which one happens to be.

The ration of the British soldier in India has a meat component which is less by from 4 to 6 ounces than in the United States ration, and the rice was greater by 4·2 ounces; but even so, the British ration has been criticised chiefly on the ground that it was too liberal, as it was well known that a moderate quantity of food was most desirable in the tropics.

Central Africa Volcanoes.

Captain Benthe, of the German army, has just returned from his ascent of Mount Kirunga. The active volcano is north of Lake Tanganyika, and is over 12,000 feet in height. He was the second to climb the crater—a most difficult undertaking, which occupied two days. Count von Götzen, who discovered the mountain, found that lava was bubbling up through places in the bottom of the crater. Captain Benthe found that the crater was full of water, which indicates that for some time the volcano has not been in a state of eruption. All the surrounding regions are covered with lava, and many natives live in small natural caverns roofed over by sheets of lava. According to The New York Sun, the explorer discovered nine new lakes in this volcanic region. On the whole, Africa has remarkable immunity from subterranean disturbances of all kinds. The only part of the continent which is known to be subject to earthquakes is the region of the Atlas Mountains, in Morocco, which occasionally share the disturbances which now and then cause considerable destruction in the neighboring Iberian peninsula.

A Serum Cure for Pneumonia.

One of Prof. Koch's pupils, Prof. Wasserman, thinks that he has discovered a serum cure for pneumonia. According to a cable dispatch to The New York Sun, he does not commit himself to a definite statement, as he is mindful of former disappointments which advanced experimentalists have suffered, but prolonged experiments with rabbits and mice have convinced him that an anti-toxin is produced in the red marrow of their bones and in the marrow of human beings who have died from pneumonia.