

intensity of the standard note is measured on a scale of decibels above an arbitrary zero near the threshold of hearing; the corresponding loudness is then expressed on a numerically identical scale of phons. The various subjective noise meters on the market determine the equivalent loudness of noises in phons by matching them by ear against the standard note. The objective meters, on the other hand, depend on the physical measurement of the intensity by a microphone; they can, however, be made to stimulate the ear and so compare the loudnesses of similar noises. The new acoustics laboratory at the National Physical Laboratory has greatly facilitated investigatory work on the steps required to reduce sources of noise, on the noise proofing of walls and on the noise absorption of building and other materials. The last line of defence against noise in a building is the use of surface absorbents. Ordinary hard plaster is a better reflector of sound than a mirror is of light, so that in modern rooms designedly free from curtains, upholstery and carpets, the noise level can become uncomfortably high unless one of the commercially available acoustic absorbents is applied to the walls or ceilings.

Experimental Hand-Rearing of Game Birds

ORNITHOLOGISTS and students of game birds have become increasingly interested in experiments in hand-rearing and introducing game birds to new areas, and what is believed to be the first ptarmigan (*Lagopus leucurus*) to hatch in captivity was from one of eighteen eggs collected by Dr. A. A. Allen, of the Department of Ornithology of Cornell University, near Churchill, Hudson Bay, and put under bantams at Ithaca (*Scientific American*, Nov. 1934). Science Service, of Washington, D.C., reports that a second batch of twenty ptarmigan eggs has been obtained from Canada and put under bantams, though several eggs have been broken by the foster mothers. During the present year, the first introduction, and hatching, of English pheasants (*Phasianus colchicus*) in Uganda was accomplished by the Agricultural Department at Kamala (T. W. Chorley, *Field*, Aug. 4, 1934). The eggs were obtained by Mr. T. W. Chorley, of the Agricultural Department in Uganda, from the Silverdale Game Farm, Lancashire, and arrived by air mail on May 3. Next day they were put under two native fowls, and three chicks hatched on May 27, and the remainder on May 28, 85 per cent of the imported pheasant eggs hatching. Unfortunately, two heavy storms broke out in the first three weeks, and several birds died, but the remainder did well.

Electricity on Board Ship

THE paper read by C. W. Saunders, H. W. Wilson and Dr. R. G. Jakeman to the Institution of Electrical Engineers on November 22 on the generation, distribution and use of electricity on board ship is a timely one. Although electricity was used in the British Navy for various purposes so far back as 1874, it is only since the advent of the Diesel engine that it has been largely used. To-day, almost all

auxiliary machinery—from the windlass in the bows, through the engine room and hull, to the steering gear in the stern—is electrically operated in important ships. In a 20,000 ton turbo-electric passenger liner, the propelling machinery, usually two turbo alternators, would be about 20,000 horse power and there would be usually four motors to which they send the power. In addition, there would be four main generators each of a 1,000 h.p. The steering gear requires 84 h.p., the capstan machines 536 h.p. and the boat davits 120 h.p. For the fans 500 h.p. is required and for the refrigeration 290 h.p. Compared with these numbers, the 31·5 h.p. required for the passenger lifts seems small. A modern liner is really a large floating hotel, and when at sea the travelling public demands a standard of comfort as high as that obtainable on the best hotels ashore. Consequently the most modern types of lighting, heating and cooking equipment are installed. The galley alone at times of maximum load may require 900 h.p. In the *Queen of Bermuda*, for example, there is one 450-line telephone board, 250 electric signs, 2,250 bell pushes, 400 electric radiators, 650 electric fans for cabins, 410 miles of conductors in cables and wires and 20,000 electric lamps. For very large ships it is generally agreed that turbo-electric drive is the most suitable at the present time.

De la Beche's "Researches in Theoretical Geology"

PUBLISHED in 1834, unpretentious in size and style (12mo.), De la Beche's work was especially welcome to the younger geologists of the time as a philosophical treatise, comprehensive and helpful in design. This little volume had an interesting preface explaining the author's position. It ran as follows:—"Although the theory of central heat and the former igneous fluidity of our planet have been much dwelt upon in the following pages, the author trusts that he will not be considered so attached to these views as not to be ready to reject them and embrace others which may afford a better explanation of an equal number of unobserved facts. . . . It can only be amid a thousand errors, and by a determination to abandon our preconceived opinions, when shown to be untenable, not by pertinaciously adhering to them . . . that we can approximate towards the truth. By strictly advocating a particular theory, prominently displaying those facts only which may appear to afford it support, we are in perpetual danger of deceiving ourselves and others." Finally—"We may conclude that whatever changes our planet may suffer, either from external or internal causes, and the necessary conditions exist, life will be created to suit those conditions; even after man, and the terrestrial animals and plants contemporaneous with him, may have ceased to live on the surface of the earth."

Proceedings of the Fifth Pacific Science Congress

It is hoped to publish very shortly the complete *Proceedings* of the Fifth Pacific Science Congress which was held at Victoria and Vancouver, Canada, in June 1933. The publication will be in five volumes: