electric beam and this in turn is transformed by the fluorescent screen into variations of light. The scanning is linear and is synchronised at the end of each line, the impulses being transmitted through the same channel as the picture signal. The whole system is completely automatic and is almost as easy to operate as an ordinary radio receiver. The practical details have been all worked out and it looks as if a high grade television transmission set of this type will soon be on the market.

Glass Windows and Ventilation Engineering

IT is well known that the windows of houses exposed to the sun's rays act like heat traps. They permit most of the radiant energy from the sun to pass into the building but block the low temperature radiation from inside surfaces passing out. Science Service has issued a report of results obtained by research physicists of the American Society of Heating and Ventilating Engineers in their laboratories. Formerly it was thought that glass absorbed only about ten per cent of radiation at low temperatures. The experiments show that a temperature of 550° F. must be reached before any appreciable amount of the radiation passes through plate glass. Even at 1,000° F., only a small amount passes through. Glass obviously acts as a very efficient heat trap and this has to be taken into account by the ventilating engineer. In many modern buildings, a side built almost entirely of glass is exposed to the sun's maximum radiation. On a hot summer day, the glass permits the heat from the sun to enter and practically none of it escapes. Indoors, therefore, it becomes unbearably hot. The cost of keeping a building of this nature cool is practically prohibitive. Awnings which deflect the light and are hung outside the windows are perhaps the most efficient. Shades and blinds are of little value as the heat passes through the glass, heats the blind and is convected upwards, thus heating the room. Tests proved that there is no practical difference in efficiency between clear and coloured glass.

Sorting Foods by Reflection of Light

IT seems that the sorting out of foods by the reflection of light will soon be used in regular commercial practice. It is certainly quite feasible for sorting out foods the quality or maturity of which depends on their colour. Science Service has issued a description of a bean elevator that sorts out white pea beans by means of a photoelectric tube. The device is in use in Lowell, Michigan, and it is said that the plant could be adapted for the sorting of peanuts, coffee, almonds and other foods in which colour is the determining factor when making a selection. It is also possible to sort red kidney beans, green peas and other food crops as easily as white beans are now sorted. A battery of a hundred photoelectric cells is used in the Lowell elevator. It operates with such precision that even although the discoloration of the bean is barely discernible to the human eye, it is rejected with high precision. The individual machine is quite small, consisting of a drum with a series of small holes in the rim. Each bean passes in review before a photoelectric cell. The cell accurately measures the reflection of the light from the bean on it. If the light varies, an electric impulse is transmitted to a thyratron tube which permits sufficient current to pass to operate an electromagnet with a trigger-like hammer at one end. Beans not of the proper colour are dislodged from the vacuum drum by the hammer while good white beans pass into a hopper. The sensitivity of the amplifier can be adjusted until practically only white beans pass undisturbed. Each machine can do as much work as six girls hand-picking beans. A similar device might probably be used for sorting out buttons and other coloured objects.

Physical Tables

VOL. 88 of *Smithsonian Miscellaneous Collections* constitutes the eighth edition of the "Smithsonian Physical Tables", the first edition of which appeared in 1896. The preparation of the new edition has been carried out by Dr. F. E. Fowle, of the Smithsonian Astrophysical Observatory, who has availed himself of suggestions and data furnished by authorities in the different fields. The volume has been enlarged to nearly 750 pages and it now contains 871 tables and an index of 22 pages. Where necessary a table is preceded by a short account of the laws relating to the subject, adapted from the writings of some authority to which a reference is given. In cases where recent advances have been rapid and fundamental, the tables and introductions have been supplied by a recognised authority, as for example those on the series relations in atomic spectra, which are by Dr. H. N. Russell. In addition there are ample references to further sources of information. The volume will be welcomed by all who have to search for reliable values of physical constants.

Medical Research in South Africa

THE annual report for 1932 of the South African Institute for Medical Research, Johannesburg, by the director, Sir Spencer Lister, recently received, gives an account of the work, research and routine, conducted during the year. A quantitative study of the blood-complement in man has been commenced, and in pulmonary tuberculosis and leprosy a considerable proportion of the cases tested showed very small amounts or no complement in the blood. An investigation of South African strains of rabies virus was begun, and nearly every case of human rabies investigated was found to have been caused by the bite of the yellow mongoose or genet cat, and not by a dog bite. Antivenomous serum of exceptional potency for the treatment of snake-bite has been prepared by the use of massive doses of venom modified and rendered atoxic by means of formalin, with subsequent concentration of the serum so obtained.

Study of Canadian Coals

A STRIKING feature of Canada's fuel problem is the absence of coal in the central areas where population

is densest, so that fuel has to be imported from the United States and Wales, or transported from Nova Scotia via the St. Lawrence—navigable only in summer. This has led the Canadian Department of Mines to give special study to the nature, preparation and storage of coals from the Sydney Area, Nova Scotia, described in a recent report by R. E. Gilmore and R. A. Strong (*J. Canadian Mining and Metallurgy*, p. 317; 1933). Storage in Canada is a greater problem than in Great Britain. Observations are recorded on coal piles of depth reaching 40 ft. Even at this depth, the coal was safely stored. Washing was found to reduce the tendency of the coal to heat. The ash of these coals is fusible and therefore special attention has been given to the relation between the fusibility of the ash and the behaviour of the coke from the coal, when burnt in domestic boilers.

Birds and Earthquakes

The Long Beach earthquake of March 10, 1933, began at 5.55 p.m. with the most severe of a succession of shocks which continued for twenty hours. At this time, about sunset, a flock of a hundred Brewer blackbirds (*Euphagus cyanocephalus*) had retired to roost in some medium-sized trees. M. P. Skinner records that although no preliminary shocks were felt by human beings, these birds became uneasy before the severe shock (*Condor*, **35**, 200; 1933). During the shock the birds began to leave the roost, and rose slowly in ascending spirals above the trees to a height of about 140 ft. They then descended slowly and settled noisily in the roost; thereafter throughout the minor shocks they showed no sign of disturbance. At their usual time near dawn, meadow-larks and mocking-birds began to sing and kept up their morning songs in spite of the tremors that were occurring almost every minute.

Nature of Saturn's White Spot

WRITING from Ocean Island, Central Pacific, a correspondent, whose name we regret to be unable to decipher, suggests that the white spot recently observed on the planet Saturn might consist of water which has been raised from lower levels into a region where it would solidify into ice-floes or snow-fields. He adds, "The white spot may represent the result of a widespread heating of the lower Saturnian atmosphere and consist of a continent of ice floating in air, buoyed up above its normal level by rising air beneath it."

American Association for the Advancement of Science

THE ninety-third meeting of the American Association for the Advancement of Science will be held at Boston on December 27–30 under the presidency of Dr. H. N. Russell, professor of astronomy and director of the observatory in Princeton University. The title of the address of the retiring president, Prof. J. J. Abel, formerly professor of pharmacology in Johns Hopkins University, will be "On Poisons and Disease, and some Experiments with the Toxin of the *Bacillus tetani*". On December 30, Prof. Harlow Shapley, director of the Harvard Observatory, will be presented with the Rumford medal of the American Academy of Arts and Sciences; his address on this occasion will be entitled "The Anatomy of a Disordered Universe". The vice-presidential addresses in the several sections will be delivered by the following: A (Mathematics), Prof. H. H. Mitchell, University of Pennsylvania; B (Physics), Prof. D. L. Webster, Stanford University; C (Chemistry), Prof. F. C. Whitmore, Pennsylvania State College; D (Astronomy), Dr. P. W. Merrill, Mount Wilson Observatory; E (Geology and Geography), Prof. W. H. Hobbs, University of Michigan; F (Zoology), Prof. A. S. Pearce, Duke University; G (Botany), Prof. H. L. Shantz, University of Arizona; H (Anthropology), Prof. C. H. Danforth, Stamford University; I (Psychology), Prof. W. S. Hunter, Clark University; K (Social and Economic Sciences), Prof. W. F. Ogburn, University of Chicago; L (Historical and Philological Sciences), Dr. W. G. Leland, American Council of Learned Societies; M (Engineering), Prof. D. C. Jackson, Massachusetts Institute of Technology; N (Medical Sciences), Prof. C. R. Stockard, Cornell University; O (Agriculture), Dr. J. H. Gourley, Ohio Experiment Station; Q (Education), Prof. S. A. Courtis, University of Michigan.

Announcements

THE following officers of the Royal Society of South Africa have been elected for 1934: *President*, Dr. A. W. Rogers; *Treasurer*, Dr. L. Crawford; *General Secretary*, A. J. S. Goodwin; *Editor*, Prof. R. S. Adamson; *Librarian*, Prof. E. Newbery.

"CLASSICS OF SCIENCE" is the title of Catalogue 29 of Messrs. E. P. Goldschmidt and Co. Ltd., London, W.1. Its 220 items contain many rare and important original editions of works outstanding in the progress of scientific discovery. Some early books on astronomy, optics and magnetism are of special interest.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—An assistant lecturer and demonstrator in geology in the University College of South Wales and Monmouthshire The Registrar, University College, Cardiff (Jan. 1). An inspector for the purposes of the Diseases of Animals Acts, 1894–1927, in the Ministry of Agriculture and Fisheries—The Secretary, Ministry of Agriculture and Fisheries, 10, Whitehall Place, London, S.W.1 (Jan. 4). A water engineer at Liverpool—The Town Clerk, Municipal Buildings, Liverpool, 2 (Jan. 9). Examiners and assistant examiners for the School Certificate Examination of the Central Welsh Board—The Clerk to the Central Welsh Board, Cardiff (Jan. 12). A plant pathologist at the Waite Agricultural Research Institute, Adelaide—The Secretary, Universities Bureau of the British Empire, 88a, Gower Street, London, W.C.1 (Jan. 15). A special lecturer in aeronautics in University College, Hull—The Principal.