

Scientifiques et Industrielles", six deal with physical questions. M. Jean Perrin, under whose direction the pamphlets dealing with atomistics are issued, is himself responsible for four entitled "Grains de Matière et de Lumière". The first is on the existence of the 'grains', that is, of atoms, electrons and photons, the second on the structure of the atoms, the third on the complexity of their nuclei and on their radio-activity, and the fourth on the changes which can be produced in them by bombardment. Prof. Joffé of Leningrad, who is dealing with the physics of solids, contributes a somewhat longer pamphlet, on semi-conductors, the conductivity of which is due to a small fraction only of the valence electrons attached to their atoms. M. Y. Rocard presents the first pamphlet of the series on hydrodynamics and acoustics, on the statistical theory of fluids and the equation of state, by M. J. Yvon. Each pamphlet gives a concise and readable account of the present state of the subject with which it deals, and is written by one who has himself made distinct and valuable contributions to our knowledge of it.

Radio Data

A SECOND edition of "Radio Data Charts" by Dr. R. T. Beatty (Iliffe and Sons, Ltd. 4s. 6d. net) is to be welcomed, since the opportunity has been taken to extend its scope to cover the most recent advances in radio technique. The various abacs provided now cover wave-lengths down to five metres, while provision is made for audio-frequencies over the range 20–10,000 cycles a second. This publication contains a series of thirty abacs with explanatory notes and examples, by means of which many of the quantities required in radio-frequency work can be obtained directly without the necessity for laborious calculation. In addition to the means for obtaining the inductance, capacitance and reactance of coils and condensers at both audio- and radio-frequencies, charts are given for obtaining the efficiency and time constant of a grid leak and condenser combination, for designing coils to have a minimum radio-frequency resistance and for the design of attenuation circuits, to select only a few typical examples. The whole series of charts is printed in a clear and easily accessible form and will be found to be most valuable to engineers, experimenters and students dealing with radio-frequency work.

Clough Memorial Research Fund for Geology

THROUGH the generosity of Mrs. Clough, a fund was established in 1935 in memory of her late husband Dr. C. T. Clough, for the purpose of encouraging geological research in Scotland and the north of England. The north of England is defined as comprising the counties of Northumberland, Cumberland, Westmorland, Durham and Yorkshire. Under the terms of administration of the fund a sum of approximately £30 will be available annually. Applications for grants for the period April 1, 1936–March 31, 1937 should state the nature of research to be undertaken, amount of grant desired, specific purpose for which the grant will be used and whether any other grant-in-aid has been obtained or applied

for; they should be in the hands of the Secretary, Clough Memorial Research Fund Committee, Edinburgh Geological Society, Synod Hall, Castle Terrace, Edinburgh, not later than February 1, 1936.

Statistics of the British Cinema Industry

AT the meeting of the Royal Statistical Society on December 17, Mr. S. Rowson read a paper entitled "A Statistical Survey of the Cinema Industry". When the figures disclose that in 1934 there were 957 million admission tickets sold for the sum of £40,950,000 (the average price of a ticket thus being 10·3d.), and when one further considers the character and splendour of the modern cinema together with the fact that four out of every five people visiting the cinema pay not more than one shilling for a ticket, the cinema is shown to be as one of the sociological wonders of the century, meriting attention and investigation. Of the year's revenue from admissions, the Government claimed £6,800,000 in entertainment duty. The average weekly cinema attendance throughout the year is about 18½ millions. At the end of 1934 there were 4,305 cinemas in Great Britain, with an average of 900 seats in each. In the London postal area alone, there were 401 cinemas. Of the various districts Lancashire had the greatest number with 699, Midlands next with 585, and Yorkshire and district next with 534. North Wales had the smallest number with 62—as opposed to 259 in South Wales. In the London area there was one seat for every 14 of the total population; in the Lancashire area one to nine; in the eastern counties one to nineteen; in South Wales one to ten. Eliminating the population under 15 as infrequent cinema-goers—the number of persons per seat were: in London, 10·9; in the Eastern Counties, 14; in the Midlands, 9·6; in Yorkshire, 8·0; in Lancashire, 7·0; and in South Wales, 7·6. It will be seen from the foregoing that the problem of redundancy or overbuilding is now becoming serious.

Food of the Bullfrog

MR. S. W. FROST had a bullfrog of 200 gm. under observation in a cage provided with a small pond ("The Food of *Rana catesbeiana*, Shaw", *Copeia*, No. 1; 1935). Its feeding capacity is amazing. During the summer it ate more than four hundred and twenty-seven grams of food—more than twice its own weight—in less than five months. The artificial conditions may, however, have caused it to eat more than it would have done in natural surroundings. The food eaten included 56 amphibians (frogs, toads and salamanders), 63 insects (beetles, moths, caterpillars, grasshoppers and cicadas), slugs (*Limax maximus*) and birds. As an example, on June 23 it ate 2 *Promethia* moths and 8 other insects; June 24, 1 *Promethia* moth, 3 other insects and 1 nestling sparrow (18 gm.); June 25, 1 frog (6 gm.); June 16, 2 frogs (13·5 gm.). It has a curious method of accepting its food, preferring to take it under water; "sometimes it snatches a morsel of food on the bank of a stream or pond, but invariably jumps into the water and submerges it to swallow".