research on such subjects as flavour chemistry, the proteins of milk, fat oxidation and micro-structure of certain milk products, and yet at the same time much is being done which is of immediate practical application on a commercial scale. For example, for the manufacture of casein a new method of precipitation has been devised. When the previous annual report was written, this method was only at the pilot plant stage, but already it is being widely used in Australia with probable savings of some £150,000 a year. Much has been done also on the mechanization of cheese manufacture, a subject of world-wide importance, and it is significant to note that some of the machines that have been evolved in Melbourne for this purpose have already been exported to Britain and the United States. Then again, a cheese-drying process developed here is now being used successfully not only in Australia but also in Japan. The achievements of this Division illustrate the outstanding progress that can be made when basic science and its practical application on a manufacturing scale are both actively encouraged in one and the same institution.

Nocturnal Intensity Recorder

Instruments for the measurement of the intensity of the night airglow usually consist of a photoelectric-type photometer with narrow band-pass filters or with birefringent filters, and are made either to look at a fixed portion of the sky or to scan the sky at various altitudes and azimuths. A new instrument, called a 'Noctinograph' (Nocturnal Intensity Recorder), has been designed and built in the Radio and Electrical Engineering Division of the National Research Council, Ottawa, Canada. The instrument scans the entire dome of the sky and records the intensities of the night sky radiations in four wavelengths of the visible spectrum several times during a night according to a predetermined programme. It consists of a scanning-type photometer with four, replaceable, very narrow, band-pass interference filters, and is installed on the roof of the Springhill Meteor Observatory near Ottawa. A detailed description of the instrument and its performance is given by F. V. Kulkarni and J. C. Barnes in the January issue of the *Canadian Journal of Physics* (**42**, 1; 1964). The five components of the 'Noctinograph' consist of the scanner, recorder, twilunar clock, mixer chassis, and power pack and amplifier. The scanner automatically scans the sky in concentric circles around the zenith. The EMI 9560*B* photomultiplier is mounted on an altazimuth mounting. Scanning with one filter takes 3·5 min and with all four filters a total of 14 min. The scanner and recorder then rest for 16 min and the next scan begins after a half-hour pulse has been received from the twilunar clock. A set of recorded scans taken on the nights of May 21–22, 1963, are shown in the article. Intensities obtained with the 5400 Å filter are less than those obtained with the 5577 Å filter at all points in the sky. The first filter is used to see the 'background', and the second filter gives the intensity of $[0]_1$ line together with the background. The other two filters, transmitting around 6300 Å and 6257 Å, serve to separate the $[0]_1\,^1D_2$–$^3P_2$ line from the (9–3)OH band head at 6257 Å.

Stratigraphy of the U.S.S.R.

In 1963 the Academy of Sciences in Moscow announced the forthcoming publication of a monumental series of fourteen large volumes on the stratigraphy of the U.S.S.R., sponsored jointly by the Academy, the State Geological Committee, and the Ministry for Higher Specialist Education. The first work to appear in this library is a well-produced monograph on the Upper Precambrian (Riphaean) formations (*Stratigrafiya SSSR: Verkhnii Dokembrii*. (Stratigraphy of the U.S.S.R.: Upper Precambrian.) Pp. 716+94 figs.+18 pl. Gosgeoltekhizdat, Moscow, 1963. Price 4r. 85k. (Russian only)). This is of special interest since unmetamorphosed rocks of this age (from 1,500 m.y. to 570 m.y. ago) are extensively developed within the U.S.S.R., and a proper understanding of their nature is fundamental to the resolution of many debated problems of Earth history. The book is a co-operative effort by many authors, but the overall responsibility of co-ordinating and editing it (in addition to that of writing many chapters) has been admirably discharged by Dr. B. M. Koller. Two-thirds of its pages are taken up with regional stratigraphical detail, and this is followed by chapters on palæontology (with 18 plates illustrating stromatolites, medusæ, and other primitive fossils), on radiometric dating, on tillites and related glacial sediments, on topics such as trans-continental and world-wide correlation, palæogeography and general questions of the contemporary development of the Earth's crust, and finally on ore deposits. The last-mentioned include jaspilite-type iron quartzites, extensive metasomatic siderite ores in carbonate sediments, manganese ores, magnesite deposits, indications of bitumens, oil and gas, and the important and widespread Upper Procambrian phosphorite deposits discovered in the past decade. The primitive fossils, the hydrocarbons and the phosphorites point to the existence of abundant organisms in Upper Precambrian times. An extensive bibliography occupies 30 pages, and there are welcome indexes of stratigraphical, geographical, palæontological and personal names.

Standardization of Diamond Abrasive Grit

Diamond grit, or 'splint' as it is sometimes known, finds very considerable use in a variety of industries, notably those concerned with the use of masonry and concrete saws, metal-l onded and resin-bonded grinding wheels, and in lapidary laboratories and workshops for arming mild-steel mineral and rock-cutting disks. It would appear that hitherto there has been little attempt at standardization of this important product, not only as regards quality but also more particularly in terms of strength as a function of grit size. According to N. G. Belling and H. B. Dyer, in a publication entitled *Impact Strength Determination of Diamond Abrasive Grit*, particle strength is the factor which has most influence on diamond grit efficiency (Pp. 12. London: The Industrial Diamond Information Bureau, 1964). Generally, with saws and metal-bonded wheels, it is found that optimum strength is the maximum strength obtainable. "For resin-bonded grinding wheels, the situation is more complex. First, the optimum strength is a function of the grit size. Secondly, for a given size, the optimum strength varies with the type of resin bond used. A strength appreciably higher or lower than the optimum results in reduced wheel efficiency. Thus, a further criterion is that the grit must be as homogeneous as possible in terms of strength." In the experimental work involved it was necessary to define the particular strength property to be measured, and it appeared that in nearly all applications of diamond grit dynamic impact strength was the factor to be sought in determining the quality and efficiency of a grit. It was realized that whatever machine for this purpose was used, the method of strength measurement had to be quick, uncomplicated, capable of dealing with large numbers of fine particles of arbitrary shape. In the event, what is known as the 'Friatest Impact Tester' was designed and built; details of this apparatus and illustrations, also of its operation, are given in this paper. The authors conclude that the Friatest is a most valuable instrument and that with its use "the major problem of a reproducible test for diamond grit strength has largely been solved". The index of impact strength of a given grit can now be directly compared with values obtained on other grits in other laboratories. This technique permits standardization of quality control of the properties of various natural and synthetic diamond grits, and ultimately the widespread use of this apparatus should lead to a better understanding of the properties of these products, hence to their greatly improved characteristics.