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a consistent direction of magnetization up to 4° away from the magnetizing field direction. This natural anisotropy precludes the use of separate specimens for non-pressure and pressure experiments.

This factor, together with the grain-size factor, may have contributed to the experimental results which led Stott and Stacey to suggest that the effect of pressure on a rock acquiring a thermoremanent moment was completely reversible.

It is hoped to publish in the near future a fuller description of the experiments and results of this investigation, which has been carried out with the supervision and encouragement of Prof. J. M. Bruckshaw.

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METEOROLOGY

Autumn Temperatures in the Red Sea Hills

During the autumn vacation, we made geomorphological and biological surveys in the Red Sea hills and coastal plain north of Port Sudan. Details of these will be published later. While trekking among uncharted jebels in the area 36·50° E., 21·00° N., high surface temperatures were recorded, especially on wind-blown sand. For example, on September 24, 1960, at 1300h. local time, when the air temperature varied between 40·5 and 43·5° C. (105–110° F.) the surface sand temperature was 83·5° C. (182·5° F.) as measured with an electrical resistance thermometer employing thermistors[1]. The only animal to be seen was a solitary grasshopper. Four hours later, when the temperature had fallen to 32·0° C. (90·0° F.), the sand temperature had dropped 45·5° C. to 38·0° C. (100·5° F.) and some ants were crawling over it.

These results give some idea not only of the enormous temperature fluctuations that occur in desert regions[2,3] but also of the high ground temperatures that are by no means unusual in the Sudan even quite late in the year. They compare with 84° C. (183° F.) recorded on the Loango Coast close to the equator, 78° C. (172° F.) on a sand dune in the Sahara[2], a black bulb temperature and sand surface temperature of 58° C. (136° F.) near Cairo[3]. Very much higher temperatures were obtained in fine wind-blown sand, which must have high insulating properties, than on mixed or coarse sands, gravel or rock surfaces.

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RADIATION CHEMISTRY

Kinetics of Radiation-induced Chemical Reactions

The development of linear accelerators which can produce electron pulses a few μsec. long with a peak current of several hundred m.amp. and an energy of several MeV. has made possible the study of chemical reactions by techniques similar to those used in flash photolysis. A single pulse from this type of machine will deliver a dose of the order of several thousand rads to a few ml. of liquid and should in many cases produce a chemical change large enough to be easily detectable by optical absorption with a time resolution as low as 0·1 μsec. Experiments of this kind, in which the production of the benzyl radical from benzyl compounds in organic solutions was investigated, have already been described by McCarthy and MacLachlan[1]. I am doing some similar work on various aqueous solutions, and this communication briefly describes my apparatus and some of the preliminary results obtained with it.

Irradiations are carried out at the Linear Accelerator Facility in the Scientific Apparatus Department, Associated Electrical Industries, Ltd., Manchester, which has available a machine producing 2 μsec. pulses of 4-MeV. electrons[2]. The irradiation cell consists of a thin-walled 'Pyrex' tube 20 mm. diameter and 50 mm. long, closed with quartz end-windows. The electron beam enters through the side of this tube, and a beam of light from a high-pressure mercury lamp passes along its axis. The optical system is arranged to focus the transmitted light on to the entrance slit of a monochromator and then on to a photocell. The photocell output passes through an amplifier with a rise time of about 0·1 μsec. and is applied to the vertical deflexion plates of a cathode-ray oscilloscope the horizontal sweep of which is arranged to start a few μsec. before the electron pulse. In this way traces are obtained showing the time variation in optical absorption of the liquid in the irradiation cell at any chosen wave-length. With the monochromator entrance slit closed a spurious signal is obtained and shows as 'noise' on the oscilloscope screen. This noise lasts for 2 μsec., and is caused by electrical interference produced at the same time as the pulse. Its amplitude is equivalent to a few per cent of the full signal obtained from the light source, and this limits the change in light intensity which can be detected during the pulse to a few per cent. This relatively low level of interference has been achieved by suitable electrical shielding and also by locating the monochromator outside the irradiation area to eliminate gamma-ray effects on the photocell and amplifier. Light is transmitted to the monochromator via an optical system of high aperture with a path-length of about 10 m. Traces obtained with the light source off and the monochromator slit open show an emission of light from the solution caused by the Čerenkov effect. The amplitude of this emission is fairly constant for 2 μsec., and the rise and fall times are a few tenths μsec. The optical system was designed to reduce the quantity of this light reaching the photocell to a minimum, and in practice the amount received is of the order of 10 per cent of the light from the lamp. The true absorption of a solution during the pulse is found by comparing traces made with the lamp on and off. The effects of Čerenkov light and electrical interference become