Attraction between Macroscopic Bodies, Battelle Institut E.V., Frankfurt am Main) on the same topic, is a most satisfying step forward, for it is becoming apparent that in theoretical thin film studies triple phase models must replace simpler single phase models for greater insight into thin film behaviour.

VOLCANOES

Hekla Fires 1970

from our Geomagnetism Correspondent

Most natural phenomena are unpredictable, though it is fair to say that some are less expected than others. The recent eruption of Hekla, Iceland's most venerable volcano if, since the arrival of Surtsey, no longer the most famous, came as a complete surprise. At 2058 on May 5, 1970, twenty-two years after the last eruption and following an unusually short period of dormancy for Hekla, seismographs in Reykjavik began to register earthquake shocks which at 2200 reached a maximum magnitude of 4.

Dr Sigurdur Thorarinsson, Iceland's foremost authority on volcanic activity and veteran of many an eruption. has carried out a preliminary assessment of the visible effects of Hekla's latest outburst. The eruption proper began at 2130, shortly after the premonitory shocks, when a 500 m fissure opened up on the south flank of the Hekla Ridge, another of 300 m appeared on the south-west flank, and a small vent opened up close to the lava crater formed by the 1947–48 eruption. At 1030 the following morning a third fissure, a few hundred metres long, appeared in Skolkviar to the north-east of Hekla. The initial phase of the eruption, characterized by fountains up to 750 m high, lasted two to three hours.

A great deal of tephra was produced during this phase. At least 30 million cubic metres was carried to the north-north-west, reaching the north coast 180 km away only two and a half hours after the start of the eruption. The maximum thickness of the tephra layer was 7 cm at 15 km from the volcano, but had decreased to 0·4 mm at the coast. It was also an interesting example of nature as its own polluter. The tephra contained up to 1,500 p.p.m. of fluorine which quickly proved lethal to grazing sheep. Nor is this problem yet over. The fine-grained tephra near the north coast is washing out only slowly, and the most recent grass growing there is poisonous.

By May 20, when flow from the original fissures ceased, new lava covered an area of almost 19 square kilometres. On the same day a new fissure about one kilometre long opened up and subsequently produced a considerable amount of lava but little tephra. Throughout the rest of May and the first two weeks of June several craters appeared along the new fissure, building up spatter cones. By the middle of June about 200 million cubic metres of lava had been produced, all of which was typical apalhraun (a–a) type.

YLIDES

Inductions and Syntheses

from a Correspondent

The growth of ylide chemistry since the publications by G. Wittig in 1953 was apparent when the Chemical Society held an international symposium on this topic at Leicester from July 14 to 16. Professor Wittig, who comes from the University of Heidelberg, was the guest of honour.

Many speakers dealt with synthetic aspects of phosphorane and sulphurane chemistry, and examples of the utility of phosphoranes in the Wittig olefin synthesis were numerous. Dr H. J. Bestmann (University of Erlangen–Nürnberg) described asymmetric inductions and syntheses using chiral phosphoranes to prepare optically active allenes. Two of Bestmann's colleagues, Drs E. Vilsmaier and R. Saalfrank, reported the preparation of olefins by pyrolysis of phosphonium salts and by reaction of ketenacetal derivatives, respectively.

Several contributions dealt with the utility of ylides for preparing heterocyclic compounds; for example, the synthesis of oxygen heterocycles by decomposition of suitable phosphoranes was described by Dr E. E. Schweizer (University of Delaware), and sulphoranes have been used for the preparations of furans by Dr P. A. Lowe (University of Salford) and of indoles and isoxazoles by Drs P. Bravo and G. Guadiano (Milan Polytechnic).

Dr H. Schmidbauer (University of Würzburg) described the preparation of silylated ylides of phosphorus, arsenic and sulphur, in which the silyl group is both a stabilizing and an efficient leaving group, transferring the ylidic moiety in very mild conditions. The properties and reactions of the ylides formed from various hetero-atoms were compared by Dr A. W. Johnson (University of North Dakota), who drew conclusions regarding the effect of different substituents on the "onium" group.

Tervalent phosphorus-nitrogen and sulphur-nitrogen compounds have been described as "pseudo-ylides", and several speakers described aspects of their chemistry. Dr R. Appel (University of Bonn) reviewed earlier synthetic methods before describing an improved synthesis using phosphine derivatives, amines and carbon tetrachloride that gives almost quantitative yields. These iminophosphoranes and iminosulphuranes undergo many reactions similar to those of the true ylides, but a novel reaction in which aldehydes are inserted between the P–N bond was described by Dr R. F. Hudson (University of Kent at Canterbury).

The chemistry of phosphorin, the phosphorus analogue of pyridine, was the theme of contributions from Drs G. Märkl (University of Würzburg) and K. Dimroth (University of Marburg). They described methods of synthesis of some phosphorin derivatives, the parent compound being unknown. Although these substances can be regarded as phosphorus ylides, they do not undergo the Wittig olefin synthesis, but seem to have some aromatic properties. These are shown by the position of the ring proton resonances in the nuclear magnetic resonance spectra, by bond length measurements using X-ray crystallography, and by certain substitution reactions, for example, coupling with diazonium salts.

It has been suggested that some molecular rearrangements take place through ylide intermediates, and several of these were reviewed by Dr J. E. Baldwin (Massachusetts Institute of Technology), who developed the concept that biogenetic syntheses of certain natural products could be through sulphur ylide intermediates.