suggested—in connexion with other analytical results—that the chief constituent of the particles was of nucleoproteid nature[2].

It has now been found that they are intensively stained by Feulgen's reagent, generally regarded as a histo-chemical reagent for thymonucleic acid. Bacteria and bacterial debris (even a concentrated preparation of debris of phage-size obtained by lysing the organism with the very small phage *S*13 which afterwards could be removed by washing) treated in the same way remain unstained. So the phage-substance seems to be chemically different from any constituent of the bacterial cell normally present in significant amount.

The concentrated and purified preparations of a *Staphylococcus* phage obtained recently by Dr. Elford show exactly the same staining reactions as the *WLL-Coli*-phage.

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M. Schlesinger, *Biochem. Z.*, **264**, 6 (1933).
[2] M. Schlesinger, *Biochem. Z.*, **273**, 306 (1934).

Lightning and Atmospherics

IN NATURE of August 15, on p. 278, I notice a paragraph dealing with atmospherics produced by lightning discharges. From my own observations, I would express the opinion that the statements made in that paragraph only represent a part of the complete picture. There are so many different kinds of atmospherics observed both aurally in radio receivers and visually when they are recorded as by means of cathode ray oscillographs, that a complete generalization in such simple terms as are there expressed is scarcely possible.

With certain classes of atmospherics, in some cases quite a prolonged crackling can be observed lasting as much as a second before the lightning flash is observed visually. In such instances the crackling, one can only presume, arises from initial priming discharges somewhat in the nature of long brushing streamers, such as may be observed with high-tension electrical test apparatus, which brushing ultimately culminates in a complete sparkover. In all cases of observed atmospherics of this nature, the crackling sound of more or less prolonged duration finishes with a loud crack coincident with the final sparkover, which is observed as the visible lightning flash.

This type of atmospheric is only observed with certain forms of thunderstorms and is by no means of general occurrence. In many cases the sounds heard are of a simple click nature, which corresponds to straight sparkover without the preliminary brushing discharges giving the prolonged crackling sounds.

So far as my own observations go, the type of atmospheric particularly referred to, which gives the long crackling noise followed by the final crack of the sparkover, is a much rarer form than the simpler types in which it is obvious that the sound accompanies the visual flash. It is possibly for this reason that little notice has been taken of this form of discharge.

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Colloid Substrate in Photosynthesis

IN an earlier note on this subject[1] it was recorded that in the interaction of two salts in an aqueous medium, leading to the formation of periodic structures (mineral arboreal growth), a colloidal condition is created in the medium, this state remaining stable under the original experimental conditions.

Since then, it has been observed that whilst periodic structures find their existence above the transition point of the colloid to the physico-chemical associations approaching double salts, the range of the colloid state is much wider, extending both above and below this transition point. Thus in the interaction of calcium chloride with sodium carbonate, arboreal growth appears above the hydrocalcite to calcite transition point, that is, at 10°–12°[2] with a range of formation of 10°–12°. But the systematic formation of the colloidal phase itself commences with the appearance of the gelatinous membrane at the interface of the two electrolytes at about 4°, and is produced regularly so long as this membrane exists.

Close observation showed that the colloid was not always confined to the aqueous medium. Very often it was also dispersed in the air above it. During the eruptions from the membrane-protuberances, effervescence on the surface of the liquid could be frequently observed, and by means of a narrow parallel beam of light from a Miller projecting lamp, the Brownian movement of finely divided colloidal matter could be seen in the space above the liquid. The evolution of this effect depended on such experimental conditions as osmotic pressure, height of column of liquid above membrane and character of membrane itself.

In the light of researches by Baly, Dhar and others on photosynthesis, these observations when applied to marine and atmospheric surroundings appear to have an important bearing upon natural phenomena. Details of this work are to be published elsewhere.

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[1] NATURE, **132**, 67 (1933).
[2] Copisarow, *J. Chem. Soc.*, **123**, 785 (1923).

Indication of a Decrease in the Polarizability of a Non-Polar Molecule by Pressure

SOME years ago, results were published of measurements on the dielectric constant of carbon dioxide under pressures up to 1000 atm.[1]. Using Amagat's isotherm data, where available, the Clausius Mosotti function $P = \frac{\varepsilon - 1}{\varepsilon - 2} \times \frac{1}{d}$ was calculated; P is proportional to the polarizability of the molecule. It was stated that P showed a tendency to decrease, the decrease at 1000 atm. being about 1 per cent. It was considered not impossible at that time that this decrease was due to an uncertainty in the density d.

Lately more accurate isotherms of carbon dioxide have been published[2]. Using these data, the value of P has been recalculated. As an example of the results, values of P have been plotted in Fig. 1 against density, and in Fig. 2 against pressure. It can be seen that P decreases with pressure and this