Laboratory studies of soils of varying degrees of erosibility serve two purposes. The first is the determination of the chemical-physical causes of erosibility, the second is the measurement of erosibility as a function of the soil. The study of these interdependent phases of a common problem will be rendered much simpler as soon as an order of erosibility can be established experimentally for a number of soils. At the present time data are being taken at the various erosion stations which in time may make it possible to discount such factors as slope and cover and arrive at such an order for the soils of the erosion experiment stations. In the meantime we are forced to depend upon the observations of field men for the classification of soils into erosive and non-erosive groups. Such observations are not sufficiently accurate to determine the relative erosibility of soils, except for soils which show marked differences in erosional behavior.

While we are, therefore, working under an admitted handicap, we have nevertheless outlined a general program of investigation relative to the erosibility of soils. This program calls for a determination of all the well recognized and measurable soil characteristics, and includes the chemical composition of the colloids of the soils. Because erosion in its simplest expression is, after all, one of the effects of the action of water on soil, particular attention has been given to measurable soil-water relationships as a means of determining the relative erosibility of soils. The bulk of the data of these determinations for the soils of the Erosion Experiment Stations are collected in the U. S. Department of Agriculture Technical Bulletins Nos. 316, 430, and 461.

It is not the purpose of this paper to recapitulate the data of these bulletins. It is the purpose of this paper to indicate the desirability of such data, and to show from a purely theoretical standpoint, and as far as possible from a practical one, how such data may be used to determine the cause and order of erosibility of soils. To do so calls for a clear conception of the major factors influencing soil erosion, and the accompanying diagram has been prepared to show the interaction of the various agencies which influence the erosion of soils. Many of the agencies which appear on this diagram will be subdivided in the discussion that follows. The diagram merely outlines the discussion.

Beginning at the top of the diagram, we find precipitation listed as an important factor of soil erosion. That can scarcely be considered news to a group of soil scientists, and, as a phase of the weather, it is not

which suffers enormous erosion under 40 inches of rainfall may, as far as the soil itself is concerned, be less erosive than some all eroded soil which receives a normal rainfall of 15 inches, and allowance must be made for variations.

This is only part of the story. The precipitation must be considered. Part may fall as rain and part as snow or sleet. Variation in intensity is even more important. An inch of rain falling in fifteen minutes may cause more erosion than the same amount of rain evenly distributed throughout a period of four hours. The duration of rainfall affects erosion, but we prefer the term continuity, since this word implies variation in the length of time during which the rain actually falls. And, last we must consider the season of precipitation, whether the precipitation is received on freshly plowed growing crops, stubble, or frozen soils.

Run-off is a more direct, and at the same time a more complex factor of erosion than precipitation. It is more direct, for there is no run-off there is no erosion. All the variations in precipitation have a counterpart in run-off. It is more complex for it is affected by the permeability of the soil (which is in itself a variable) and by terrain and cover. The term "cover" is intended to include mulch, duff, litter, and vegetation. The term "terrain" includes degree, convergence and variation of all.

We have shown diagrammatically the relation of permeability to run-off, and therefore to erosion, but a closer relationship...