## POTASSIUM IN CELLS.

the rôle or rôles played by the element in living matter. This can only be done when the range of forms examined for this purpose is much more extensive than I have employed to this end, and when the cells of all types, and showing all species of activity, have been carefully studied with the aid of this method.

It is, nevertheless, possible now to discuss certain general features which the results already obtained make manifest, and it is also of advantage to do so, in order to indicate the lines which further investigation must take.

There is, first of all, no difficulty regarding the potassium salts of impregnation, and especially in those cases where the material affected is inert. This is a pur-ly physical phenomenon in which vital processes play no part, except when the inert material is situated in, and surrounded by, cytoplasm. Then the potassium present represents a portion of that excreted or disposed of by the active living matter.

There is, further, little difficulty regarding the potassium of precipitation. Its abundance in the cells of vegetable forms, whose media are rich in salts of the element, or in whose transpiration currents they are present in considerable quantities, makes it apparent, as previously indicated, that this is a method which living matter has of disposing of the puantity of potassium in excess of what it requires for its functions. It is, as already pointed out, very difficult to distinguish in some cases between a predictate and a condensation, that is, a quantity of potassium salt concentrated at a point in the cytoplasm to assist the metabolic functions of living matter. There are, however, enough facts regarding the latter condition alone which enable us, in discussing the rôle of potassium, to eliminate the processes due to precipitation.

It may also be regarded as certain that potassium does not subserve either the generation or conduction of nerve impulses. If potassium is so employed it must be in amounts infinitesimal, or so minute, that they are beyond the limit of detection by a reagent and a method sensitive enough to precipitate 99 per cent, at least or the potassium in solution. Such infinitesimal amounts of potassium would, in ordinary quantitative chemical analysis, be either unweighable, or, if within the limits of the ponderable, be ascribed to impurities derived from the adventitious tissue elements quite, or practically, inseparable from nerve cells and axons. To postulate such an attenuated dilution of the potassium ions as serving, for example, for the conduction of nerve impulses along an axon, is to make it open to question whether we can derive much