

n compounds
te frequently,

tin begins to
bution of the
ented in Fig.
een formed.
the nuclear
nucleus, but
no oxyphile
l under the
s they occur
he cell body
ess are still

come older,
i disappears
lacc. Syn-
for toluidin
17). With
may be de-
correspond
al granular
e, but the
he red and

bstance in
nce in the
clear chro-
f the chro-
nately the
cells from
oxyphile
in iron.

a 32mm.
ass filling
e at this
now the
s like the

These facts indicate that the three nuclein compounds of the adult nerve cell, the Nissl granules, the nucleolus and the oxyphile nuclear substance, are derived from the chromatin of the nucleus of the germinating cell. This chromatin divides into two parts, each containing iron and phosphorus, but the one is oxyphile and remains in the nucleus, while the other is basophile and diffuses into the cell body and becomes the Nissl granules. The nucleolus seems to correspond in character to the chromatin of such a stage as is represented in Fig. 15, where little change has occurred from the equatorial-plate phase.

The cell body is filled with diffused chromatin before the protoplasmic processes are formed, but as the cell grows and the protoplasmic processes arise, the diffused chromatin is formed into masses and these in turn into smaller pieces until the size observed in the adult is reached. The breaking up of the diffused chromatin into masses is probably due to growth, and not to functional activity as one might think from the results obtained by Vas and Eve, for the ganglion cells of the retina of a foetal calf of 60 cm. were distinctly granular. If the process of fragmentation proceeds far enough, the masses will be isolated in the cell, but if not they will constitute a reticulum. No evidence was observed of a connection persisting between this diffused chromatin and the nucleus.

One criticism of the observations of His is necessary. His stage 4 in the development of the neuroblast should succeed his stage 5, for the description of the latter stage is of a cell in which the basophile substance has not yet diffused from the nucleus, while the description of the former stage is of a cell in which this diffusion has taken place. That such a mistake might arise is seen from the fact that the basophile substance is not distinct in the cell body for a long time after neuroblasts are formed and have migrated into the mantle layer. Thus germinating cells are found in all the stages from the earliest procured (7 mm.) to that in which the embryos are about 18mm. long, while neuroblasts of the type that His describes as developed are abundant in the mantle layer at 7mm. and continue to be so until the formation of neuroblasts ceases. The chromatic substance, however, is not abundant in the cell body till the embryo is about 15mm. long. Consequently the process of transformation and diffusion of the chromatin is going on while the embryo grows from at least 7mm. to 15mm. In an embryo of 15mm. there are still many neuroblasts in the mantle layer that have not a distinct colourable cone but only a thickened mass of basophile substance around the nuclear membrane.

A single section of an embryo pig from 15 to 18mm., since it contains