*Cocci* : spherical or spheroidal cells, which, according to their relative (not very well defined) sizes are spoken of as *Micro­cocci, Macrococci,* and perhaps *Monas* forms.

*Rods* or *rodlets∙.* slightly or more considerably elongated cells which are cylindrical, biscuit-shaped, or somewhat fusiform. The cylindrical forms are short, *i.e.,* only three or four times as long as broad *(Bacterium),* or longer *(Bacillus)* ; the biscuit-shaped ones are *Bacteria* in the early stages of divi- sion. *Clostridia,* &c., are spindle-shaped.

*Filaments (Leptothrix forms)* really consist of elongated cylindri­cal cells which remain united end to end after division, and they may break up later into elements such as those described above. Such filaments are not always of the same diameter throughout, and their segmentation varies considerably. They may be free, or attached at one (the “ basal ”) end. A distinction is made between *simple* fila­ments ( *e.g., Leptothrix)* and such as exhibit a false branch­ing *(e.g., Cladothrix).*

*Curved* and *spiral* forms. Any of the elongated forms described above may be curved, or sinuous, or twisted into a corkscrew- like spiral instead of straight. If the sinuosity is slight we have the *Vibrio* form; if pronounced, and the spiral wind­ing well marked, the forms are known as *Spirillum, Spirochæte,* &c. These and similar terms have been applied partly to individual cells, but more often to filaments con­sisting of several cells ; and much confusion has arisen from the difficulty of defining the terms themselves. Various observera have, moreover, described particular cases where the cells or cell-filaments exhibit irregularities of form ; such “ involution forms,” “torula forms,” &c., appear to bo fairly constant in some cases.

In addition to the above, however, certain Schizomycetes present aggregates in the form of plates, or solid or hollow and irregular

branched colonies. This may be due to the successive divisions occurring in two or three planes instead of only across the long axis *(Sarcina),* or to displacements of the cells after division (as in the zooglcea conditions, &c., see fig. 3).

*Growth and Division.—*Whatever the shape and size of the individual cell, cell-filament, or cell-colony, the immediate visible re­

sults of active nutrition

are elongation of the

cell and its division

into two equal halves,

across the long axis,

by the formation of a

septum, which either

splits at once or re­

mains intact for a

shorter or longer time. This process is then repeated, and so on. In the first case the separated cells assume the characters of the

parent-cell whose division gave rise to them ; in the second case they form filaments, or, if the further elon­gation and divisions

of the cells proceed in different direc­tions, plates or sphe­roidal or other­shaped colonies. It not unfrequently happens, however, that groups of cells break away from their former con­nexion as longer or shorter straight or curved filaments, or as solid masses. In

some filamentous forms this “ frag­mentation ” into multicellular pieces of equal length or nearly so is a nor­mal phenomenon, each partial fila­ment repeating the growth, division, and fragmentation as before *(cf.* figs. 15

and 16). Finally, such filaments may break up into their

individual cells, forming “bacilli,” “bacteria,” or “cocci” as the case may be. By these means hundreds of thousands of cells may be produced in a few hours, @@1 and, according to the

@@@1 Brefeld has observed that a bacterium may divide once every half hour, and its progeny repeat the process in the same time. One bacterium might thus produce in twenty-four hours a number of segments amounting to many millions of millions.