gards the part played by water seems very reasonable. We can readily conceive that it would be difficult for water, even under considerable pressure, to obtain access by means of fissures or otherwise through the solid crust of the earth to the smelted mass beneath. As previously remarked, it would be impossible for it to penetrate the highly heated rocks constituting the inner part of the earth's crust. But it would seem very possible, especially in those volcanoes situated on the coasts of continents, for water to obtain access to great depths in the craters and subterranean canals. As to the cause of the rise of lava in these, Naumann propounds the following theory:

"The solidified crust encloses the fluid interior of our planet, and at their junction the same solidifying process, by which the crust of the earth was formed, must still be going on. Because however imperceptible the radiation of the internal heat may now be, it still continually takes place although in a lesser degree; and it cannot be doubted that on the inner side of the earth's crust fluid matter is continually assuming the solid form. It is indeed the case that the greatest number of fluid bodies experience a diminution of their volume, and only a few of them, such as water and bismuth, expand, while solidifying, but we must reflect that the relations as to density of the bodies existing in the great depths of the earth where vulcanism has its seat, must be essentially different from those, which they possess on the surface, where we can experiment with them. The pressure of the superincumbent masses must compress the materials existing at these depths. But fluid bodies are gifted with a much greater degree of compressibility than solid bodies, and therefore it can easily happen, that the most and perhaps all fused material which solidifies on the inside of the earth's crust experiences in this solidification an increase in its volume. The unavoidable consequence of this can be no other than that during this slowly progressing solidification a diminution of the capacity of the earth's crust takes place, that consequently the the space enclosed by it and filled with fused material is contracted. The next consequence will be, that a part of the fluid material will be pressed up sometimes through one and sometimes through another volcanic canal, until the weight of the column of lava equalizes the pressure in the interior. In this way the first conditions are given by means of which volcanic eruptions become possible."* The objections to this theory lie in the following

* Lehrbuch I. 289.