diſcharged from the eyes, noſe, and ears, and that there is an in voluntary diſcharge of foeoes and urine, it may be reaſonably concluded that compreſſion oſ the brain is induced,

The cavity of the cranium, in the healthy and natural ſtate, is everywhere completely filled by the brain ; whatever therefore diminiſhes that cavity, will produce a compreſſion of the brain.

The cauſes producing ſuch a diminution may be of vari­ous kinds, as fracture and depreſſion of the bones of the cra­nium ; the forcible introduction of any extraneous body into the cavity of the cranium ; effuſion of blood, ſerum, pus, or any other matter ; the thickneſs of the bones of the cranium in certain diſeaſes, as in lues venerea, rickets, or ſpina ventoſa; or water collected in hydrocephalous caſes. The firſt ſet of cauſes ſhall be conſidered in their order. The four laſt mentioned belong to the province of the phyſician, and have been conſidered in a former part of this Work.

sect**. 1.** *Of Fracture and Depression of the Cranium produ­cing Compreſſion of the Brain.*

Fractures of the cranium have been differently diſtin­guiſhed by different authors ; but it ſeems ſufficient to di­vide them into thoſe attended with depreſſion, and thoſe which are not ſo.

In fracture and depreſſion of the cranium, the treatment ought to be,—to diſcover the ſituation and extent of the fracture ;—to obviate the effects of the injury done to the brain, by raiſing or removing all the depreſſed parts of the bone ;— to endeavour to complete the cure by proper dreſ­ſings, and attention to the after treatment.

When the teguments correſponding to the injury done to the bone are cut or lacerated, and, as is ſometimes the caſe, entirely removed, the ſtate of the fracture is immediately diſcovered ; but when the integuments of the ſkull remain en­tire, even though the general ſymptoms of fracture be pre­ſent, there is ſometimes much difficulty in aſcertaining it. When, however, any external injury appears, particularly **a** tumor from a recent contuſion, attended by the ſymptoms already deſcribed, there can be no doubt of the exiſtence of **a** fracture. But it ſometimes happens that compreſſion exiſts without the ſmalleſt appearance of tumor. In ſuch caſes, the whole head ought to be ſhaved, when an inflammatory ſpot may frequently be obſerved. Sometimes the place of the fracture has been diſcovered by the patient applying the hand frequently on or near ſome particular part of the head.

When the ſymptoms of a compreſſed brain are evidently marked, no time ought to be loſt in ſetting about an exa­mination of the ſtate of the cranium, wherever appearances point out, or even lead us to conjecture, in what part a frac­ture may be ſituated. For this purpoſe an inciſion is to be made upon the ſpot through the integuments to the ſurface of the bone, which muſt be ſufficiently expoſed to admit of **a** free examination.

Some authors have recommended a crucial inciſion; others **one** in form of the letter **T ;** while many adviſe a conſider­able part of the integuments to be entirely removed. But **as** it is more agreeable to the preſent mode of practice to save as much of the ſkin as poſſible, a ſimple inciſion is ge­nerally preferred, unleſs the fracture run in different direc­tions, and then the inciſion muſt vary accordingly. It will frequently happen, that a conſiderable part of the integu­ments muſt be ſeparated from the ſkull, in order to obtain a distinct view of the full extent of the fracture ; but no part **of** the integuments is to be entirely removed.

When blood-vessels of any conſiderable ſize are divided, either before or in time of the examination, they ought to be allowed to blood freely, as in no caſe whatever is the loſs of blood attended with more advantage than the preſent. When, however, it appears that the patient has loſt a ſuffi­cient quantity, the veſſels ought to be ſecured.

After the integuments have been divided, if the ſkull be found to be fractured and depreſſed, the nature of the caſe is rendered evident; but even where there is no external appear­ance of fracture, tumor, diſcoloration, or other injury, if the patient continue to labour under ſymptoms of a compreſſed brain, if the pericranium has been ſeparated from the bone, and eſpecially if the bone has loſt its natural appearance, and has acquired a pale white or duſky yellow hue, the trepan ought to be applied without heſitation at the place where theſe appearances mark the principal seat of the in­jury.

Again, although no mark either of fracture or of any diſeaſes underneath ſhould appear on the outer table of the bone, yet there is a poſſibility that the inner table may be fractured and depreſſed. This indeed is not a common oc­currence, but it happens probably more frequently than ſur­geons have been aware of ; and where it does happen, the in­jury done to the brain is as great, and attended with as much danger, as where the whole thickneſs of the bone is beat in. The application of the trepan is therefore neceſſary.

But if, after the application of the trepan, it happens that no mark of injury appears either in the outer or in­ner table in that part, or in the dura mater below it, and that the ſymptoms of a compreſſed brain ſtill continue, a fracture in ſome other part is to be ſuſpected ; or that kind of fracture termed by practitioners *counter fissure,* where the ſkull is fractured and ſometimes depreſſed on the oppoſite ſide to, or at a diſtance from, the part where the injury was received. This is fortunately not a very frequent occur­rence, and has even been doubted by ſome ; but different in­ſtances of it have, beyond all queſtion, been found. If therefore the operation of the trepan has been performed, and no fracture is diſcovered, no extravaſation appears on the ſurface of the brain ; and if blood letting and other means uſually employed do not remove the ſymptoms of compreſſion, the operator is to ſearch for a fracture on ſome other part. The whole head ſhould again be exami­ned with much accuracy ; and, by preſſing deliberately but firmly over every part of it, if the ſmalleſt degree of ſenſi­bility remains, the patient will ſhow ſigns of pain, either by moans or by raiſing his hands, when preſſure is made over the fractured part. In this way fractures have been fre­quently detected, which might otherwiſe have been con­cealed.

Having now conſidered every thing preparatory to the operation of the trepan, we ſhall next point out the means beſt adapted for the removal or elevation of a depreſſed por­tion of the bone.

The firſt thing to be done is, after ſhaving the head, to make an inciſion as deep as the bone, and directly upon the courſe of the fracture.

The patient ought to be laid on a table, with a mattress under him, while his head is placed upon a pillow, and ſe­cured by an aſſiſtant. When the extent of the fracture has been determined, and the bleeding from the inciſion stopped, the depreſſed bone is now to be elevated ; but pre­vious to this it is neceſſary to ſearch for detached pieces. Should any be found, they ought to be removed by a pair of forceps adapted to this purpoſe. By the ſame inſtrument any ſplinters of bone which may have been beaten in may be removed ; but when a part of the bone is beaten in be­yond the level of the reſt of the cranium, as much of the pe­ricranium is then to be removed by a raspatory, Plate CCCCLXXXVIII. fig. 21. as will allow the trephine, Plate CCCCLXXXVIII. fig. 22. to be applied; or, if the operator incline, for the sake of dispatch, he may uſe the trepan,