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MAILED SPLINTS FOR THE TREATMENT OF FRACTURES.

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I was first led to attempt an improvement in the structure of splints by a case of ununited fracture of the leg of five months' duration. A rude tin splint, but containing the germ of subsequent changes, effected a cure, the patient being permitted to walk with crutches during the whole period. Upwards of 30 years have since elapsed, and I now lay before your readers the improvements which time and experience have gradually suggested.*

In nature, we find that animals to whom bones are denied are provided with shells, and though this fact did not suggest the inventions I am about to describe, yet these may not inaptly be compared to the shell of the crustaceæ provided as a substitute for a bone, when that bone is fractured. I have called them mailed splints, from their general resemblance to mailed armour.† They are of tin-plate, hammered to adapt themselves very closely to the shape of the human frame, and are all hollow, so as to embrace from a-half to two-thirds of the circumference of the part to which they are applied. Owing to these advantages, and the attachment whenever necessary to adjoining parts, giving a more secure hold, and greater lever power at angles best suited for the purpose, the fractured bone may be steadily maintained in its position during the cure. Great or nearly perfect comfort is attainable, because the splints preserve their position on the injured limb almost independently of a roller; therefore bandaging to the extent of squeezing so as to give uneasiness, is not required. Comparative trials will speedily produce the conviction, that in cases of simple fracture, pain and suffering—when the first few days are past—arise from the splints in common use squeezing the bruised limb, and at the same time forcing the patient with a fractured leg or thigh to lie for weeks on one spot. In these fractures, my contrivances allow a considerable degree of locomotion; a patient having a broken leg, may in a few days turn from side to side, the limb being supported by the hands of another, and often at the end of a week is able to move about his apartment on crutches; a patient having a broken thigh, is soon able to shift from place to place in bed, or to sit upon its edge, his feet resting on the floor, and, if a young person, may be carried out of doors without the slightest injury.

Commencing with the forearm, A is the splint, which is applied to its palmar side. It is scolloped in the distal portion, to permit better adaptation to the shape of different sized forearms; besides, compound fractures often occur here, and the splint being wanting at this point, they are more open to inspection. Rotation, by which fractures are so often displaced, is prevented by the hand grasping the strong ribbon of tin-plate which slides on the two lateral wires; these are soldered at a short distance from the end of the splint, to avoid squeezing the wrist. A piece of cloth folded a few plies, in this, as in all other splints, forms the only padding. A short roller secures the arm to the splint; a second passes over the uppermost wire and underneath the hand, supporting it in its proper line with the forearm, and next surrounds both wires and the hand, making rotation impossible.

A certain degree of rigidity is necessary for a good splint; too much flexibility permits injurious compression, and too much firmness prevents the proper moulding of the splint to the thickness of the limb. Mere thickness of metal, however, is insufficient to give the rigidity required. For this purpose, the edges of the splints must be either hemmed, bound or wired. Hemming is turning over the edge on itself, making two plies; binding is embracing the edge in a little trough of tin-plate,

* I published an account of these inventions in the Edinburgh *Northern Journal of Medicine* for 1845. They were then more clumsy, but they contained the principles of the present.

† The word splint was formerly used for armour. In the ballad of Kinmont Willie, which relates his rescue from Carlisle Castle in the reign of Elizabeth, by Buccleugh and his men, we are told they had "splint on spauld," that is, armour on the shoulder.