tissue under the right ventricular band had disappeared and the tissue on the left side of the larynx was rather more shrunken (see Fig. 2). On phonation the right ventricular band makes a wide excursion and comes in contact with the left wall of the laryngeal cavity. Meanwhile the cushion of the epiglottis moves towards the back of the larynx, concealing the glottis almost completely (see Fig. 3). The vibration of this ventricular band is probably the source of the voice which, though somewhat rough, is loud enough for all ordinary purposes. The operation has not interfered at all with the act of deglutition, which is normal. The larynx has everywhere a healthy appearance. The patient's general condition is excellent, and he has a more healthy complexion than a year ago.

SCIENTIFIC SPLINTING.¹

BY EDWARD A. TRACY, M.D., BOSTON,
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THE splinting of broken bones dates back beyond the time of Hippocrates. Common-sense indicated its use, tested it, found it good and set its seal of approval upon it. The object of such splinting was to keep the broken limb straight and to protect it from injury while it "knit." To-day, experimental knowledge, gleaned from the kindred sciences of biology, pathology, histology and physiology, teaches that for the repair and regeneration of broken tissues rest is requisite—and that for the speedy and correct reuniting of broken bones fixation is needful. This very principle of fixation for fractures is to-day in jeopardy because of a fallacious method of fracture treatment in vogue, especially in the hospitals. I refer to the plaster-of-Paris bandage treatment. Unmodified, a more unscientific treatment for fractures was never exploited. Fixation was sought for by its use, but the fixation gotten was most imperfect. The firmness of the bandage outside the limb was mistakenly taken to represent the condition within. Numberless deformities have been caused by this plaster treatment—deformities that would not exist had the Hippocratic old-fashioned splinting been used. Fixation with plaster-of-Paris bandages, applied in the ordinary way, is a fallacy. How could it be otherwise? With the limb swathed in cotton-batting, itself compressible, with the subsidence of swelling that accompanies fractures, with the tissue atrophy that comes with the non-use of the limb, how can one rationally expect fixation? Should we not expect deformities after such treatment? That such occur even in the practice of surgeons recognized as skilful is not surprising. (See Burrill and Dwight's paper on the plaster-of-Paris treatment of compound fractures, published in the communications of the Massachusetts Medical Society, 1892.) The fact of non-fixation by plaster-of-Paris bandages ought to be universally recognized.

I have said that because of this fallacious plaster-of-Paris treatment the very principle of fixation for fractures was to-day in danger of being questioned. How else explain Champonière's attitude towards fixation, at the Moscow Congress? However, while modern science teaches that rest is necessary for the repair and regeneration of broken tissues, so long will fixation be deemed an essential of all fracture treat-

ment. How can this fixation best be obtained? By a scientific surgical splinting. The requirements of a scientific splinting are, that splints be moulded directly upon the parts treated, that they fit directly upon the skin without padding to destroy their immobilizing properties, that they permit of ready removal so that inspection of the parts may be easy, that they be resilient, and readily re-applied and re-adjusted to the limb, so that the subsidence of swelling and tissue atrophy do not impair their immobilization, and, finally, that they be permeable to the x-rays. Such a splinting is readily gotten by the practitioner intelligently using my wood-fibre splint material. Gummied felting, leather, gutta-percha can also be so used. My wood-fibre material is easily demonstrated superior to those materials, and is therefore advocated in preference to them; but any material that fulfils the requirements above given, of a scientific splinting, has my earnest advocacy. Plaster-of-Paris has not, except when used in the method advised by Roswell Park and Roberts—moulding removal splints on the parts. Theirs is the only scientific way of using plaster-of-Paris. Such plaster splints, however, have not the lightness, the resiliency, the toughness, the cleanliness nor durability of moulded wood-fibre splints.

To remind you of the adaptability of my wood-fibre to the various parts of the human frame, I present you four splint forms with brief remarks upon each: (1) wrist splint, (2) humeral splints, (3) thumb splint, (4) rib splint.

(1) *Splint for Wrist Fixation.*—This splint form is applicable to wrist injuries and in particular for the treatment of Colles's fracture. It is made of wood-fibre splint material, moulded over the dorsum of the forearm and hand in a semi-prone position, the hand in line with the forearm. It permits of an efficient treatment of Colles's fracture, that is, passive motion of the fingers from the first day, and, carefully, of the wrist from the fifth day. The splint is discarded generally on the twenty-first day. The efficiency of this treatment I have demonstrated, and am pleased to find that one text-book, Moullin's (translated by J. B. Hamilton), advocates it, Moullin's conclusions on the efficiency of the treatment being independent of my own. The splint form, however, is original. Such a splint compares favorably with the elaborate fencing and staging which we frequently see surrounding the arms of hospital patients perambulating Boston's streets. If such patients or the hospitals derived an income by letting space for advertising purposes on this constructional arm splinting, its use nowadays would be more comprehensible.

(2) *Humeral Splints.*—These are moulded upon the arm, and follow the directions given by Hamilton for moulding similar splints for fracture of the surgical neck of the humerus from leather. Hamilton taught and practised scientific splinting, and was ever averse to the use of plaster-of-Paris.

(3) *Thumb Splint.*—This is readily made by cutting a piece of my splint material and moulding it so as to enclose the thumb, the back of the hand and a portion of the palm, avoiding the cross-palm lines. It forms an efficient thumb splint. Its description was published in the *Boston Medical and Surgical Journal* April 12, 1894. I venture to bring it to your notice again, as I see by an article in the same journal since, one of our hospitals has been struggling with a tin thumb-splint. The age of tin splints is passed. The

¹ Read before the Surgical Section of the Suffolk District Medical Society, January 5, 1898.

fact that tin is not permeable to x-rays condemns its use for such purposes, as to-day we desire to know the position of bones shown through the splinting, not caring to depend upon a guess as to their condition.

(4) *Rib Splint*.—This splint is a very simple one and readily constructed. It should be moulded over the injured side of the chest from an appropriately shaped splint blank, and bandaged thereon with a swathe. This treatment for the ordinary case of fractured ribs seems a rational one. I do not understand how adhesive plaster or a simple swathe can protect the broken bones from external pressure that may occur at any time, and particularly when the patient sleeps. The rib-splint, however, spanning the weakness in the chest wall and resting on the secure foundation of the sound ribs, prevents undue pressure from reaching the point of fracture.

Medical Progress.

RECENT PROGRESS IN NEUROLOGY.

BY PHILIP COOMBS KNAPP, A.M., M.D.

SCIATICA.

BIRO¹ has studied a series of cases of sciatica with the object of making a more exact differential diagnosis between sciatic neuralgia, sciatic neuritis, and hysterical conditions. He believes that in the condition of the Achilles-tendon reflex may be found a distinctive diagnostic criterion between neuralgia and neuritis; every case in which this reflex is diminished or lost is to be regarded as a neuritis, provided, of course, that diseases of the joints and of the spinal cord itself be excluded. In 12 cases the Achilles-tendon reflex was diminished or lost, and in eight of these muscular atrophy was observed in the muscles supplied by the sciatic nerve, with qualitative changes in the electrical reactions, and, in one case, with actual reaction of degeneration. In neuritis the special painful points are often wanting, occurring in only 42 per cent. of the cases; in neuralgia they are found in 84 per cent. Other sensory disturbances are rare in neuralgia, but are noted in half the cases of neuritis. In some cases hysteria may resemble sciatica. In these cases the painful points are rare, there is no pain on passive movements, nor is there any pain on flexion of the extended leg on the trunk. There is often a striking disproportion between the disturbances of function or the patient's complaints and the objective signs. The symptoms may be inconstant, the pain shifting from one side to the other; hysteria also may affect young women, while sciatic neuralgia or neuritis is more common in men of middle age. Out of 156 cases, about seven per cent. were regarded as hysteria and fourteen per cent. as actual neuritis. He concludes with some remarks upon etiology, showing that hemorrhoids were a possible factor in only seven per cent. of the cases, trauma and parturition very rarely have any influence, and exposure to cold is of slight importance, as many cases occurring in the warm and dry season as in the cold and wet. Recurrences were noted in less than two per cent. of the cases. The diagnosis between hysteria and neuralgia or neuritis is of great importance in treatment, since in the former case the use of the leg is to be encour-

aged, while in neuralgia and neuritis motion must be restrained.

[Biro says nothing of the knee-jerk which is occasionally found diminished in cases of sciatic neuritis. It is a well-known fact that in the early stages of multiple neuritis and in mild cases of multiple neuritis the knee-jerk may be exaggerated or unaffected. It would not be strange, therefore, if in the early stages or in a mild case of sciatic neuritis the Achilles-tendon reflex were not affected. Biro's distinction, therefore, might be simply one showing the degree of neuritis, not a distinction between neuritis and neuralgia. In view of the pathological findings in cases of severe trigeminal neuralgia, it is a question whether there is not a neuritis as the pathological basis in every case of neuralgia. Gowers's claim that sciatica is a sciatic neuritis seems well founded. — REP.]

TORTICOLLIS.

Risien Russell² has published the report of an experimental investigation of the cervical and thoracic nerve roots in relation to the subject of wry-neck. In most cases excision of the spinal accessory nerve alone is of little avail, and the only surgical measure which offers a reasonable prospect of permanent relief is division of the posterior branches of the upper cervical spinal nerve roots. In order to determine just what the anatomical relations are between these nerve roots and the muscles, he conducted a series of experiments on monkeys. For the precise knowledge of the muscles innervated by any given nerve root we must refer to the original article, noting only that there is considerably more individual variation with regard to the nerve-root supply of the neck muscles than of those of the limbs. The practical application of his investigations, however, may be summed up briefly. In the commonest forms of torticollis, surgical treatment must be directed chiefly to the upper four cervical roots; if there be lateral inclination of the head, chiefly to the first and second, if the occiput be drawn backwards, chiefly to the third and fourth. The fifth and sixth roots are least of all likely to conduct impulses which may give rise to spasm, but even muscles supplied by the seventh and eighth roots may give rise to spasmodic movements of the head. When the scaleni are involved, as rarely happens, surgical interference is contra-indicated, for they are innervated in part from the upper dorsal roots, which also contain accelerator and augmentor fibres of the heart, so that section of these roots would have dangerous consequences. He thinks it improbable that, if the chief roots supplying a muscle be divided, and if another root send a few fibres to that muscle, the full force of the nervous discharge should reach the muscle by these few fibres and thus keep up the spasm, but there is a remarkable power of recovery after division of the nerve roots, which may be due to various causes.

Brissaud³ holds that there is a mental torticollis, where surgical interference is useless, citing, as an example, a case where the lightest application of the finger in steadying the head would check the spasm absolutely, simply an act of faith. Such cases are not uncommon. In less than three years he has seen 19 cases, due originally to some transitory cause, where the effect has persisted as an obstinate torticollis in neurasthenic and debilitated subjects. Occasionally

¹ Deutsche Zeitschrift für Nervenheilkunde, xi, 207, November, 1897.

² Brain, xx, 55, Spring and Summer, 1897.

³ Revue Neurologique, January 30, 1897.