mated their lay audience at about half a million. They had received only a handful of letters on the subject, and the overall impression from laymen was one of boredom.

Professor MERRILL was asked about the place of cinematography. He thought that there was still a place for both film and television. The former had certain advantages as regards definition, contrast, and colour reproduction, and also if the presentation was to be repeated many times or in places where only cinema projectors were available. On the other hand, television recordings were easier and more rapid to make and were immediately available for editing and showing. This was a further advantage for teachers who wished to improve their lecturing technique. The rehearsal of lectures could lead to greater conciseness and effectiveness.

Another questioner spoke of televised anatomy demonstrations in Dublin in 1956 by Professor A. K. Henry, and pointed out that the ability to show in rapid sequence cadaver, diagrams, and preserved specimens made the use of television particularly effective in this subject. He asked whether the use of colour would be an asset. Professor WARWICK replied that in his experience monochrome was sufficient for 70% of demonstrations. Professor MERRILL added that in America anatomy demonstrations on closed-circuit television were second in number only to those in pathology. Nevertheless, he felt that colour had the advantage of giving a sense of depth lacking in black-and-white.

Dr. ROGER MEYRICK (London) suggested that general practitioners might benefit more from watching a programme in a discussion group with a leader. Professor MERRILL replied that his work had been essentially with undergraduates, but that it was evident that an experienced teacher was more valuable than a complete range of expensive equipment.

NEW APPLIANCES

High Femoral Osteotomy with New Compression Plate

Mr. L. C. L. GONET, consultant orthopaedic surgeon, Putney Hospital, London S.W.15, writes: High femoral osteotomy is a well-established method in the treatment of osteoarthritis of the hip joint and sometimes for subcapital fractures of the neck of the femur. In the United Kingdom McMurray's osteotomy is commonly used for the abduction or valgus type, while on the Continent the name of Pauwels is associated with the adduction or varus procedure. In recent years compression fixation at the osteotomy site by one or other of these methods has found increasing favour. The two fragments are held more firmly together, thereby diminishing postoperative pain, allowing very early mobilization and weight-bearing, and thus reducing possible postoperative complications.

A compression plate should not only provide adequate compression and fixation between the two fragments, at least until the patient is weight-bearing, but should not be so rigid as to prevent the proper "bedding down" at the osteotomy site—for it is here that union occurs—nor so rigid as to hold the two fragments apart. It should not interfere with the reversal of the osteoarthritic process following osteotomy, but above all it should also be simple to insert with the minimum number of instruments, be cheap to produce, make *x*-ray control unnecessary, and its application should come within the scope of any surgeon, for only then can it be considered for universal application.

The purpose of this paper is to describe a new type of compression fixation plate which, I believe, not only meets with the above requirements but introduces a new principle in bone fixation. It has been successfully used in 69 cases, the results of which are discussed below.

Description.—The plate (Fig. 1) is a straight spline of one piece consisting of an arrowhead with a cutting edge and a flat base, a rounded nail portion, and a flat plate with a compression screw at the end, similar to that used in the Danis principle. The plate is made in three sizes to allow for latitude in the site of osteotomy.

Technique.—The osteotomy is performed at or above the lesser trochanter in the usual way, with or without *x*-ray control, and the lower fragment displaced medially just enough to allow the entrance of the arrow head. The plate on its introducer is then inserted up the medullary cavity of the proximal fragment in an inward and upward direction and at *right angles* to the shaft and hammered through the cortex of the upper femoral neck in the region of the digital fossa (Fig. 2). The plate on the introducer is then rotated through 90° and pulled down, when it will be felt to lock over the femoral neck and the plate will fit parallel with the shaft of the femur (Fig. 3). A transverse screw is inserted through the femoral shaft at the lowest slot in the plate and the compression screw is then turned clockwise (Fig. 4). Eight to ten full turns are enough to provide a compression force of from 45 to 50 lb.

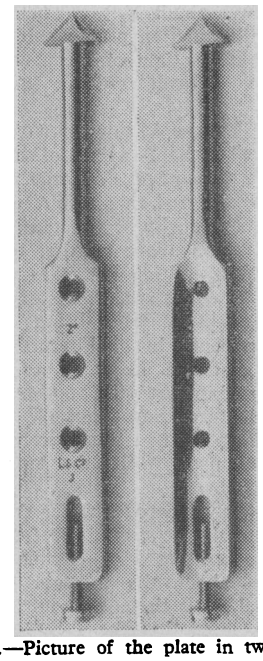

FIG. 1.—Picture of the plate in two views.

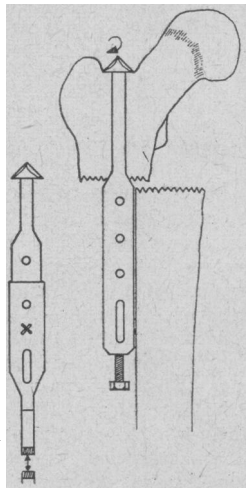

FIG. 2.—Diagrammatic representation of plate at right angles to the shaft.

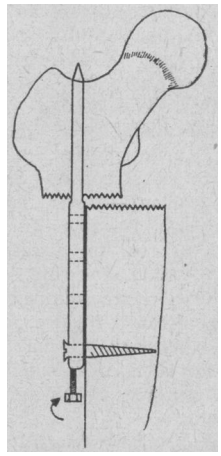

FIG. 3.—Diagrammatic representation of plate rotated through 90°. Compression not yet applied.

(20 to 23 kg.) as estimated in the Department of Clinical Measurement, Westminster Hospital, London. Three further transverse screws complete the fixation (Fig. 5). Tests carried out in the Department of Biomechanics at the Imperial College of Science and Technology, London, have confirmed the linear strength of the plate in conditions resembling surgery. The introducer and spanner are the only other instruments required.

Preoperative and Postoperative Treatment.—All patients are given preoperative crutch-training to gain confidence for what would be expected after the operation, and the post-operative plan is explained to them. A plaster boot with an outrigger is applied after operation to prevent external rotation for the first two days, and is bivalved the next day to allow for attention to the heel. It is then

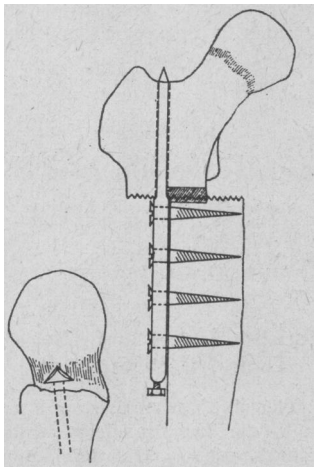

FIG. 4.—Diagrammatic representation of plate with compression applied.

applied only when the patient is in bed at night for the first five days. The patient sits out on the second day, and is allowed partial weight-bearing on crutches on the third day, going on rapidly to sticks, depending on the age and ability of the individual. Most patients by three to four weeks are self-supporting and can go up stairs.

RESULTS

Sixty-nine osteotomies have been performed. The criterion of assessment from excellent to good is based on the degree of reduction in pain and improvement in function, movement, and contracture (Van Nes, 1961). Three had had bilateral osteotomies from six weeks to 18 months after the first. Three patients have died from causes associated with their ages—79, 84, and 85 respectively. The results in nine patients between the ages of 47 and 60 can be regarded as excellent. The older age group from 61 to 87 had gross osteoarthritis of one or both hips. All these have been greatly improved with regard to both loss of pain and increased mobility. Even in gross cases the reversal of the osteoarthritic process could be seen radiologically. In one patient the compression-screw became detached 15 months later,

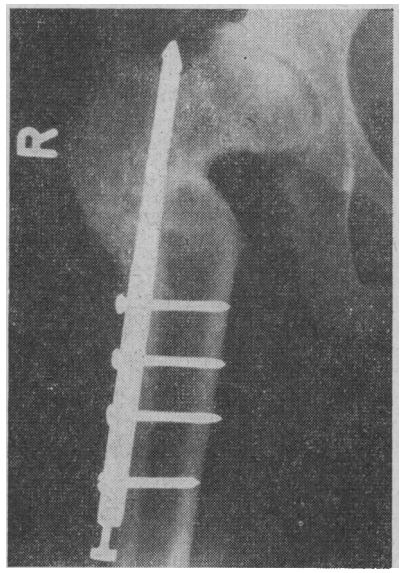

FIG. 5.—*X*-ray film showing anteroposterior view of completed compression plate fixation after 18 months.

but union was solid and the loose screw was easily removed. Three cases in this series showed a slight varus bend in the nail from 5 to 15°, but union was sound. In one case of a colleague, in which there were severe postoperative convulsions, the nail was bent to 60° and was later removed.

Nevertheless the overall figure of 93% excellent-to-good results compares favourably with Nissen's (1963) figures and those for Batchelor's (1963, 1966) varus osteotomy. Thus this operation almost guarantees improvement at the very least, a consideration which is often unappreciated by general practitioners, who should be made more aware of its benefits even in the chronic and very elderly.

DISCUSSION

The very early weight-bearing is in itself a help towards compression and bedding-down at the osteotomy site as the preloading compression force diminishes. Radiological union is often seen in four weeks. In some cases *x*-ray films four weeks to 22 months after operation show that the arrowhead has risen slightly above the femoral neck, and in two cases quite appreciably. Thus the possibility of cutting downwards is remote. It also demonstrates that the plate does not tend to hold the fragments apart, nor does it produce a valgus tilt. In fact a varus result predominates in this series, and this can be achieved by design at operation when it is more advantageous to centre the head of the femur in the acetabulum.

The upper part of the femoral neck has a good hard cortex, which slopes posteriorly. Penetration and locking of the arrowhead can therefore occur "high" or "low." An upward slant on introduction of the plate ensures a high position. In every new method attention to small details in operative technique is important if one hopes to attain the same results.

Rotation of the plate through 90° with a locking effect opens up a new technique, which can be applied to other procedures such as arthrodesis of the hip joint and compression fixation of oblique fractures of the long bones.

Subcapital Fractures of the Femoral Neck.—Two cases of old ununited subcapital fractures of the neck of the femur have been successfully treated by osteotomy after reduction and the use of this compression plate. One fresh subcapital fracture can be classed as an excellent result, and another as a good result so far. In those cases, however, while the patient can be got up on crutches, weight-bearing is delayed for four to six weeks unless a weight-relieving calliper is fitted.

No one method of carrying out compression osteotomy is wholly better than the other, but surgeons should have the choice of alternative procedures.

"There are many roads that lead to Rome."

I acknowledge with grateful thanks the help of Mr. I. McLeod-Balkie, of Epsom District Hospital, for allowing me to review his many cases, and other orthopaedic colleagues; the Department of Clinical Measurement, Westminster Hospital; the Department of Biomechanics at the Imperial College of Science and Technology, London; the London Splint Company, who developed the plate; and Smith Kline and French for a colour film of the technique at operation.

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