fellow. Bauzon felt a smart pain in the knee, and fell immediately on his face. On examination, the state of the part was found to be:—the lower limb was flexed at an angle with the thigh, so that the articular surface of the tibia was in contact with the inner surface of the patella, the anterior sub-cutaneous face of which was directed upwards and forwards; the condyles of the femur were easily felt in the poplitcal region which was very tense; pulsations of the poplitcal artery not so easily felt as generally stated, owing to its being contained in the inter-condylean furrow; triceps cruralis prominent; tendons of the crural muscles inserted on the tibia and fibula were stretched, and formed two slightly curved cords, the concavity looking upwards; limb mobile; flexion easily performed, and almost without pain; foot turned inwards or outwards, according to the position in which the limb was placed, the shortening not more than an inch; slight swelling on each side of the knee; very little pain; no ecchymosis; in all probability the only lesions were rupture of the crucial ligament, and some fibres of the gastrocnenii; all the tendons were uninjured. Reduction was easily effected by performing gentle and gradual extension on the leg, and without causing much pain. The only symptoms afterwards noticed were swelling of the knee, which soon disappeared, and pain in the sole of the foot, especially at its inner edge, and in the tendo Achillis, produced by the apparatus. Six weeks after the accident, the patient could move about without limping, except when fatigued; the knee was still weak, but not swollen. The patient was bled the day of the accident, and, after reduction, to subdue, or rather prevent the occurrence of inflammation; the apparatus was kept moist, first with Goulard water, and afterwards with camphorated spirits of wine. According to the author, this luxation was produced in the following manner:—When the body is thrown forwards, so as to cause the femur to form a right angle with the tibia, the inferior extremity of the anterior surface of the former presses on the upper edge of the patella, and as this bone reaches the anterior tuberosity of the tibia, it becomes firmly fixed. A lever of the first kind is thus obtained, the power being applied to the upper end of the femur; the fixed point being the patella, and the resistance being formed by the posterior ligament. When the power is sufficient to overcome the resistance, the condyles escape backwards in the ham, but not downwards, as shewn in the case just related. The editors of the *Archives* in recording this case, justly remark, that M. Velpeau, in stating that the leg might be bent so as to form a right angle with the thigh, without luxation taking place, spoke of extension alone; whereas, in Dr. Jacquet's case, two causes existed—first, forced extension; and secondly, the sudden shock produced by the falling of the body on the ground, and that by the union of these two causes, the luxation might easily be explained without having recourse to hypothesis.—*Archives de Medecine.*

CHEMISTRY, MATERIA MEDICA AND PHARMACY.

ANASTATIC PRINTING.

A recently invented process, termed anastatic printing, was made the subject of a lecture at the Royal Institution in Albemarle-street, London, on Friday, April 25, by Dr. Faraday. It is in many respects worthy of the attention of our chemical readers. When this discovery was first announced, and it was said that a means had been devised to copy from a printed page of any size, a line engraving, or any other print,—say, for instance, a page of the *Times* newspaper, upon a surface which would immediately furnish an impression—a perfect fac-simile of the former, the process requiring only a few minutes to complete; and that from the same surface many thousands of similar impressions might be taken, it was said that the thing was absurd! impossble! After the inventor had shown the possibility of these extraordinary achievements, by producing copies of engravings and printed sheets, the method by which it was accomplished was considered to be a profound mystery; even electricity requires a considerable time; but this process may be completed, and the copy exhibited, in a few minutes. Scarcely less marvellous than its results is the simplicity of the principles involved in the operation, and the small number of materials it requires. Everything depends upon the ingenuity of the inventors, who have studied and discovered new properties in water, oil, and gum arabic, which enable them to work these wonders. Dr. Faraday's exposition of the matter was as follows:—The printed page to be copied is laid upon blotting paper, and the reverse side is sponged over with very dilute nitric acid, so as to render the paper damp throughout; superfluous moisture is then removed by blotting paper, and the sheet is placed (the printed surface, to be copied, downward) upon a perfectly clean and polished zinc plate; a fold or two of bibulous paper is laid over it, and it is submitted to a careful, equable, and powerful pressure, by passing through rollers turned by means of levers. The effect of this is to moisten the zinc plate with the dilute acid, where the unprinted part of the paper comes into contact with it, and a slight corrosion or *biting in* is effected; at the same time the ink of the printed letters parts with a slight film, which is left on the zinc plate. This is technically termed *setting off*, and from this the process is designated *anastatic* printing. The success of the subsequent process depends upon two principles which Dr. Faraday says, have received some scientific elucidation very recently—namely, the *mutual* repulsion of oil and water, and the cohesion of the particles of fluids among themselves. This attraction of the particles of oil for oil, and water for water, is a far more energetic force than has been hitherto imagined. Upon the repulsion of dissimilar, and the mutual attraction of similar particles, anastatic printing depends. In illustration of the operation of these forces, together with the repulsion of water by polished metallic surfaces, a few simple experiments sufficed. Thus, water will run over a clean metallic plate, as tin or zinc, without wetting it. If a thin layer of water is laid over a surface,—such as a china plate for instance,—and a particle of oil is placed on it, the water will be repelled on all sides of the oil. In like manner, water will run off from an oiled surface without wetting it.

On the zinc plate, treated as described above, there are two kinds of surfaces,—one whereon the letters have left a film of oil—printer's ink being a mixture of oil and lamp-black—the other wetted with the dilute nitric acid. The next step is to rub printer's ink over the surface by means of a rag, and the operation requires no nicety or care, the ink will adhere only to the impression of the letters, not to the *wetted part* corresponding to the white unprinted part of the paper. Then, again, the whole is rubbed over with another rag wetted with water, holding in solution gum arabic, and what the inventors call *phosphatic acid*. This phosphatic acid is prepared by placing a stick of phosphorus in water in such a manner as to allow a portion of the stick to remain above the surface of the water exposed to a slow process of oxidisement in the air. The principle upon which the action of this solution depends is by no means obvious. The effect is, that the surface around and between the letters on the zinc plate becomes so wetted, that no ink will adhere to it, whatever may be the force with which it is applied. The addition of the smallest portion of gum arabic to water will cause it to wet surfaces of metal or other substances, over which it would otherwise pass without leaving the least trace of moisture.

The application of the solution of gum and phosphatic acid having been made, nothing more is necessary than to apply printer's ink to the zinc plate by means of a roller, as in lithography, and it will now print hundreds, nay, thousands of impressions so beautifully as fully to equal the original, and being so exact a fac-simile as to require the most nice observations by the experienced eye of a printer to distinguish from letter-press or copper-plate printing. The same rollers and machinery employed to take the impression upon the zinc plate suffice for printing the number of copies required. It is, however, found, that after a number of impressions have been taken, the letters begin to spread, the edges becoming blurred. In this case, all that is required to be done is to clean off all the ink from the plate by a rag, and it is found, that so permanent is the property imparted to the surface of the plate, that merely washing it over with the gum and phosphatic acid solution, the letters will again take up the ink from the rollers, and print again, with the edges as sharp and clearly defined as ever. Thus the renewal may be repeated, and the printing proceeded with, *ad infinitum*.

But there is still another highly ingenious device belonging to this process. When it is desired to copy print or engraving which is very old, and which, therefore, will not, by the above method, *set off*, the copy is placed in a weak solution of caustic potash, which pervades the paper, and softens the surface of the ink forming the letters; it is then dipped into a solution of tartaric acid, which, combining with the potash in the texture of the paper, forms bitartrate of potash, an insoluble salt, which remains in