

nately is by anatomical proof of the region affected, it is yet of undeniable importance. A man aged sixty-three complained of affection of sight, which followed an apoplectic seizure. Right-sided hemiplegia was present at first, but nine months afterwards had lessened to a trifling weakness in the arm and leg, without loss of sensibility. Examination of the eyes showed that the ophthalmoscopic appearances were normal, and the acuity of vision unimpaired, excepting trifling presbyopia; slight weakness of the right superior rectus existed, with corresponding diplopia above the horizontal plane. Since he complained of imperfect sight, even when the right eye was closed, the fields of vision were examined. On testing with a white object no defect could be discovered, even with a test object of very small size. When, however, coloured tests were substituted, there was found to be a typical left-sided hemiopia for all colours; the loss began exactly at the vertical middle line. In the right half of each field every colour was seen, even in the smallest area, well up to the periphery; in the left half no colour could be recognized, even in a large area, each appearing to be a dull gray. The same result was obtained on testing in the dark with lights tinted by passing through coloured glasses. Under treatment the paralysis of the superior rectus passed away; the paresis of the limbs and the affection of sight remained exactly the same. Four years later the patient died, after a fresh attack of apoplexy, but unfortunately no post-mortem examination could be secured.

Although no case equally clear has hitherto been recorded, facts pointing in the same direction have been observed by Treitel. The clinical evidence must thus be considered conclusive that there exists in the cerebral hemisphere a centre for colour-vision so independent of that for white light that it is capable of separate damage from acute lesion.—*Lancet*, Nov. 26, 1881.

Transplantation of the Medulla of Bone.

Prof. BRUNS, of Tübingen, reports in the *Archiv für Klin. Chir.*, Band xxvi. Heft 3, the results of some experiments he has lately made on animals, with the object of determining whether portions of transplanted bone-marrow can give rise to the formation of deposits of true osseous structure. An osteogenetic function of marrow, though indicated by the existence of an internal as well as of an external mass of callus after fracture, has been denied by many pathologists, and especially by Lebert, who held that the internal callus is only a displaced portion of the callus formed by the periosteum. It has been held also by Maas and many others, that the marrow and medullary membrane can only absorb and never form bone. The only cases in which any bone-producing action on the part of marrow can be proved in the human subject, are pathological instances of intramedullary deposition of bone without fracture, and without any coexistent formations of bone externally. Werner, by administering phosphorus with food, succeeded, even in full-grown animals, in bringing about almost complete ossification of the medullary cavity of long bones; and similar results have been attained by Busch through injections of mercury in small quantity into the arteria nutritia. That this internal formation of new osseous tissue in a long bone may be due to the action of specific stimuli, as well as to that of irritating agents introduced from without, may be proved by specimens of so-called osteosclerosis, in which disease the whole of the medullary cavity is often occupied by a very hard ivory-like substance. In order to decide whether or not this proved osteogenetic action of marrow be of a strictly pathological character, and analogous to the rarely observed ossification of muscular and testicular structures, Dr. Bruns instituted an extensive series of experiments. It was proposed to settle this

question in the same way that the bone-forming capability of periosteum had been proved, namely, by transplantation. Experiments of this kind had, however, been previously made, first by Ollier and Maas, who obtained but negative results, next by Goujon, and afterwards by Backow, both of whom seem to have had some success. In Bruns's first series of experiments, performed in sixty instances on rabbits and fowls, and in six instances on young dogs, and in which the marrow was always transferred from one animal to another, there was invariably failure. In a second series of experiments on nineteen animals, in each of which experiments the transplantation was made on one and the same animal, deposits of true bone were found in twelve instances. Professor Bruns states that the animals that are best suited for experiments of this kind are young dogs. A portion of the shaft of the femur or tibia is resected, and the marrow contained in this resected fragment is removed in an unbroken cylinder. Portions of this cylinder are then inserted into fresh wounds on the breast or back of the same animal, either into the subcutaneous fat or in a superficial part of the muscular layer. The wounds are then carefully closed by means of sutures. The following changes, it is stated, take place in each instance of successful transplantation. A diffuse swelling is at once formed, which speedily begins to diminish, and is replaced about the fourteenth day by a movable nodule, in which bony tissue already exists in scattered foci. By the twenty-fourth day, these foci have usually amalgamated into a single piece of bone. Microscopical examination proves that the nodule, in its early stage, is composed of osteoid tissue, cartilage, and newly formed osseous tissue, and that the fully developed hard mass consists of true bone.

These experiments, Professor Bruns asserts, prove that bone-marrow, completely separated from its connection with bone, and transplanted under the skin of the same animal, at a remote part of the body, may give rise to the formation of bone and cartilage. The swelling at the seat of transplantation ossifies in part directly, and in part by the conversion of cartilage and osteoid tissue into hard bone. The same process takes place in the formation of both the inner and the outer callus after fracture; and it may be assumed that bone is formed from the medulla in a way similar to that in which it is formed from the inner surface of the periosteum. It is held by Professor Bruns that in each instance the osteogenetic function is due to the same elements, namely, to osteo-blasts, which exist in the inner periosteal layer, and are scattered amongst the elements of bone-marrow, particularly in young animals. Professor Waldeyer, of Strasburg, who has examined these specimens, agrees in the view of the part played by the osteo-blasts in the ossification of marrow, and is not disposed to admit any participation in this process of leucocytes of the marrow, wandering leucocytes from the blood, metamorphosed fat-cells, or newly formed spindle-shaped connective tissue-cells. *London Medical Record*, Oct. 15, 1881.

Dr. TH. KÖLLIKER (*Cbl. f. Chirurgie*, 1881, No. 37), attracted by the report of Bruns on the transplantation of marrow, has made some experiments in this direction. He employed half-grown rabbits for his experiments, all the transplantations being made upon one and the same animal. Unlike Bruns, Kölliker transferred marrow, not to the skin, but to the anterior chamber of the eye and to the abdominal cavity. Transplantation of marrow to the anterior chamber of the eye was accomplished in the following manner: The tibia of another animal was trephined, a cylinder of marrow removed, and this was thrust into the anterior chamber by means of a small instrument similar to the Dittel's *porte-reinçole*. For transplantation into the abdominal cavity exarticulation of the knee-joint was practised, and the entire cylinder of marrow from the diaphysis of the tibia was placed in the abdominal cavity. After several failures—

partly on account of defective procedure, partly on account of too brief time of observation—Kölliker succeeded in producing both cartilage- and bone-formation from the transplanted portions of marrow. Kölliker can therefore confirm Bruns's assertion that marrow entirely removed from its connection with bone, and, in the same animal, transplanted to a distant part of the body under the skin, forms cartilage and bone, adding thereto the anterior chamber of the eye and the abdomen.—*Philadelphia Medical Times*, Nov. 19, 1881.

Polyuria.

MM. R. MOUTARD-MARTIN and CHARLES RICHTER have contributed several facts on the artificial production of polyuria, relating particularly to the substances which, when introduced into the circulation, increase the elimination of water and of urea by the kidneys.

Their method of procedure is very simple: a cannula is inserted in each ureter and the two connected by a T tube, from which the urine is allowed to fall, drop by drop. In a dog of medium size, about three drops will fall in each minute; when the number of drops reaches five or six in a minute, polyuria is evidently present. It is necessary to wait about an hour after the operation for the abdominal traumatism to pass off, when the secretion takes place in a perfectly regular manner.

Pure water, injected into the blood, instead of accelerating the secretion, retards it, and even in small quantities may cause almost an entire suspension of renal secretion. As, for example, in a dog of ten kilogrammes weight, 300 grammes of warm distilled water arrested the secretion, and an injection into a vein of even 50 grammes served to retard it. On the other hand, saccharine solutions enormously increased the elimination of urine. Even an injection of 10 grammes of sugar produced immediately both polyuria and glycosuria; the urine became limpid, transparent, and very light coloured; it contained very large quantities of sugar, but neither albumen nor blood, although after the injection of large quantities of water, both the latter are to be found. If the quantity of sugar injected is considerable, the polyuria becomes very strongly marked, the elimination of water reaching as high as forty times the normal amount.

Large doses of sugar also increased the amount of the other secretions, particularly that of the intestines, in which large quantities of sugar were also found. Water alone, on the other hand, in no instance increased the intestinal activity, whatever the quantity injected. These facts can evidently be attributed to the high osmotic properties of sugar. All the sugars have the same action; dextrose, however, passes with greater difficulty, but it is capable of passing off through the kidneys, and when injected into the circulation, causes polyuria.

All the substances which can pass into the urine, when injected into the blood, can cause polyuria, as instanced by chloride of sodium, urea, glycerine, and soluble phosphates. These substances cause diuresis, and the diuresis coincides with the elimination. When polyuria is due to alteration in the composition of the blood, it may be attributed to the presence in the blood of substances which the kidneys should eliminate, an elimination which cannot take place without an accompanying removal of fluid. The kidney then should be regarded as the regulator of the concentration of the blood, and polyuria as the result of a too great concentration of a dialysable substance in the blood, the different conditions of pressure and innervation being excepted.—*Revue Scientifique*, Oct. 1, 1881.