this large volume, comprising a collection of facts not known and not accessible to many readers. Consequently, there is much to repay perusal; but the reader instructed at all in the matters treated of will soon perceive that it is very much the composition of a special pleader, who will only see one side, who raises doubts and difficulties which have been disposed of aforetime, or have no actual existence, who withholds facts and arguments that may be advanced against him, and uses hypotheses and speculations to serve his purpose as if they were demonstrated verities.

Frey on the Microscope.—This is a translation of one of the best and newest Continental treatises on the microscope and its use in investigating the various tissues and parts of the body in their normal and in pathological conditions. The first section is devoted to the theory of the microscope. The theory of the magnifying lens, the simple microscope, the compound microscope, the cause and correction of spherical and chromatic aberration, are explained, together with the employment and uses of the different parts of the compound microscope, and the section concludes with a notice of some of the instruments of the best makers, e.g. Merz, of Munich; Nachet and Chevalier, of Paris; Zeiss, of Jena; Oberhauser and Hartnack, and Smith and Beck of London. With regard to the large instrument of the last-named makers, the author finds that its great advantage over Oberhauser's large instrument is that the stage permits of the introduction of a perfected condenser. In other respects it is, as judged by a Continental standard, too complicated. The second section is on apparatus for measuring and drawing, and touches at some length on micro-photography; the third treats of the binocular stereoscopic and polarizing microscope. With regard to the value of the stereoscopic microscope, the author is of opinion that by many it has been over-estimated. The future can only decide whether science is to derive real benefit from it. The fourth section, on testing the microscope, completes that portion of the work which chiefly refers to the instrument proper, as distinguished from its uses and discoveries. Then follow sections on the use of the microscope, microscopic examination, the preparation of microscopic objects, on fluid media and chemical reagents, on methods of staining, impregnation with metals, the drying and freezing processes, on mounting and injecting. The section on injecting appears to us particularly good, but all these chapters are full of practical directions and information which cannot fail to be of the greatest value to the worker.

From the eleventh section to the end, inclusive—a space of between four and five hundred pages—is allotted to the description of the

1 The Microscope and Microscopical Technology. A Text Book for Physicians and Students. By Dr. Heinrich Frey, Professor of Medicine in Zurich, Switzerland. Translated from the German and Edited by George Cutler, M.D. New York, 1872. Pp. 658.
microscopy of the tissues, fluids, and organs of the body in health and disease. We know of no more complete and valuable guide to the practical histologist. The book is not a mere descriptive microscopic anatomy, but rather a guide to the investigation of the tissues and fluids. It bears the same relation to an ordinary work on histology that a "dissector" bears to a descriptive anatomy book. For instance, take the eleventh section, on blood, lymph, mucus, and pus. The author first tells how blood is to be obtained and examined; how it is best diluted; the appearance of the corpuscles; then how the movements and changes in the living colourless cells may be brought into view by the means of the warm stage and iodine serum; how the colourless cells may be stuffed (gefüttert) by injecting granulated colouring materials for several days into one of the large lymph spaces which lie under the skin of the frog; the mode of numerically estimating the number of the two kinds of cells; then of the plasma of the blood and the pathological changes in the blood. On this last-mentioned point we may observe that Dr. Frey does not attribute much value to the endosmotic changes in the form of blood-cells which have been described in processes of disease. The two pathological conditions on which the microscope has hitherto thrown valuable light are those of leucæmia and melænaemia. Of the latter condition he writes:

"In malignant forms of intermittent fever the enlarged spleen has been seen to have a blackish appearance. The microscope shows as a cause of this change of colour, granulated lymphoid cells, often of a considerable extent, and which contain within them granules of the black pigment. Passing out through the splenic vein, they become mixed with the blood, and are seen in this fluid when it is subjected to microscopic examination. In consequence of their size they produce obstructions in certain capillary districts, especially in the brain and liver" (p. 233).

Then the author gives the mode of repeating Recklinghausen's discovery of the transformation of lymphoid cells into red corpuscles in the blood of the frog. The effect of electricity, heat, and chemical reagents on the blood-corpuscles are next given, the mode of obtaining hæmatocrystalline, hæmatin, hæmin, and hæmatoidin, and the portion of the section devoted to the blood concludes with the discussion of the movement of the blood in the living animal. The process of "stuffing" the lymphoid cells in the frog, to which we have alluded, was used by Cohnheim to establish the transmigration of those cells through the capillary walls and the fact that pus-cells come from the blood-vessels, for if a finely granular colouring material has been previously injected into one of the lymph-sacs of the animal a part of the pus-cells found on the surface of the mesentery (inflamed by exposure to the air) will be found to contain colouring matter. The lymphoid cells during health also migrate and appear as movable
cells wandering through the spaces in the connective tissue. The questions remain yet to be answered whether all migratory cells and pus-corpuscles originate in the blood, whether the cellular elements of connective tissue may be changed into pus, and whether the emigrants may not be transformed into other tissue elements. The latter, Dr. Frey thinks, is not to be doubted. Observers have affirmed the division of the lymphoid cells as well as their origin from the cells of the connective tissue.

This section, which we have chosen as giving a fair idea of the fulness of the range of the author's observations, concludes with an account of the microscopy of lymph, chyle, mucus, and pus. Pus-cells are the extravasated colourless blood-corpuscles which have collected at the point of irritation. But they are to be found at times inside epithelial cells, and the author gives an illustration of ciliated epithelium-cells containing pus-cells obtained from the respiratory mucous membrane. Remak, Buhl, and Rindfleisch assume that the pus-cells were formed in the interior of the epithelial cells. The author, however, inclines to the explanation that the included pus-cells are "those vagabonds of the body," the wandering cells which have penetrated from the tissue of the mucous membrane into the epithelial cells.

The remainder of the book the limitation of our space forbids us to analyse. Of the various sections, we may single out the one on the urinary organs as seeming to us—at least, as far as the anatomy of the kidney is concerned—especially full and valuable. The directions given for injecting and the admirable woodcuts of transverse and longitudinal sections seem to us admirably fitted to help the student. We may notice throughout that the work is profusely illustrated with clear and well-executed wood engravings, and that credit is generally given to the discoveries of English as well as Continental observers. The translation is avowedly a literal one. The translator, in his preface, apologises for the German character of the English text, but states that he found himself bound to a rigid adherence to the original by the nature of the subject, the minute descriptions, the frequent repetition of the same terms, and the impossibility of otherwise rendering justice to the author. We think, on the whole, that the work does Dr. Cutter great credit.

Fox on Ozone and Antozone.1—In this admirably finished work the author, whose name is already well known in the paths of both medicine and meteorology, has collected the scattered literature of a most interesting subject, and has systematised all that is at present known concerning ozone, and the still more mysterious antozone.

1 Ozone and Antozone, their History and Nature. When, where, why, how is Ozone observed in the Atmosphere? By CORNELIUS B. FOX, M.D. Edin., M.R.C.P. Lond., Fellow Brit. Meteor. Soc., Fellow Obstet. Soc., Member Scottish Meteor. Soc., &c. London, 1873. Pp. 329.