absorption band in the spectrum of highly dilute solutions of hæmoglobin and its derivatives, and I predicted that by removing the copper from turacin I should be able to obtain a turaco-porphyrin similar to the body which results from the removal of the iron from hæmatin. It was only after I had performed the experiments necessary for the elucidation of this point, and had obtained results corroborating Professor Church's discovery of turaco-porphyrin, that the fact of his having anticipated me in this matter was brought under my notice.

The results of my special work offer, however, an independent and additional confirmation of his results. I have found that when turacin is treated with strong sulphuric acid the resulting turaco-porphyrin presents in the extreme-violet an intense absorption band, which in position and characters is identical with that of hæmatoporphyrin, obtained by the action of concentrated sulphuric acid or pure hæmatin hydrochloride. In solutions of extreme dilution this band occupies the space between lines *h* and *H*. If the solution be slightly more concentrated *K* is absorbed, and with increasing concentration of the solution the absorption of the ultra-violet extends more and more.

Dr. Archibald Garrod and Mr. Gowland Hopkins, who first brought under my notice Professor Church's researches on turaco-porphyrin, have communicated to me the results of their own observations, which show that alkaline solutions of turaco-porphyrin exhibit, in respect to the absorption bands in the visible spectrum, slight differences from hæmatoporphyrin, though the identity of the spectrum of acid solutions of the two bodies is complete. The facts which I have placed on record in this paper point, however, to the essential identity of turaco-porphyrin and hæmatoporphyrin, and when taken in connexion with the identity of the ultra-violet spectrum of turacin, and of the acid hæmatin compounds, appear to me to establish that turacin contains the atomic group, which is the cause of the characteristic extreme violet and ultra-violet absorption exerted by hæmoglobin, its compounds, and principal derivatives.

St. Leonards-on-Sea.

Clinical Notes :

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

ON THE OCCURRENCE OF EXTERNAL HÆMORRHAGE IN ASSOCIATION WITH ECTOPIC PREGNANCY.

BY JAMES OLIVER, M.D. EDIN., F.L.S., F.R.S. EDIN.

A FECUNDATED ovum may develop in some structure in the pelvis outside the uterus and may even arrive at maturity without exciting during the recognised period of gestation—viz., nine months—any symptom different to that of an ordinary pregnancy, there being throughout this period complete amenorrhœa. External hæmorrhage is, however, so frequently observed in association with ectopic pregnancy, whether the ovum is enabled to complete its development or dies at a more or less early period of its existence, that it constitutes a common symptom of the disorder. When the impregnated ovum is lodged in the Fallopian tube the hæmorrhage may come either from the tube or from the uterus, and it is highly probable that in the majority of cases it proceeds from both situations. About the twentieth day after conception the chorionic villi begin to become vascular, but before this occurrence the presence of the segmenting ovum has so stimulated the structure harbouring it that the blood-vessels in and underlying the mucous lining of the Fallopian tube have begun to increase in size. As these vessels increase in size the tendency is for the unembedded portion of their walls to become more and more thin, and towards the ovarian and uterine poles of the ovum, where they are virtually unsupported, they rupture on the slightest provocation. The ovum is grasped by the tube, which encircles it like a belt, and at this level the maternal vessels are so supported that they seldom rupture spontaneously. The blood which flows from the neighbourhood of the ovarian pole of the ovum will, if unimpeded, be poured into the peritoneal cavity, whilst that proceeding from the uterine

pole will flow externally. When the blood is derived from the Fallopian tube it may make its appearance externally as early as the twentieth day after impregnation. During the evolution of an ectopic pregnancy the uterus usually becomes somewhat enlarged and membranous shreds or pieces are occasionally expelled from this organ. The extrusion of these membranous structures is generally accompanied by a greater or less amount of hæmorrhagic discharge which comes from ruptured vessels in the mucous lining of the uterus itself. As early as the tenth or twelfth weeks of an ectopic gestation these deciduous membranes may be expelled, but independently of their existence blood may be poured out by the vessels of the uterus as early as the sixth or seventh weeks. Correlatively with the increase in the size of the uterus the venous sinuses in the lining membrane of this organ become enlarged and, receiving no special support in consequence of the absence of any opposing structure in the cavity of the uterus, they tend readily to rupture.

Gordon-square, W.C.

A UNIQUE EXPERIENCE IN ETHER ADMINISTRATION.

BY R. W. CARTER, M.D. CALCUTTA.

ON June 16th, 1896, I administered ether to a patient for the operation of vaginal pan-hysterectomy. She was a strong, big woman aged fifty-four years, of moderately sober habits. The operation lasted one hour and forty-five minutes counting from the commencement of the administration, and the apparatus used was a Clover with Salamons ether. The patient was in Trendelenburg's position. Some slight erythema was visible over the neck and chest at the commencement of the administration, but it soon passed off. Her colour and pulse were good and there was but slight perspiration. Consciousness was restored about half an hour after she was put to bed. There was no vomiting for some time but some slight sickness later. The quantity of ether used in all was four ounces, and throughout the operation there were no untoward symptoms although bleeding was fairly free. I commenced giving two ounces of ether at 9.57 A.M. The patient was very violent, and as she would not take it quietly she was held down and the indicator quickly turned to 3, when she was completely subdued and anæsthetised in two and a half minutes from the commencement, the indicator being kept between 2 and 3 for a short time at the outset of the operation. At 10.13, sixteen minutes from the beginning, the residue of the fluid in the body of the inhaler looking milky, two ounces more of ether were added, and from that time till the completion of the operation (a space of one hour and twenty-nine minutes) no more was added; thus from 11 A.M. or earlier till 11.42 there could scarcely have been any ether—my conviction is that there was *none*,—yet during the whole of this time she was kept in an anæsthetic condition (or partially asphyxiated as some might wish to call it); at all events, she was as completely insensible to pain as if she were under the effects of ether or chloroform for an hour with merely taking in her own expired carbonic acid. It was interesting to watch her colour and pupils from the effects of applying and withdrawing the inhaler; in the first condition the pupils would gradually dilate, the colour of the cheeks and lips becoming darker, with slight frothing from the air passages, while on its removal a more normal state of things was restored. But she was not allowed to come out of her anæsthesia so long as the operation was going on. I knew I had no ether in the apparatus, and it occurred to me during the administration that could I continue to keep the patient anæsthetised in this way without the addition of ether it would be all the better for her afterwards, and her recovery to consciousness proved to be more satisfactory than if she had inhaled more ether. To make sure there was no ether remaining I poured the residue from the inhaler (which was under a drachm) into a glass measure and threw it on to the fire when there was not a trace of inflammable substance in it. When I removed the inhaler for washing out I could not detect the slightest smell of ether about it. In bringing this to notice it is in the hope that it will serve a useful purpose by showing how much more ether is frequently given than is necessary and what can be done without any at all after once subjecting the patient to its influence.

Weymouth.