centric *coagula*, and partly with hardened injection." Another case not dissimilar is given in a note.

The latter third of the volume consists of a catalogue of preparations illustrating the diseases of the bones contained in the Museum of the Royal College of Surgeons of Edinburgh; and the author properly remarks, that the value of this catalogue may be enhanced to the student by the consideration, that the greater part of it was prepared by the original collector, Mr Charles Bell of London.

The talent of the author for delineation and engraving is very happily applied in illustrating, in three good engravings, the principal morbid changes described in the volume.

In conclusion, though we find it impossible to agree with the views of the author on all the topics discussed in the present work, and therefore feel no difficulty in expressing our dissent, we admit that it possesses many good qualities, and is highly creditable to the diligence of the author. The subjects are investigated with attention, and in a manner which equally demonstrates reading and observation; and, if Mr Bell has not at all times arrived at pathological conclusions which are perfectly satisfactory, he has the merit at least of providing for the student a neat and succinct account of an important class of surgical diseases.

ART. V.—*A Treatise on the Nature and Cure of Intestinal Worms of the Human Body; arranged according to the Classification of Rudolphi and Bremser, and containing the most approved Methods of Treatment, as practised in this Country and on the Continent.* By WILLIAM RHIND, Surgeon, Member of the Royal Medical Society of Edinburgh. Illustrated by Six Plates. Highley, London; and Oliver and Boyd, Edinburgh. 8vo. Pp. 152. 1829.

THE subject of Helminthology has been hitherto much neglected in Britain. Between 1708, when Redi* first turned his attention specially to it, and 1819, when Rudolphi† and Bremser‡ perfected the system which is now generally adopted by naturalists as well as pathologists, many elaborate and learn-

* Redi. De Animalculis vivis quæ in Corporibus Animalium vivorum reperiuntur.

† Rudolphi. Entozoorum sive Vermium Intestinalium Historia Naturalis. Parisiis, 1810. Entozoorum Synopsis. Berolini, 1813 et 1819.

‡ Bremser. Ueber lebende Würmer in lebenden Menschen. Wien. 1819.

ed works have appeared on the Continent.* In this country the only author who has investigated the subject so minutely as to deserve mention with the continental writers is Dr Hooper, † who, however, has confined his attention to the external characters and anatomical structure of the five common intestinal worms, omitting those which occupy other parts of the human body, and passing over the more practical topics relative to their history, symptomatology, and method of cure.

The subsequent treatise of Dr Bradly being merely an abridgement of Dr Hooper's essay, with a few meagre directions as to the treatment, and the older work of Mr Chamberlain being intended merely to extol the virtues of the *Stizolobium* in *Tænia*,—Mr Rhind has stepped forward to fill up the manifest blank thus left in English medical literature. His work embraces the whole subject of Helminthology, so far as relates to the human species, namely, the origin and formation of worms; the external characters and anatomical structure of the genera and species which inhabit not only the intestines, but likewise the other organs and regions of the body; the symptoms they occasion; and the most approved methods of cure.

He commences by examining the question regarding the mode in which they are formed in the human body; and after stating the leading arguments in favour of their spontaneous formation, he concludes by adopting the opinion that they have their origin always in ova transmitted from one individual to another. It must be admitted that there are difficulties in the way of this theory which it is not easy to surmount. But the doctrine of spontaneous generation so evidently bears absurdity in the face of it, that we are surprised any person in modern times can attempt to uphold it, and much more that it should be adopted by so eminent a naturalist as Bremser. The actual propagation by Pallas of *tæniæ* in the abdominal cavity of a dog from ova taken from another dog, is positive proof of their possessing the power of reproduction; and this evidence cannot be overturned either by experiments which have yielded a contrary result, or by the difficulty of accounting for the transmission of the ova from one person to another.

* *Le Clerc*. *Historia Naturalis et Medica latorum lumbricorum intra hominem et alia animalia nascentium*. Geneva, 1715.

Fischer. *Commentat. Physico-Med. de Verm. in corpore humano*. Stadæ, 1751.

Bloch. *Abhandlung von der Erzeugung der Eingeweidewürmer*. Leipzig, 1787.

Zeder. *Naturgeschichte der Eingeweidewürmer*. Bamberg, 1803.

Brera. *Lezioni Medico-pratiche sopra i principali vermi del corpo umano vivente e le così dette mellatie verminose*. Crema, 1802.

† *Observations on Human Intestinal Worms, being an attempt at their arrangement into Classes, Genera, and Species*. In *Mem. of London Medical Society*, Vol. v. 1799.

In order that the ova may be developed, however, it is certain that a peculiar state of the system, and more especially a peculiar state of the intestinal canal are necessary; at least it is impossible to propagate them by ova in the healthy state of the intestines of an animal belonging to a species which is liable to them. Mr Rhind endeavours to fix what that peculiar state is, and describes it as consisting sometimes in the presence of an imperfectly digested food, sometimes in a superabundance of chylous matter, of good quality, but exceeding in quantity what the lacteals can remove. These statements do not rest on any satisfactory basis. It may admit of question whether the nature of the intestinal contents is not rather the effect than the cause of the presence of worms. The same uncertainty prevails as to the concurring circumstances which favour their developement by tending to bring on the peculiar state of the alimentary canal. Thus, in regard to diet, one author traces the prevalence of worms in Holland to a fish diet, another their frequency in Switzerland to a milk diet, a third their appearance among the negroes in the West Indies to too much saccharine food; Pallas says that they are most abundant among carnivorous animals; Bremser, on the other hand, found them to abound among granivorous animals; a very general opinion is, that an undue indulgence in raw vegetables and unripe fruits is also favourable to their production; and of late years it has been rendered probable that the want of a due quantity of salt has the same effect. If these statements are to be adopted as accurate, they will lead to the conclusion, that too simple a diet of any kind is favourable to the developement of worms, or else that the great predisposing cause is indigestion, howsoever induced.

In the succeeding part of his treatise Mr Rhind gives a succinct account of the external characters, anatomical structure, and habits of the several species of worms which have been found, either in the alimentary canal or in other organs of the human body. Of the first denomination six species are noticed, the *Trichocephalus dispar*, or long thread-worm of Hooper and Bradly,—the whip-worm of some German writers; the *Oxyuris vermicularis*, or thread-worm of the English authors; the *Oxyuris angulata*, a new species; the *Ascaris lumbricoides* or round-worm; the *Bothriocephalus latus* or broad tape-worm; and the *Tania solium* or common tape-worm. Of the second kind, or those which are found in other organs of the human body besides the intestinal canal, seven species are particularly mentioned, the *Filaria medinensis* or Guinea-worm; the *Hamularia subcompressa*, which has been found in the bronchial glands; the *Strongylus gygas* in the kidneys; the *Distoma hepaticum* in the liver and gall-bladder;

the *Polystoma pinguicola* in the fat near the ovary; *Cysticercus cellulosæ* in the intermuscular cellular tissue, and in the brain; and the *Echinococcus hominis*, the common hydatid. The names of seven other doubtful species are added from Bremser.

In his descriptions of the foregoing species, Mr Rhind first gives the generic and specific characters in Latin, as laid down by Rudolphi and Bremser, with a list of synonymes in various modern and ancient languages, and copious references to almost every esteemed author. He then relates succinctly the external appearance and anatomical structure of both sexes, the situations in the body where they are found, and whatever is known of their habits. This department of his treatise has been judiciously and correctly conducted, being comprehensive enough, and nevertheless without prolixity of detail. We have already hinted that he has introduced a new intestinal worm to the notice of the pathologist, namely the *Oxyuris angulata*. This worm was lately discovered to be a new species by Captain Brown, who found it in the museum of Dr Mackintosh of this city. It is so named from its body being bent at an obtuse angle. It is much larger than the common *Oxyuris* which inhabits the human rectum, being about two inches in length, and an eighth of an inch in diameter at its thickest part. "The body is one inch and an eighth in length, is bent in the form of a very obtuse angle, is thick, cylindrical, undulated, minutely striated transversely, and gradually tapers towards the head, which is somewhat obtuse, and terminated by a thick elevated ring, from the centre of which rises a truncated conical proboscis, with an extremely small punctiform mouth in its centre. The tail is about six-eighths of an inch in length, and bodkin-shaped, tapering very abruptly; is perfectly smooth, and about one-third the thickness of the body. The cuticle of this worm is so extremely pellucid, that the œsophagus and alimentary canal can be seen distinctly through it." P. 102. It bears some resemblance to the *Oxyuris curvula* described by Bremser, and found in the intestines of the horse.

In the next section Mr Rhind relates the symptoms which are caused by intestinal worms. This appears to us the only very imperfect part of his work. The whole section occupies only seven pages, in which are briefly mentioned the general symptoms referrible to the abdomen and head in ordinary cases, and the more violent abdominal and cephalic affections which in rarer cases have been attributed to the presence of worms. On these, the most purely practical points which he discusses in his treatise, he might have extended his observations with advantage both in the form of general comments, and in that of ac-

tual cases. The singular variety in the effects which the presence of worms in the alimentary canal has on special organs and on the general constitution,—on the one hand their occasional existence in considerable quantity without causing inconvenience, on the other their tendency to induce in different circumstances general fever, epilepsy, fatal coma, dangerous colic, perforation of the intestines, peritonitis, and so forth,—might have afforded room for many interesting details. We see no reason why he should follow Rudolphi and Bremser, and appear to doubt the possibility of worms perforating the alimentary canal; since satisfactory evidence has been adduced by various authors that perforation thus induced has caused fatal peritonitis, nay, that, owing to adhesion of the intestines to the abdominal parietes and the subsequent formation of an abscess, the worms have even been discharged outwardly.

The succeeding observations on the method of cure are more complete, and will be found by the practitioner to contain much valuable instruction. The treatment should be directed to two objects,—in the first place, to the destruction and expulsion of the worms; and subsequently to the removal of the state of the alimentary canal, which constitutes one of the chief accessory causes of their formation and continuance. For the first object the *Materia Medica* supplies the physician with an almost boundless variety of anthelmintics. In 1715 Le Clerc enumerated no fewer than 350 remedies of the kind, and even in 1826 Dr Wackenroder, the author of the Gottingen Prize Essay for that year, has thought it necessary to retain 100 vegetable anthelmintics, of many of which he has given an elaborate chemical analysis with a view to fix the nature of their active principles.* The extravagance of their number is a sufficient proof of the dubiousness of their claims to the title which their several proposers have assigned them. And accordingly the number in actual use, in this country at least, is exceedingly limited indeed. Mr Rhind cuts off from the list the whole tribe of mechanical anthelmintics, such as zinc, tin-powder, iron-filings, charcoal, stizolobium, and the like; notices very cursorily valerian, assafoetida, camphor, polypodium, and the various bitters which have been from time to time considered specifics; and follows the general opinion of recent practitioners in this country, as well as the wide experience of Bremser, by recommending almost entirely those remedies which have a cathartic action.

* Henr. Gul. Frid. Wackenroder, de Anthelminticis Regni Vegetabilis, respectu imprimis habito cum ad plantas a quibus ea desumenda tum ad partes constituentes, nominatim eas quibus earum vires ascribendæ sunt, commentatio, in certamine literario civium Academiae Georgiæ Augustæ, MDCCCXXVI. præmio regio ornata.

For the destruction and removal of the thread-worm and whip-worm, which inhabit chiefly the rectum and lower colon, he advises a compound electuary and powder extensively employed by Bremser, and indebted probably for their power to a considerable proportion of sulphate of soda and jalap. An injection containing half a drachm of aloes powder, or two drachms of oil of turpentine, is also an excellent adjunct when a course of laxatives has been continued for a few days. Injections of cold or even iced water have in similar circumstances a very beneficial effect, in consequence of the extreme sensibility of the worms to the operation of this agent. Oily injections serve to allay the irritation about the anus, which is often a very distressing concomitant of the presence of worms in the rectum. The plan followed by Bremser, and adopted by our author for the cure of the round-worm, is nearly the same as that mentioned above; but if turpentine is used, (and it is well known to be a very excellent remedy both for this species and for the *tænia*,) it must be given by the mouth. The best mode of preventing its action on the bladder is to combine it with other laxatives, particularly castor oil; and it is always proper to begin with small doses and increase them gradually, in order to ascertain what the patient can bear. It is well known that great constitutional differences have been remarked in this respect. The oil of Chabert, which has lately obtained much celebrity on the continent, and especially in Germany, and which is a compound of three parts of oil of turpentine and one of the empyreumatic oil of hartshorn distilled together, is believed by Mr Rhind to owe its efficacy entirely to the former ingredient. For the cure of the tape-worm, Bremser relies almost entirely on the oil of Chabert, in the same manner as in this country we trust chiefly to its most active ingredient the oil of turpentine; and he advises the physician to persevere in its use steadily for ten or twelve days at a time, and not to consider the cure as completed if any joints of the worm appear within three months after the remedy has been abandoned.

For correcting the morbid state of the intestinal canal after the expulsion of the worms, a tonic system of treatment is much insisted on by Bremser and his disciple Mr Rhind. A favourite tincture used by Bremser for this purpose is composed of one part of tincture of aloes, four of aromatic sulphuric acid, and eight of the tincture of the muriate of iron, of which mixture from ten to thirty drops are given thrice a-day in water, and still better in wine. The diet should be chiefly animal, and all raw vegetables, acid fruits, fatty matter, and fermented liquors are to be avoided as much as possible. Even leguminous and farinaceous food should be used sparingly. These precepts ap-

ply to the cases in which the digestion is feeble, and the chymous matter consequently both scanty and ill-conditioned. When, on the contrary, the tendency to worms is connected with a powerful digestion, or too abundant formation of nutritive matter, and a robust habit, the tonic plan in regard to diet is not called for, and the patient must be restricted both in the nutritiveness and quantity of his food.

The work concludes with an appendix illustrating the facility with which various terrestrial insects may live and even undergo their various metamorphoses within the human body. The following authentic case is an interesting addition to the instances of the kind previously recorded.

“ Robert Dixon, farm-servant, Markle, Haddingtonshire, was in the summer of 1826 engaged in driving lime to the fields, and was in the habit of frequently drinking from the ditches on the road side. In the end of the same year his disorder commenced with an increased desire for food, a vomiting of fetid slimy matter from his stomach, which made him cough, and with which he was attacked two or three times a-day. Nearly half a pint would come up at a time, accompanied with sour belchings and eructations, and a most obstinate state of bowels, five or six days sometimes intervening without a stool. He felt a swelling and fulness of the right inferior portion of the stomach, which was very painful when pressed. He slept very well, except on his right side, for when he attempted to lie on it, an almost continued working up of the slimy matter took place, which made him sit up and brought on cough. He continued in this state till June 1828, using a variety of medicines, and undergoing a variety of medical treatment, without any relief. On the 17th of June Mr Anderson was consulted, and ordered him a strong solution of carbonate of soda, and pills of calomel, hyoscyamus, and extract of gentian. On the second day after the exhibition of these medicines, in one of his severe fits of vomiting, he ejected from the stomach an animal of about four inches in length, which proved to be the common species of gray snail (*Limax major*.) It was quite lively and vigorous when voided, and lived in Mr Anderson's possession for five days afterwards. After this the patient's distressing symptoms disappeared, and he is now about to resume his usual occupation.” [October 10th.]

Mr Rhind's descriptions are illustrated by six lithographic plates, containing 86 characteristic figures by Captain Brown. The work appears on the whole to be a faithful digest of all which it is important for the practitioner to know on the subject of Human Helminthology. It has been executed with sufficient attention to anatomical and descriptive details, yet without an excess of scientific refinement and prolixity. So that we doubt not but it will prove popular and practically useful.