ers of astronomy and readers who desire a "non-mathematical treatment of the science of the stars."

The subject-matter of the book is very comprehensive and all fields of astronomy are touched upon. In general the author has preserved a good sense of balance and proportion and has not overemphasized certain fields at the expense of others. In the attempt to preserve the non-mathematical character of the book we find the descriptive method of presentation employed rather than the analytical. For the same reason, and also for the sake of brevity, the style of the text is rather dogmatic and in many cases simple proofs of statements are omitted.

The various controversial points in astronomy are well handled. All sides of the various questions are presented, in so far as space will permit, and the reader is left to draw his own conclusions from the material presented. In some cases Professor Fath does indicate the conclusions which he or others have reached, but he does not attempt to force these opinions upon the reader.

The physical make-up of the book itself is excellent. The binding is substantial and the paper of a quality capable of taking a good impression from the type and cuts, and also capable of withstanding the rough handling of the undergraduate. The type is clear and legible and the numerous cuts are admirably executed. Furthermore, the text is remarkably free from the annoyances of typographical errors which so frequently mar first editions.

After so much praise, a few words of criticism may not be out of place. In the attempt to avoid too lengthy a treatment for a first course some material has been omitted which will seem to many teachers as very important. The fields of spherical and practical astronomy have suffered the most severely. For example: the chapter on the celestial sphere, while it does contain all important definitions expressed very clearly, does not contain any reference to the simple methods for converting from one system of coordinates to another. The same criticism may also be applied to the excessively brief section on time. It also seems unfortunate that the fundamental problems of practical astronomy concerned with navigation should be merely mentioned in the introductory chapter and that no mention should be made of that important instrument, the sextant. Throughout the text dates are given and reference made to original discoverers, but little or no attempt is made to show the tremendous influence of astronomical discoveries on the history of civilization or upon the other sciences. Such material might well be substituted for the weak sections upon such subjects as the theory of relativity and atomic theory.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

THE CULTIVATION OF ENDAMOEBA HISTOLYTICA

IN an endeavor to simplify the culture medium of Boeck and Drbohlav[1] for the cultivation of *Endamoeba histolytica,* the cause of amoebic dysentery, which has proven so successful for that purpose, the following culture medium has been found even more successful, in that the amoebae live for a longer period of time in it and grow to a much greater size. It is a fluid medium, unlike all other media that have been proposed for the purpose, and possesses the advantages of markedly inhibiting bacterial growth, simplicity of preparation, and greatly facilitating researches on the effect of chemical agents upon the amoebae.

As used in this laboratory the medium is prepared as follows. The Locke solution used has the following formula:

Sodium chloride	9.00 gm.
Calcium chloride	0.24 gm.
Potassium chloride	0.42 gm.
Sodium bicarbonate	0.20 gm.
Dextrose	2.50 gm.
Distilled water	1000 cc.

This solution is filtered and autoclaved at fifteen pounds pressure for fifteen minutes, and allowed to cool. To it is then added one part of inactivated human, horse or rabbit blood serum to each seven parts of the Locke solution used. After adding the blood serum the whole is thoroughly shaken and filtered through a Mandler or Berkefeld filter. Sometimes it is necessary to filter through two or more candles before the filtrate is perfectly clear. After filtration the medium is tubed, placing 5 cc in each suitably sized test-tube, and incubated for twenty-four hours at 37° C. If found sterile the tubes should be kept in an incubator at 37° C. until used. The reaction of the medium does not need adjusting, as it is always favorable for the growth of the amoebae when first prepared. Inactivation of the blood serum is necessary and we have found that human blood serum gives the best results, with horse and rabbit serum followed in the order named.

The medium is inoculated by placing a loopful of the feces to be examined in the medium and breaking it up thoroughly with the inoculating loop. After inoculation the tubes are placed in an incubator at 37° C. for twenty-four hours and a small portion of the sediment at the bottom of the tube examined at the end of that time. The amoebae will always be found in the sediment, and usually occur in

[1] Boeck, W. C., and Drbohlav (1925), *Am. Jour. Hyg.,* V. 371.

large numbers in this medium if present in the feces. Transfers are made by removing a small portion of the sediment and transferring it to an uninoculated tube which should have been kept in the incubator at 37° C. Transfers are most successful if made every twenty-four or forty-eight hours, but successful transfers have been secured from an eight-day old culture, and motile amoebae have been found in cultures as old as eleven days. Transfers in this medium have been carried on in this laboratory for over two months and apparently may be continued indefinitely.

The excellent growth and reproduction of *Endamoeba histolytica* in this medium composed entirely of Locke's solution, slightly modified, and human, horse or rabbit inactivated blood serum, demonstrates that media containing a solid substratum containing egg albumen or blood is not essential for the cultivation of this species and that neither egg albumin nor blood is necessary as a part of the food supply of this amoeba, as stated by Kofoid and Wagener.[2] A more detailed description of our experience in the cultivation of *Endamoeba histolytica* in this medium, together with some account of the morphology and biology of the organism as observed under cultivation, will be published in the September number of the *American Journal of Tropical Medicine.*

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A RAPID METHOD FOR PREPARING THIN SECTIONS OF UNDECALCIFIED BONE

THE usual method of grinding slabs of bone between hones in order to prepare sections thin enough for microscopic examination is very laborious and requires more time than many workers are willing to devote to it. Equally satisfactory sections can be prepared with a great deal less labor and in a much shorter time by using files. It is possible to saw off and grind a radial slab 5 cm long or half of a transverse slab of ox femur within an hour.

Thin slabs of bone should be secured by sawing. Clamp a suitable piece of bone in a vice so that it projects 2 mm or 2.5 mm beyond the jaws. Avoid gripping it too tightly lest excessive strain cause microscopic cracks which will result in the section breaking up as it is ground thin. The jaws of the vice should be protected by straight-edged strips of metal to prevent damage by the saw. Saw off the slab with a hack saw, using the parallel edges of the metal guards as guides in order to secure a slab with parallel surfaces. With reasonable care a smooth slab about a millimeter in thickness should result. Rub one surface of the slab on a twelve or fourteen inch flat mill file to remove any roughness due to the sawing. Attach the partially smoothed surface to the metal face of an old half-tone plate of suitable dimensions. This can be done by heating the plate in a flame and rubbing a piece of hard paraffin over it, then pressing the slab of bone into the molten paraffin. It is best to press it in by holding some object with a flat surface against it in order to insure uniform pressure over the entire area. Chill the paraffin while the slab is still under pressure by dashing cold water over it. Trim away any excess of wax and rub the slab on the file, using the half-tone plate as a holder. When a perfectly plane surface has been produced, polish it by rubbing for a few minutes on a flat hone. A hone that has been rendered concave by sharpening microtome knives is useless until it has been resurfaced. Very critical workers may wish to impart an additional polish by rubbing on a glass plate with optician's polishing powder. Reverse the slab on the plate and rub the other surface on the file until it is thin enough over its entire area to permit of seeing the etching on the plate beneath it. Polish the second surface in the same manner as the first. Loosen the section with xylol and transfer to a dish of xylol to remove the wax. If dust adheres, transfer successively to alcohol and water and wash carefully with soap. If it be desired to entrap air in the spaces between the bone cells, allow the section to dry and mount directly in melted balsam. If fully cleared sections be desired, dehydrate, clear and mount in the usual manner. If several mounts are to be made from one section, fine scissors should be used.

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SPECIAL ARTICLES

NOTE ON ARTERIOSCLEROSIS IN RABBITS CAUSED BY SOME SAMPLES OF URANIUM NITRATE[1]

IN the course of some experiments that were being made to find whether or not the renal atrophy produced by uranium nitrate was accompanied by elevation of the blood pressure, there was found at autopsy in three rabbits which died in succession a severe arteriosclerosis of the aorta and of the peripheral vessels. In one animal the aorta appeared from the outside not unlike the trachea, this ring-like appearance extending into the carotids, subclavians, renals and iliacs, and even into the thyroid and para-

[2] Kofoid, C. A., and Wagener (1925), Univ. Cal. Pub. Zool., XXVIII, 136.

[1] From the H. K. Cushing Laboratory of Experimental Medicine, Western Reserve University, Cleveland, Ohio.