

At any rate, the clots which we find in ordinary *post mortem* examinations are more common and larger in these vessels, and in the right cavities of the heart, than in any other parts of the body. Frequently they are of firm consistence, while the blood in the veins, and in the left side of the heart, is quite fluid.

Virchow attributes the formation of these plugs in the pulmonary arteries to the lodgment there of small clots, or fragments of clots ("emboli") which have been formed in the veins, and have been wafted with the blood through the right cavities of the heart, towards the lungs. These fragments, he thinks, become detached from the ends of the clots which project into the great venous trunks; thus, in any case where the end of a clot, formed in one iliac vein, projected into the vena cava, a portion may be washed off by the blood flowing against it from the other iliac vein, and, being carried into the pulmonary artery, may lodge upon one of the projecting angles of the vessel, and constitute a nucleus for the formation of a plug. It is not improbable that this may sometimes occur. It must, however, be remembered that the surface of the venous clots is usually quite smooth, and therefore not very likely to be dismembered by the slowly flowing current of blood; secondly, that in many cases, as in No. I, II, III, there was no reason to suppose that the pulmonary clots were preceded by clots in the veins; and thirdly, the effects of a preternatural tendency of the venous blood to coagulate are, for the reasons just given, likely to be exhibited in the pulmonary arteries as well as in other parts of the system.

The pulmonary clots undergo the same changes as those in the veins, provided that the patient survives. They may soften (Cases III and v)* or become firmly adherent to the vessel and disappear, leaving scarcely a trace behind (as in Case VII); or be converted into threads or bands, stretching from one part of the tube to another. I do not know an instance in which they have caused obliteration of any of the pulmonary vessels; though it is probable that this may take place occasionally in the smaller branches.

The plugging in the pulmonary arteries does not appear so easily to induce inflammation on the exterior of the vessel as it does in the case of the veins of the limbs. It is not usually attended with pain or uneasiness, or any symptoms which lead, with certainty, to a diagnosis. Hurried, oppressed breathing, with faintness, occurring without any other obvious cause, would make us suspicious of this affection, and should induce us to auscultate in the situations in which a bruit, originating in the pulmonary arteries, would be most likely to be distinguished. I am not aware that a bruit, produced in this manner, has yet been recognised, though it probably would have been discovered had attention been directed to the point during the life of any of the patients.

It is indeed a remarkable feature in the affection that the pulmonary arteries, one or both, in the main trunks, or in the larger branches, may be blocked up to a considerable extent without causing any sign of obstruction to the circulation, or of affection of the lungs, or, indeed, without producing any symptom whatever. In Case VI, it was clear, from the size of its remains, that a clot must at some time have occupied nearly the entire calibre of the main trunk of each of the pulmonary arteries; yet there had been no symptom of such condition observed during the life of the patient. In Case I, the patient appeared to be in her usual health till the moment of the fatal seizure. In this, and other parallel cases that have been recorded, there can be no doubt that the clots were forming for some time before death, and that sufficient blood found its way by the side of them into the lungs to maintain the circulation and supply the wants of the system.

The sudden death is probably caused by a slight exertion following a period of repose. During the repose we may judge that the clots are increasing; and the ensuing exertion, by causing a greater demand for oxygenated blood than can be supplied through the impeded pulmonary vessels, induces fainting, which is fatal. The extreme suddenness of the fatal seizure in these cases has suggested the idea that it may have been caused by some displacement of the clots, producing more complete occlusion of the vessels; but this is opposed by the facts that the clots are usually more or less adherent to the walls of the vessels, and show no sign of such displacement having taken place.

[To be continued.]

* In the case related by Dr. Kidd, *loc. cit.*, one of the clots was softened in the middle, and the tissues around the artery, on one side, were condensed and indurated.

REMARKS ON THE INTENDED CHANGE OF THE WEIGHTS USED IN PHARMACY.

By G. E. PAGE, M.D., F.R.C.P., Cambridge.

It is generally understood that the Committee for the Preparation of a National *Pharmacopœia* have come to a resolution to make a complete change in the weights for pharmaceutical purposes. The avoirdupois pound and ounce are to be substituted for the troy pound and ounce, which have hitherto been used in apothecaries' weight; and a new drachm, a new scruple, and a new grain, are to be established.

The former of these changes is manifestly desirable. The avoirdupois pound has, by recent enactment, become the standard imperial weight; and the avoirdupois pound and ounce are those which have long been used in all mercantile transactions, except those of goldsmiths and jewellers. They are the weights which are used by manufacturing chemists, as by all other manufacturers; and their adoption for the dispensing of drugs would do away with the ambiguity and inconvenience arising out of the use of two different sets of weights by manufacturing and dispensing chemists.

The substitution, therefore, of the pound avoirdupois for the pound troy, may be hailed as a sensible improvement; and the corresponding change in the ounce might be allowed to pass unquestioned. But the change in the values of the drachm and scruple is less free from objection; and the establishment of a new grain appears to me to introduce inconveniences greater than those which it is intended to remove.

The object of the *Pharmacopœia* Committee, in proposing to establish a new grain, seems to be this: to make the avoirdupois ounce divisible into 480 *integral* parts, like the troy or apothecaries' ounce. The latter, as everybody knows, contains 480 standard grains. But the avoirdupois ounce contains only 437.5 standard grains; so that if this be divided, like the apothecaries' ounce, into drachms and scruples, each drachm will contain 54.6875 standard grains, and each scruple will contain 18.2291666... standard grains.

These, then, will be the actual weights of the proposed new drachm and scruple. But, in order to make the scruple contain 20 grains, the drachm 60, and the ounce 480 grains, as heretofore, the Committee propose to establish a *new* grain, which shall be lighter than the standard grain, in the proportion of 91 to 100.

To the establishment of this new grain there are objections which seem to me deserving of consideration. The present standard grain has been formally established by Act of Parliament, being defined as the seven-thousandth part of the standard pound deposited in the Exchequer Office. It is not only in actual use for medicines and the precious metals, and in scientific investigations, but has been in use for ages, and is known and understood both at home and in foreign countries as our standard grain. It will, of course, continue to be used by men of science in their experiments and calculations.

The establishment of a new grain to be used for drugs alone would have the effect of making diverse what is now common between medicine and other sciences. This will not be a mere temporary inconvenience; it will occasion an ever-recurring ambiguity. When we meet with statements of weight in grains in medical, physiological, or chemical investigations, we may be left in doubt which kind of grain is meant, the standard or the new grain; and this is a doubt which calculation will not solve.

Besides, for the honour of medicine, is it advisable to sever any of its bonds of connexion with the more exact sciences? Shall we not be blamed for it by men of science? and shall we not be liable to incur ridicule, if, while remedying the ambiguity of the pounds and ounces, we create ambiguities of the same kind and greater in degree?

It may be added, as a minor objection, that the new grain, if it be the four-hundred and eightieth part of an ounce avoirdupois, will not be .91 of standard grain, but the long recurring decimal .911458333... If the new grain be .91 standard grain, 480 new grains will not make exactly an ounce avoirdupois. The difference is unimportant in the dispensing of drugs, but not so in scientific investigations; and a *reform* involving such an error of calculation would do little credit to medical accuracy.

These are not the only objections to the proposed change. The new drachm and scruple will be different from the drachm and scruple heretofore used. The names will be preserved, but will not have the same meaning; and hence will arise further ambiguities or inaccuracies.

With regard to the drachm there will, moreover, be this strange inconsistency: it will be the eighth part of an ounce avoirdupois, and will therefore be exactly twice as heavy as another weight of the same name, viz., the drachm avoirdupois, which is the sixteenth part of the same ounce.

One of the immediate consequences of the proposed change will be, that an entirely new set of brass weights will be required by every general practitioner and druggist in the kingdom; all the old weights will become valueless.

Be it observed, that the inconveniences which have thus been pointed out are not the immediate consequence of the praiseworthy aim of the Committee to get rid of the confusion between the two ancient sets of weights—the troy and avoirdupois pounds and ounces; they are not the necessary consequence of substituting these avoirdupois weights for the corresponding troy weights, but are the consequence of an endeavour to effect the division of the ounce avoirdupois into 480 integral parts. It seems to me that this object is not of so essential an importance as to justify the introducing new elements of confusion into our English system of weights.

It may, perhaps, be worth while to point out a plan by which all these inconveniences might be avoided. This may be done simply by ceasing to use the ounce in prescriptions; of course, I mean the ounce in weight, not the fluid-ounce, which is a measure, and with which it is unnecessary to interfere. Let the quantities of solid substances be prescribed in drachms, scruples, and grains, such as are now in daily use. When larger quantities are required, they can be written in drachms; or, if of the largest kind, may be expressed by the pound of 7000 grains, which is an exact multiple of the drachm.

Perhaps a still better (and the simplest) plan would be, for all quantities less than a pound, to prescribe in grains alone—in standard grains alone. The calculations between large and small quantities would always be easy, because the standard pound is a large round number (7000) of grains. We should have weights of 100, 200, 500, and 1000 grains, such as are now occasionally used in scientific investigations. There would be no difficulty in writing our prescriptions. Five hundred grains (gr. ν) is as easily written as \mathfrak{z} . Fifty, or a hundred, or a thousand grains, are likewise easily written, either in the ordinary figures, or as gr. ι , gr. c , or gr. m .

As the grain would not be changed, all the brass weights now in use for dispensing might still be used. A single set of the small weights might be made to serve for dispensing any drug not exceeding 250 grains in weight. If any new weights were needed, they would be one of 300 grains, and one of 500 grains; and these would only be required in cases in which ounce weights are now used. No other weights would be needed for dispensing and compounding on a moderate scale; and if larger weights were needed, they would be the ordinary avoirdupois pound, half-pound, and quarter, which are in common use in every shop and most private houses, and which weigh respectively 7000, 3500, and 1750 grains.

As the intentions of the *Pharmacopœia* Committee have not yet been published on authority, my remarks may appear premature. But the intentions are well known; and to wait for their authoritative publication is to wait until it might be difficult or impracticable to have them reconsidered.

ILLUSTRATIONS OF THE USE OF THE OPHTHALMOSCOPE.

By WILLIAM MARTIN, F.R.C.S., late Professor of Ophthalmic Surgery in the Calcutta Medical College.

[Continued from page 598.]

CHOROID.

Congestion of the Choroid may be diagnosed by a hyperæmic state of the chorio-capillary layer. Choroidal inflammation, in various degrees, may then be expected to ensue, and to cause atrophy, maceration of the pigment, layers of exudation, etc. These again, would, in the end, bring on disorganisation of the retina.

In the first instance, we may find an unusually pale condition of the fundus. It does not light up well, and the appearance is rather of a pale orange-yellow than the natural bright pink colour. We shall be likely, also, to find some discoloration of the fundus; instead of a uniform field, we see pigmented patches in parts. If these appearances last long the disease progresses to disorganisation. The effects on vision will be more evident according as this disorganisation—whether it be maceration of the pigment, or anything else—affects the ma-

cula lutea, or its immediate vicinity. The yellowish tint of the fundus becomes of a paler hue. We see the choroidal vessels through the retina, which before only formed part of a uniform red field. After a time we cannot distinguish the vessels.

We may see patches, of a rounded form, arising from the discoloration of the choroid, and want of pigment; at the same time the retinal vessels covering these become more tortuous, and probably varicose.

This state, which is called *maceration of the pigment*, there are strong grounds for thinking invariably leads to atrophy of the choroid and retina. According to Desmarres, the patches arising from disorganisation, the result of choroidal disease, may be distinguished from patches arising from exudation, by being of a rounded form; the exudation patches being almost always of an elongated, or oblong form. The pigment becomes collected into spots, which look dark, and have jagged edges. Between these pigmented spots are often portions, red from extravasated blood. We may have, at the same time, patches from disorganisation and the other form. See *Cases of Subacute Choroiditis*, in Desmarres, at pages 419, and 421.)

Choroidal Congestion is generally serious according to the length of time it has lasted.

Hyperæmia, of an acute character, is a concomitant of most internal ophthalmic inflammations; but is in many cases remediable, and goes off with the cessation of the primary disease. The exudation patches, which are by no means rare in choroidal affections, besides having an elongated form, like that of a fillet or band, present a colour more or less bluish, easily contrasted with the white rounded patches, indicating disorganisation, absorption of pigment, and obliteration of the vascular layer of the membrane.

Sclero-Choroiditis, which is often either a primary disease, or a concomitant of other internal affections, when it has become advanced is known by a peculiar appearance, situated in immediate contact with the optic papilla. We shall find this part surrounded, totally or partially, by a patch, which begins by being semilunar, apparently prominent, but in reality concave. This is often far from being regular in its outline; it is jagged too at the borders; and if the disorganisation has gone on to any extent, it is in turn partly surrounded by a black mark or border, arising from deficiency of the choroid, and accumulation of pigment in this part. As the disease proceeds, this white patch, or arch, extends, forming at length a complete circle, but of irregular breadth, round the papilla.

In bad cases, the papilla looks as if concealed in a large white patch, having the appearance of a double cone; and if the disorganisation proceeds, we shall have the state called *posterior, or sclerotic staphyloma*; when, in consequence of the total absence of the retina and choroid tunics, we see only the sclerotic beyond; or we may see it through a transparent retina. This is shown by our observing the retinal vessels traversing this white patch.

The entire absence of pigment epithelium, and other elements of the choroid, as well as of the retina, which has been noted in these and similar cases, by Desmarres, and other writers, we must remark is not observable in all cases, for Jäger states that in twenty-three instances he found the choroid a continuous membrane. (See Hogg *On the Ophthalmoscope*, page 80.)

Apoplexy of the Choroid. We often find by itself or in conjunction with the deep-seated inflammations, apoplectic or bloody effusions. These may be in the form of a red patch, which may evidently raise the retina; there may be several of these, of different sizes, scattered over the fundus, and they may traverse the retina and pass into the vitreous humour, where they may become diffused, or appear as distinct clots. These clots are capable of absorption, and the time occupied by this process varies much in different cases. Some are very rapidly absorbed. While undergoing this process, they lose their bright red appearance, and become more or less brown; but those which remain unabsorbed a long time, often retain their primitive vivid red colour and character. As in other local changes in the fundus, the impairment of vision altogether depends upon the situation of these deposits. If they involve the immediate vicinity of the macula lutea, vision will be very much affected; but considerable bloody deposits may exist in other parts, and be more or less permanent, without materially impairing vision. Intermixed with these collections, we often see the white patches which indicate the disappearance of pigment. (See Desmarres, vol. iii, p. 437, in which a bloody patch is seen, having its original appearance, after ten months duration.)

Atrophy of the Choroid is a concomitant or consequence of