weigh. Pack in a percolator (the percolator being furnished with air valves, or being otherwise so constructed that the percolation may be arrested when desired), add ether until the whole of the powder is saturated, and a small quantity of the ether has dropped into the percolator; arrest the percolation for twenty-four hours, and then continue percolating slowly until the whole of the ether has been used. If the last ether percolate should not be almost colourless, use more ether.

Remove the powder from the percolator; expose to the air, and break up any lumps after the ether has sufficiently evaporated; and continue the exposure, heating the powder, if necessary, to 100° or 120° Fahr., until all the ether has evaporated, when a uniform, nearly white, dry powder may easily be obtained.

Repack the powder in the percolator, add enough of rectified spirit to moisten it thoroughly; arrest the further flow of the spirit, and macerate for forty-eight hours; and pass rectified spirit slowly through until twenty fluid parts of tincture have been obtained.

In this process, the preliminary extraction with ether is for the purpose of removing the large quantity of inert oil contained in the seeds, which, if present in the tincture, would cause it to become opalescent on the addition of water.

The dose of this tincture is from five to ten minims. It may also be used in doses of half a minim to two minims, frequently repeated. It is nearly colourless, having a very pale yellow tinge; neutral in reaction, and intensely and rather persistently bitter in taste. It mixes unchanged with water, is not precipitated by solution of tannin, but becomes markedly opalescent when ether is added to it. Solution of perchloride of iron intensifies its yellow colour, and, at the same time, produces a slight haziness in the solution; and, after some hours, the slightly opalescent fluid acquires a greenish yellow colour.

The chemical and pharmacological experiments which I have made show that the seeds contain a much larger quantity of active principle than any other part of the plant. The pericarp of the follicles, and the comose appendices of the seeds, contain a relatively small quantity, and the quantity is not the same in each part of the pericarp. Details of observations on these points, as well as on the histology, chemistry, pharmacology and therapeutics of *strophanthus* are now nearly ready for publication; but, in the meantime, I must express the opinion that the seeds furnish the most convenient and trustworthy preparations for therapeutic administration, and that they alone should be used for preparing the tincture.

ON FRACTURE OF THE TUBERCLE OF THE TIBIA.

By J. C. OGILVIE WILL, M.D., F.R.S.E.,

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FRACTURE of the tubercle of the tibia is an extremely rare injury, and the case now to be recorded is interesting on that account, and also because it presents, in addition, features of unusual interest in connection with its diagnosis, treatment, and result.

G. W., aged 17, a fairly muscular lad, a stone-cutter, was admitted to the Aberdeen Royal Infirmary on the afternoon of Friday, August 28th, 1885, suffering from the effects of an accident which he had sustained a short time previously. He stated that, when jumping with a pole, he felt something give way in the region of the knee-joint, when he had risen about two feet from the ground. He was examined by the house-surgeon, who diagnosed the case as fracture of the patella, and applied a posterior splint, with elevation of the limb. When I visited the patient next day, the joint was enormously swollen, and extremely painful to touch, and there were two small, movable, bony swellings, one at the upper, and the other—the smaller one—at the lower aspect of the articulation. The patient had been unable to extend his limb, and the slightest movement occasioned great pain. Believing that I had a case of fractured patella to deal with, and holding, as I do, the belief that wiring the broken ends is, if properly carried out, a safe and the only thoroughly reliable mode of obtaining bony union, I arranged to carry the procedure into effect on August 31st. The patella was exposed in the usual way by a vertical incision, when I found that it was intact, but that there was a fracture of the tubercle of the tibia; the ligamentum patellæ, instead of having given way itself, as it is known to do not infrequently, having been torn away with the bony prominence into which it was inserted. The portion of bone was about the size and shape of a small oyster-shell, and on the incision being extended downwards so as to expose it more thoroughly, its fractured surface was turned upwards from muscular contraction. It could, however, be readily replaced, closing with a snap not unlike that of a Cavendish whist-

marker. The joint was full of blood. I attempted to fix the broken bone in position with ivory pegs, but finding that they would not answer, I fastened the detached tubercle to its shaft by means of an Archimedean drill, and having detached the handle, I left the metal point in position, its proximal extremity projecting considerably, to allow of its subsequent removal. The joint was then thoroughly cleared of clots. The soft parts were accurately adjusted, and an antiseptic dressing and a splint applied. The operation was carried out under spray, and I had the advantage of my colleague, Professor

Ogston's, kind assistance. The dressings were removed on the following day, when there was some bloody discharge on the protective and on the piece of gauze overlying it, but it was so slight in amount that the same external dressing was again employed. The patient had had a fairly good night; with the exception of some twinges of pain, he stated that he had suffered nothing. The temperature, on the night of operation, was 99.8° F., and on the following morning, 100.2° F. The wound was not dressed again until September 5th, when it looked well, and was free from all signs of inflammation. It was next dressed on September 11th, when the sutures were removed, healing, except in the neighbourhood of the pin, being complete. The pin was found to be quite loose on September 17th, and it was therefore taken away. There was slight superficial necrosis of a small portion of skin, but this soon healed under a carbolic oil and boric lint dressing, which was now substituted for gauze, and the limb was put up in a gum and chalk bandage.

The stiff bandage was removed on November 2nd, when union was found to be quite firm, but the knee-joint was, of course, extremely stiff. Massage was then employed, and the power of flexion and extension was gradually regained, so that, on November 9th, he could flex his leg to an angle of 120°.

On November 12th, he was allowed up for the first time on crutches; a week afterwards he could walk unaided, but he felt the joint weak, and, on November 24th, he left the hospital. He returned on December 4th for the purpose of showing himself, and then I had the satisfaction of finding that the functions of the limb were restored, for he walked rapidly and easily without the slightest perceptible limp, and he could execute all the ordinary movements of the joint as readily and completely with the injured as with the uninjured limb.

The symptoms presented by this case were extremely misleading, for fracture of the patella was exactly simulated, nearly all the signs of that injury presenting themselves, for the joint was largely distended with blood, there were two bony tumours whose outlines could only be indistinctly made out, on account of the swollen and exceedingly painful condition of the articulation, with a considerable interval between them, and the power of extension was entirely lost. The mode of occurrence of the injury likewise suggested fracture of the patella. The treatment adopted, although founded on a mistaken diagnosis, proved eminently satisfactory, and I believe that by no other means could so successful a result have been obtained. The injury itself seems to be a very rare one, for, so far as I have been able to ascertain, all English authors—with the exception of Treves, who quotes a case from a French writer—and all American writers, are silent on the subject. König notices fracture of the tubercle in the following sentence: "It is unusual that the ligamentum patellæ tears partly through at its insertion into the patella, still rarer that this occurs at its tibial insertion, and, rarest of all, that it is torn across. As in all similar ruptures at points of insertion, larger or smaller portions of the bone are sometimes torn away." While Pitha says: "The ligamentum patellæ is so strong that an extraordinary force is required to tear it, and the direct traction of the muscles tears the patella itself asunder much oftener than its ligament. Exceptionally only, and most likely when the substance of the patella is thick and firm, does rupture of the ligament occur under these circumstances, and usually it is at its insertion, or even in its insertion, so that a portion of the spine of the tibia remains hanging to the ligament itself. In this case the subsequent growth of osteophyte indicates the point when the bone has been torn out."

He quotes two cases of his own; one caused in a railway-guard by a violent effort to save himself from falling in jumping over a pool,

where the insertion was torn out, and the patella was displaced upwards for four fingers' breadth. The other occurred to a young officer when making a similar effort. The symptoms, this writer enumerates, are great pain, evident deformity, and upward displacement of the patella, but his cases were some months old before he saw them, and in them a loose band of union had been formed, enabling feeble movements of extension to take place, results so different from that attending the treatment in the case now described, that I venture to suggest the procedure adopted by me, or some modification of it, as a reliable method of treating this injury.

MENSTRUATION AND PHTHISIS.

By H. HANDFORD, M.D., M.R.C.P.,

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IN 1882 I called attention to the connection of menorrhagia with pulmonary phthisis in a graduation thesis for the University of Edinburgh. Since then, extended clinical observation has convinced me of the truth of the following two maxims, the first of which receives very strong confirmation from some statistics of phthisis published by me for another purpose in the *Medical Times and Gazette* for November 28th, 1885:—

1st. Early or excessive (frequently only relatively excessive) menstruation is an important and common predisposing cause of phthisis.

2nd. The female children of phthisical parents tend to menstruate unduly early and excessively.

The association of amenorrhœa with phthisis is universally recognised. It is the rule in the later stages, and is far from uncommon in the earlier periods of the disease. That menorrhagia plays a part in predisposing to phthisis, and that it is not infrequently met with in the very early stages is not generally acknowledged.

Dr. Graily Hewitt¹ has noticed the connection between uterine hæmorrhage and tubercle, or a tendency to tubercle. Similarly it was observed by French authors towards the earlier part of this century that many cases of phthisis in the earlier stages are characterised by menorrhagia rather than amenorrhœa, which latter only supervenes much later. But these observations seem to have been forgotten and discarded, especially since the discovery of the tubercle bacillus has, in the minds of many, done away with the importance of "predisposition" and "heredity"—a view by no means countenanced by the writings and labours of Koch.

Dr. Wade, in the Ingleby Lectures (*BRITISH MEDICAL JOURNAL*, June 5th, 1886, p. 1056) says: "We see other cases; cases in which the patient is precipitated by a first menstruation, or by two or three repetitions, not into a better, but into a worse state of health, and often into phthisis. One such case of phthisis has come under my notice within the last few weeks." My experience, gained chiefly from hospital out-patient practice, strongly confirms this. A typical case, illustrating both the maxims with which I commenced, is as follows:—

A. E., aged 19, curtain mender. Menstruation first commenced at the age of 11½ years, flow lasted five days, was excessive in amount, but recurred regularly every month, till the last year, when she began to spit blood, then it recurred every fortnight. This statement the patient volunteered. For the past year she has menstruated eight days at a time, the flow has been excessive in amount, and has recurred every fortnight, so that she is only "well" six or seven days. Her father and mother both died of consumption. She has had one brother and three sisters. Of these, one sister died of consumption, aged 19. Another died of "worm fever," aged 8. The remaining brother and sister are both consumptive.

The patient has had a winter cough for several years, has had a

¹ *The Diagnosis, Pathology, and Treatment of Diseases of Women*. Second Edition. Pp. 45 and 421.

"Pathologically, tubercle of the uterus has been usually supposed to be rare; but hæmorrhage from the uterus in tuberculous women, dependent on the state of the blood, rather than on organic local changes, is not so uncommon."

"According to my experience, young women in whom there are signs of a tendency to, or an actual development of, tubercle, are very frequently the subjects of profuse menstruation, the cause being the defective and vitiated state of the blood."

In these passages, which were, of course, written long before my observations were made, I was glad to find so strong a confirmation of the views I have expressed above—views which were based purely on the result of personal clinical observation before I had read the passages quoted. In the majority of the ordinary text-books I have not found any distinct reference to the connection of uterine hæmorrhage and pulmonary phthisis.

In making the above quotations, I must not be understood to accept the view that the "defective and vitiated state of the blood" is the sole cause of the hæmorrhage.

muco-purulent sputum for one year, and occasional hæmoptysis for the same time. For the past four or five months she has spit blood nearly every day to the extent of a teaspoonful, and sometimes much more. There were physical signs of consolidation at both apices, with a few moist râles. She had suffered from night sweats for one year. Temperature at noon usually 99° Fahr. Under treatment, chiefly by ergot at first, the hæmoptysis and the menorrhagia were checked, and the chest condition also improved somewhat, but after three or four months she was lost sight of. Other cases have been followed out to a fatal termination.

Turning now to the evidence afforded by statistics, it will be seen, by referring to my paper in the *Medical Times and Gazette*, quoted above, that for equal numbers of each sex living, the death-rate from phthisis at "all ages," is much greater for males than for females in Prussia, Sweden and Copenhagen, and slightly greater in England and Wales for the decade 1871-80. In the United States and in England for the two periods, 1851-60, and 1861-70, the female death-rate is very slightly higher than the male. But when we take the death-rate for each sex at different groups of ages for equal members of each sex living at each group, we find that during the first year of life there is a preponderance of male deaths. For the next years up to 10, the proportion remains very equal, but eventually the female deaths are slightly in excess. At the age-period 10 to 15, in all the tables the female deaths are nearly double the male. The home and school life, and the employment of children between these ages, are not sufficiently different in the two sexes to account for such a sudden change. The years 10 to 15 embrace the period of puberty, the establishment of which produces a greater disturbance, and causes a more rapid general development in the female than in the male. At this time, and at no other, the female, inferior to the male in stature, and weight from birth onwards, rapidly catches him up and surpasses him; so that between the ages of 12½ and 15 or 16, girls are both taller and heavier than boys (see *Life History Album*, by Francis Galton, F.R.S., pp. 84-5). It is probable that this excessively rapid growth, together often with some drain upon the strength from the menstrual flow, renders the female sex at that period an easier prey to tubercle than the male. From 15 to 20 the female deaths are double the male in the United States, half as many again in England, slightly in excess in Prussia and Copenhagen, and slightly below the male in Sweden. From 20 to 40 or 45, the female deaths still remain in excess in England and America, except in the decade 1871-80 in England. Here the male deaths are very slightly in excess, but the difference is remarkably less than after the year 45 is passed, when the male deaths are, as a rule, nearly half as many again as the female. In the other countries the great excess of male deaths shows itself at this period 20 to 45 also, though the difference is much less than at more advanced ages. Here again the simplest explanation seems to be the drain put upon the strength and general nutrition by child-bearing and lactation,² acting in a similar manner to menorrhagia at an earlier period. It is difficult to find any condition in the occupation or habits of women between the ages of 20 and 45, which should render them more liable to phthisis than men at the same age, and which would not be equally operative from 45 onwards, when in all countries there is a very marked predominance of male deaths.

Referring to the supplement to the Forty-fifth Annual Report of the Registrar-General, pp. cxii—cxvi, we find that the mortality for equal numbers of each sex living at each group of ages is from "All Causes" about equal for the two sexes at the age-period, 10—15. There is, however, a very slight predominance of female deaths. I have already stated that for the thirty years 1851-80, the female deaths from phthisis at this age-period are nearly double the male. There is also a definite, though very much less marked, predominance of female deaths at the age-period in question from diseases of the respiratory system other than phthisis,—from diseases of the circulatory system, fevers, whooping-cough, and diphtheria. From all the other classified causes, the male deaths are in excess. It is possible that the cause of the predominance of female deaths from the diseases mentioned may be the same as in phthisis, which is the only one in which the difference is so striking as to require an explanation.

And now coming to the bearing of these points on practical medicine. The occurrence of unusually early menstruation in a girl with a

² Fagge's *Principles and Practice of Medicine*, vol. i, p. 979. Child-bearing and lactation are recognised as playing an important part in predisposing to phthisis. Dr. Pye-Smith states, in the same place, that deaths of mothers "in childbirth," or "after delivery," are frequently due to phthisis. It is not without significance that in cattle, highly bred cows, and especially those animals that are noted for being good milkers, are unusually frequently affected with tubercle. In them the effect of quickly repeated pregnancies and of excessive lactation in predisposing to phthisis is well known.