

accuracy such as that claimed for the colorimetric method turned to clinical account by Schifone² on the basis of Niclot's method simplified by Achard. But for our usual clinical needs it is enough that we should know whether we have to deal with a few ounces or with pints, and the whole of this information, thanks to Grocco's discovery, can be obtained without any hurry in the space of two minutes.

Historical and explanatory note.—It is noteworthy that Banti³ in 1902 had described the occasional occurrence of a dulness behind the sternum, due to a fluid effusion pressing its way forward. Grocco's communication to the Twelfth Congress of the Italian Society of Internal Medicine at Rome described the triangle; and since then papers have been published in Italy on the same subject, including one by Pieraccini,⁴ another by Luigi Ferrannini,⁵ who has given much attention to the clinical study of cases and concludes from his discovery of a radioscopic shadow corresponding to the triangle that the dulness is due to local pulmonary condensation under the pressure of a displaced heart, and specially important papers by G. Baduel⁶ and by G. Baduel and Siciliano,⁷ whose exceedingly thorough anatomical and experimental research is reported in an excellent review in the *Epitome of the British Medical Journal* of Nov. 26th, 1904.

It should be noted that the dulness of Grocco's triangle is of the partial kind only. As shown in my diagram partial dulness also obtains over the spines included in the vertical side of the triangle; and usually there is more of it below than above. The dulness also lessens from the middle line outwards; but it possesses nevertheless a most definite outer boundary which it is our business to percuss out. My former teaching that the vertebral spines are not dull to percussion except when effusion exists on both sides of the chest remains a true statement in the sense that there is not any absolute dulness of the spines in cases of unilateral effusion.

As to the causation it is perfectly clear that there is no underlying fluid at the site of the triangle. Baduel and Siciliano's transverse frozen sections prove this. My own independent observations had led me to recognise in the mathematical constancy of the lines a strict analogy with the still less variable lines of the "lower dorsal dull patch" and to surmise that this geometry had in both cases an anatomical basis. It seemed to me, too, that the hydrostatic conditions in the sitting posture would lead to greater sagging of the pleural sac at the base, particularly below the level of the floor of the pericardium, where the mediastinum is looser and the abdominal contents offer only a yielding resistance. I arrived at the conclusion, which I find is entirely borne out by Baduel and Siciliano's transverse sections, that the pleural fluid, whether its amount be small or large, would gravitate to the bottom of the loose pleural sac and cause its closer and more extensive adaptation to the vertebræ. These observers have been able to trace a slight shifting of the long axis of the aorta under stress of large accumulations; and they warn us of the danger the vessel might run if a left Grocco's triangle were to be aspirated by mistake.

Paravertebral in its site, Grocco's triangle is therefore in my opinion *vertebral* in its mode of production and is not due, as assumed by Ferrannini, to pulmonary condensation or displaced viscera. It is merely another instance of fluid acting as a mute (as in the production of the "lower dorsal dull patch") and of that pleximetric function of the vertebræ in conducting to the surface amplified or diminished vibrations to which I have for some years called attention. In this case the mute is applied over a portion of the circumference of the vertebræ and the damped vibrations are conveyed to the surface by the compound pleximeter made up of the vertebral spines and transverse processes and of the heads of the ribs. Metaphorically speaking, the dulled spine casts its shadow into the resonant chest; and its shadow grows downwards in proportion to the increasing surface of its contact with the dull fluid which takes the place of dry resonant lung.

This view is strikingly confirmed by my latest observation, made since writing this paper, in a case of pyuria and

right lumbar abscess.⁸ The presence of a low but rather broad Grocco's triangle in the usual situation led me to diagnose also an empyema as a complication. But no pus was found in the chest, and the triangular dulness vanished as soon as Sir William Bennett's incision emptied the lumbar abscess. The case is valuable as showing that a paravertebral triangle of dulness may be set up at the base of the thorax by a collection of fluid below the diaphragm.

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CHONDRODYSTROPHIA FETALIS OR ACHONDROPLASIA.

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THE importance of a disease to the practitioner increases with its incidence and a rare disease commands little attention. The consequent difficulty in diagnosis must be my excuse for giving this account of a typical case of achondroplasia, a disease sometimes mistaken for rickets but more often perhaps for cretinism.

The patient, a strong healthy girl, aged three years and eleven months, had recently recovered from a severe attack of diphtheria. She had had no previous illness. Several medical men had seen her and she had been treated without result with thyroid extract and also for rickets. There were four other children, all normal. Dwarfism was not known to have occurred in any relative. Although clever at imitation the child's mental condition was below normal. Her speech was indistinct and curtailed, almost restricted to affirmation and negation. Her general appearance was

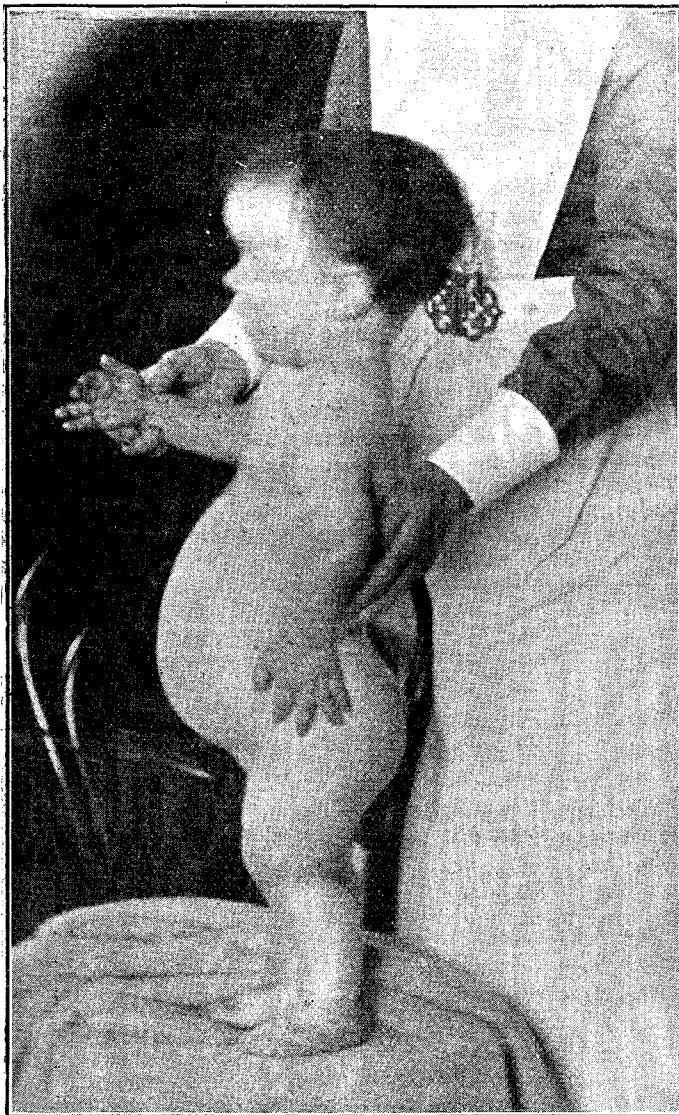
Measurements.		Case of achondroplasia.	Average of three normal children of same age.
Weight	24.5 lb.	28 lb.
Height	75.0 cm.	95.0 cm.
Head.	Circumference of head	52.0 "	48.6 "
	Occipital protuberance to root of nose	35.0 "	32.0 "
	External auditory meatus to external auditory meatus (over the vertex)	36.0 "	33.6 "
Face.	External auditory meatus to external auditory meatus (over upper lip)	21.5 "	23.3 "
	Root of nose to chin	9.0 "	9.2 "
	Circumference of neck	23.5 "	23.3 "
Trunk.	" " chest (level of nipple)	45.5 "	49.3 "
	" " abdomen (level of umbilicus)	52.5 "	46.0 "
	" " pelvis	46.0 "	46.0 "
	Suprasternal notch to symphysis pubis	32.0 "	32.5 "
	Length of spine	36.5 "	38.0 "
	Subcostal angle	120°	78°
Upper limb.	Length of arm	8.0 cm.	14.5 cm.
	" " forearm	11.0 "	12.8 "
	" " hand	8.0 "	9.4 "
	" " middle finger	4.5 "	5.8 "
	Circumference of arm	14.0 "	13.3 "
	" " forearm	12.5 "	12.6 "
	" " elbow	15.0 "	13.5 "
	" " wrist	10.5 "	10.1 "
	" " hand	12.5 "	11.7 "
	" " finger (first phalanx)	5.0 "	4.2 "
Lower limb.	Great trochanter to external malleolus	26.0 "	40.3 "
	" " end of femur	14.0 "	21.2 "
	Circumference of thigh (middle)	25.0 "	24.9 "
	" " calf	18.0 "	17.7 "
	" " knee-joint	20.0 "	19.6 "
	Length of foot	11.5 "	13.7 "
	" " great toe	3.0 "	3.5 "
	Circumference of foot (level of heads of metatarsals)	13.0 "	13.5 "

² *Riforma Medica di Palermo*, Nov. 16th, 1904. Cf., *Journal of the American Medical Association*, vol. ii., 1904, p. 668.
³ *Rivista Critica di Clinica Medica*, 1902.
⁴ *Rivista Critica di Clinica Medica*, 1903; and *Clinica Moderna*, 1903.
⁵ *Riforma Medica*, August 30th, 1904. Cf., *New York Medical Journal and Philadelphia Medical Journal*, Oct. 15th, 1904.
⁶ *Riforma Medica*, Palermo, xx., No. 6, 1904.
⁷ *Rivista Critica di Clinica Medica*, January, 1904.

⁸ *Medical Register*, 1905.

peculiar. The large cranium with prominent forehead, the depressed nasal bridge and consequent flat appearance of the face, the small chest and prominent abdomen and buttocks, and the short limbs and trident fingers made up a characteristic picture. The measurements of the head, trunk, and limbs, compared with the average of those in normal girls of the same age, will show the more marked features of the case.

The tip of the middle finger reached only to four centimetres above the great trochanter, while in the normal child it reached nine centimetres below the great trochanter. A



small part of this difference was due to the want of complete extension in the elbow-joint—a condition usually seen in these cases.

From these figures it is plainly seen that the limbs and the chest were well below the average and the face measurements slightly below, while the cranial portion of the skull, the abdomen, and the circumference of the hands and fingers were above the normal size. The accompanying photograph displays these characters.

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THE DIGESTIVE AND OTHER ACTIONS OF APPLES, PEARS, CHERRIES, STRAWBERRIES, ETC.

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THE value of the soft fruits as an adjunct to the more solid articles of diet has for long been recognised. The salts which they contain have been regarded as useful in building up the tissues by supplying them in the proper combination required by these tissues, while the succulent and indigestible fibrous material has been recognised as a salutary irritating

agent to the gut in persons inclined to constipation. So far good, but the succulent fruits possess other properties not so often appreciated but yet as important as those with which we are already so familiar. The first property may be stated as follows. The organic acids contained in fruit unite with the iron of the more solid foodstuffs to form malates, citrates, &c., and these malates, citrates, &c., are acted upon by the digestive juices low down in the gut, where the iron becomes soluble and active. The great advantage is that the iron in this form is non-irritating. As is well known, much of the iron of our food is lost as iron because it passes out of the gut unused, and unused because it is insoluble. This matters little if the hæmoglobin standard is maintained but in anæmia it is a very important point. Here a suitable dietary made up of proteid and a reasonable supply of fruit may "cure" the condition. As I have already said, the acids of the fruit "fix" the iron contained in the proteid forming organic iron salts which are broken up lower down in the alimentary tract and can be employed by the blood tissue. I know it is denied that the organic preparations of iron are of service in anæmia but from this view I dissent because I have again and again proved its fallacy.

The second property possessed by many of the succulent fruits depends on the presence of a ferment or ferments. I do not mean the ferment common to all living tissue, animal as well as vegetable, such a ferment as will split up glucosides, but I mean rather a series of ferments analogous to those found in the pancreas. We have many familiar examples of the operations of the ferment common to vegetable and animal substances. Tincture of kino when kept from one to two years shows signs of gelatinising and this has been proved to be due to the action of a ferment which is present in the gum kino and the action of which is only developed at the end of a lengthened period. Tincture of digitalis at the end of two years begins to lose its efficacy and this loss is due to the glucosides being split up by a ferment. Another example we find in the bitter almond. Ferment and glucoside lie side by side and remain inactive in the dry state but as soon as water is added the ferment becomes active and splits up the glucoside amygdalin into the well-known aldehyde and hydrocyanic acid. As yet another example of ferment action we turn to the animal tissues and note that when the proteid compounds of silver or other metal are brought into contact with the discharges from the eye or from an open wound the compound is broken up. These are all instances of ferments common to all living tissues and possessing no special action, but my chief purpose in the present paper is to call attention to ferments resembling pancreatine in the animal and papaine or bromeline in the vegetable kingdom. I wish to show that many common fruits contain ferments which play the part of papaine and bromeline (the ferment of pineapple) and that they can digest both egg and serum albumin to some limited extent. The following experiments undertaken to prove or disprove the presence of digestive ferments will indicate the drift of my argument.

I.—THE ACTION OF STRAWBERRIES ON ALBUMINS.

The action of the fresh fruit on coagulated egg albumin.—If fresh ripe strawberries are cut into thin slices and spread in double layers over the bottom of a thin glass dish and on the top of this is placed a thin layer of rubbed-up coagulated egg albumin, and on the top of this another double layer of sliced strawberry, the albumin is sandwiched between layers of strawberry and so is continually moistened by the juice of the fruit. Digestion slowly takes place at the end of eight hours' exposure at summer heat. Evidence of digestion of the albumin is obtained in the following manner. The mass of egg albumin and strawberry is mixed with cold water, stirred up, and the whole is filtered twice through paper when a clear filtrate is obtained. To this filtrate ammonium sulphate is added in excess and a dense precipitate falls and on examination it is found to be a proteid, probably an albumose. Compared with this, similar weights of strawberry and albumin examined without being subjected to digestion yielded very sparing precipitates.

The action of strawberry juice on serum albumin.—In this experiment small masses of coagulated serum albumin (prepared from fresh meat) were placed between treble layers of sliced strawberry and exposed as already detailed in the egg albumin experiments. At the end of eight hours the masses of albumin were found to be softened and eroded