so slow that the character of the lesion might still be doubtful but for the fact that we know that caries of the sternum usually goes on slowly, in this way, producing a diffused or firm swelling. Beyond the removal of the carious portion of the bone, I know nothing to do. It is a case difficult to treat to advantage. When the upper swelling opens both will continue to discharge for a long time.

In the other case we have a strong man and a different growth. The tumor is nine months old. Instead of being diffused it is circumscribed and abrupt. It is lobulated, non-fluctuating, hard in consistence, with a sharply defined base. It followed a blow. I think it is not an inflammatory tumor. It is a rarer form of growth, and simulates an enchondroma. It is about as large as a horse-chestnut. There seems to be a crater in the bone where it escaped from the diploe. As to a definite diagnosis, if the growth be inflammatory a few weeks will develop characteristic symptoms in that direction. If it be a neoplasm, other symptoms will declare themselves in an opposite direction. In a word, we cannot now make a positive diagnosis, and must wait. But if it be an enchondroma any operation would be merely palliative.

Original Articles.

CASE OF MULTIPLE MELANO-SARCOMA OF THE SKIN.

BY L. DUNCAN BULKLEY, A. M., M. D.,

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Mr. —, aged twenty-two years and nine months, first came under my care December 17, 1874, when the following history was obtained:—

He had always been healthy as a child with the exception of a few convulsions. His parents are Americans, living, and in perfect health; he resided within thirty miles of New York. Eight years ago he was operated on for a ranula, which had existed since infancy; the ranula still persists, and fills up and discharges from time to time. Six years ago, while watching a barrel in the process of being hooped, something struck him in the outer side of the right eyeball, inflicting a bruise on the sclerotic. No treatment was adopted, other than keeping the eye closed, and very little inflammation followed. Shortly after this a minute black speck appeared on the site of the bruise, which has steadily increased in size. This is now seen as a bluish-black tumor one fifth by one third inch in diameter, slightly elevated, and with dilated veins running to it. Two and a half years ago the first lesion appeared in the skin, just in front of the lobe of the right ear, which enlarged up to the size of half a walnut, and has again diminished in size, until now it is that of a large split pea, movable with the skin; this tumor has never been colored on the surface, but is of the natural hue of the skin. A year later, that is, a year and a half ago, he noticed a tumor on the left side of the chest, in front; this was discolored, bluish-black from the first, and has since disappeared, as have certain other tumors.

About nine or ten months ago one appeared beneath the left arm, which has flattened and remains, of a dark color. The next tumor was situated on the right temple, the size of a large walnut, which was removed

by Dr. George K. Smith, of Brooklyn, June 30, 1874; another small one had been previously removed, June 19th, from the cellular tissues just below the lower lid of the left eye. Dr. Sherwell, of Brooklyn, who saw the case and examined these specimens, reports that there was no discoloration of the skin over this latter tumor, nor any undue signs of vessels in the neighborhood, or any hyperæmia. The wound bled pretty freely, but not more than natural. The tumor itself was friable in structure and almost black in color. Microscopically a great excess of pigment matter was found, and many large cells with two or even three nuclei, rendered much more distinct by acetic acid. The tumor removed June 30th had the same consistency and color, and presented the same microscopical appearances.

At this time the fundus of the eye was examined by Dr. Matthewson, of Brooklyn, without finding any morbid appearance or deposit, even in the right eye, originally affected by the first tumor of the sclerotic. The larynx and back of the tongue were examined by Dr. Sherwell and found normal.

During the last nine months the development of the tumors has been pretty rapid, new ones being discovered almost daily up to the present time, while others disappear occasionally. During the past few months the general surface of the skin has been very decidedly darkening, especially that of the face, which now presents much the appearance of that seen in Addison's disease.

The condition of the disease when first seen was thus recorded: The whole surface, from head to foot, is more or less covered with a development of subcutaneous tumors of various sizes and shapes, varying from that of a very small split pea, to an inch and even two inches in diameter. Most of the masses are circular, and occasionally a long one is observed, as on the right forearm, where there is one two inches long by three quarters of an inch wide. Some of the lumps appear to be made up of several tumors closely set together. Most of the tumors are distinctly raised above the skin, to various heights, some being round on top, others quite flat; even those of an inch or more in transverse diameter may be elevated only a quarter of an inch or so above the level, and be quite flat on top. These appear to be such as have reached their height of development and are undergoing absorption.

All of the tumors are decidedly hard and firm to the feel. Some of them are colored, of various shades, from a greenish-brown to a deep blue-black, but most of the tumors externally appear of the color of the skin. Over these latter the skin is quite freely moveable, but over those of a dark color, which are really those undergoing atrophy and flattening, the skin is thick, hard, and united with the tumors.

It is impossible to give the exact number of the separate masses, so many smaller ones are deeply imbedded beneath the skin, and can be found only by palpation. When stripped the body appears to be very thickly sprinkled with them; last week his brother counted one hundred and fifty by the eye.

As previously remarked, some of the tumors are now disappearing. After having attained a certain size, or rather height, as apparently subcutaneous tumors, covered with skin of a normal color, they become first of a purplish color, which deepens until of a deep black. While this is going on the tumors seem to flatten, then absorption appears to take place, the surface sinking

and the color fading somewhat, until at present some of the older ones on the chest and abdomen are seen only as flat discolorations, of the level of the skin, presenting a hue much like that of a nitrate of silver stain. The statement is made by the patient and his father, who are both very intelligent persons, that all of these tumors which have undergone this change have previously bled spontaneously or from friction of the clothing. Some of the lumps showed signs of recent hæmorrhage, especially some situated on the legs near the knees; he states that some bleed every night, the sheets being always bloody in the morning. These changes in the tumors are more prone to occur in those on the chest and abdomen, where he is apt to press upon them in his occupation, which is that of an expressman delivering sewing machines.

A very curious condition develops in connection with some of the tumors, notably in those upon the chest and abdomen. During the process of absorption, when the mass has flattened considerably, there appears a ring or collar around the tumor, which is very distinctly marked in a number of places at the present time. This ring is about a quarter of an inch in width, and in some instances hard, slightly elevated, and of a bluish-black; in other places the ring appears simply as a colored band, not elevated, around the central pigmented spot, separated from it by a very narrow portion of healthy tissue. In some instances this ring is seen around tumors over which the integument is slightly if at all colored. The patient asserts that this circle is always formed around a tumor which has become discolored, and also that those which become discolored on the surface always bleed at some time.

The entire skin is of a darkish hue, though not so dark as the face, which has more the appearance of general nitrate of silver staining or of Addison's disease.

His general condition is good; he feels strong and well, with a good appetite. He has lately been gaining in flesh, and has improved in every way under Fowler's solution, which he has taken for five months or more. He has just begun to notice some choking sensations about the throat; of late, also, is restless in sleep.

On examination the liver was found to measure four inches perpendicularly, and to extend an inch and a half beyond the median line. No mesenteric enlargement was discernible on palpation; the skin of the abdomen was so thickly studded with tumors as to render exploration very difficult. The lungs appeared to be perfectly normal on physical examination.

The urine was first examined on June 19th, by Dr. Smith, of Brooklyn, at the time of the first operation. It was then of a brown color. On July 6th Dr. Sherwell reports it as dark colored, strongly acid, specific gravity 1022, with crystals of uric acid, stained of a distinct blue shade, which seemed to intensify on exposure to light.

At the time of the first visit to me the urine was found to be of a coffee-brown color, with a specific gravity of 1020, with urates quite abundant, and a moderate amount of oxalate of lime. Later on the color became at times of a very dark-brown color, occasionally very muddy from the urates. Sometimes it would appear of a much lighter color, as that of sherry wine, and would remain clear for some time. The sediment, which at times was quite abundant, was, besides the urates and oxalates, made up of irregular

pigment masses and particles, largely amorphous; many of them were apparently contained within epithelial cells, from the pelvis of the kidneys; many of them resembled the pigment celloids of Roberts. The quantity was tolerably free when first seen, but later it became much reduced; once only fourteen ounces were passed in the twenty-four hours. The largest quantity secreted in the same time, while under observation, was thirty-eight ounces.

The subsequent history of the case can be told in a few words. The patient rapidly lost in strength and flesh, and the tumors continued to develop anew, and also to undergo the process of absorption and disappearance before described, only the total mass of cutaneous tumors was steadily on the increase. Tumors reappeared in the site of those excised.

Six weeks after he was first seen he was in a greatly depressed state; swelling of the legs had appeared. These were bandaged, but soon his weakness prevented his coming to the office, and he entered Roosevelt Hospital.

On admission to the hospital, April 23, 1875, his pulse was very rapid, 144; temperature 101° Fahr. He complained of great dryness of the skin. The ranula previously referred to was discharging freely; also an abscess in the right cheek, which discharged through the mouth. There were also open abscesses from ulcerated tumors in the vicinity of the right shoulder, on the inner side of the left fore-arm, and several on the right leg. These discharged pus and pigment of an almost solid consistency; there was also an almost constant oozing of blood. The breath was very offensive. Mental powers perfect.

He remained in the hospital about three weeks, and died there on May 16th. During this period the urine showed the same appearances as before noted; it was acid, specific gravity 1018, was dark colored, and contained a trace of albumen. He failed rapidly, becoming more and more bronzed, until at the time of death the general melasmic state of the skin was very striking. The temperature rose to 101.75° Fahr. at the highest, remaining thereabout. During the last few nights of life he was delirious, as also at intervals during the day. For the forty-eight hours previous to death he was mildly delirious most of the time, passing his urine and feces unconsciously; the discharge from the bowels was very thin and of a dark-greenish color. He was very restless during this period, and seemed to be in great pain.

Autopsy by Dr. Delafield, May 17, 1875. The entire skin is of a dark color. On the surface of the body, just beneath and in the skin, are seen a great number of tumors from the size of a pea to that of a hen's egg, many of them of a dark purplish-black color. The dura mater is grayish, and on its inner surface coated with a thin layer of fibrin. The pia mater is normal, except for one small pigment nodule. The substance of the brain is not pigmented, and appears normal. On the right eye, in the sclerotic, close to the outer edge of the cornea, is a small black nodule the size of half a grape seed. The interior of the eye appears normal. The pharynx, trachea, and large bronchi are grayish. The lungs are not pigmented; the left lower lobe is oedematous and partly hepatized. The pericardium is distended with clear serum; heart normal. The peritoneal cavity contains purulent serum. The liver and spleen are pigmented, and black nodules are found in the liver. The mucous membrane

of the stomach and small intestines is congested and coated with mucus. The cervical, bronchial, and mesenteric glands are large and black.

RECENT PROGRESS IN ANATOMY.

BY THOMAS DWIGHT, M. D.

THE SCAPULAR INDEX.

THE precise value of this test in anthropology and comparative anatomy is still to be determined, but as it is likely to be discussed for some time a description of it will not be out of place.

The test was invented by Broca,¹ who applied it to various races of men and to an extensive series of animals. Flower and Garson² have used it also for the study of human races and the higher apes. The lines are drawn as follows: AB, representing the breadth of the bone, runs from the centre of the outer border of the glenoid fossa along the base of the spine; CD connects the highest and lowest points; a third line unites A and D.³ The scapular index $= 100 \times \frac{AB}{CD}$; the infraspinous index $= 100 \times \frac{AD}{AB}$. Broca found from a study of twenty-three European and twenty-four negro skeletons that the scapular index in the former was 65.91 and the infraspinous 87.79; in the latter the scapular index was 68.16 and the infraspinous 93.88. Flower and Garson found the scapular index of two hundred European skeletons 65.20 and the infraspinous 89.40. Of the observations on lower animals we will mention merely those on the scapulæ of gorillas and chimpanzees. It is worthy of note that the latter more closely resemble man, as the following table shows:—

BROCA.

Of 5 chimpanzees, sc. index 68.52; infs. ind. 130.23.
Of 10 gorillas, sc. index 70.38; infs. ind. 126.05.

FLOWER AND GARSON.

Of 21 chimpanzee scapulæ, sc. index 69.9; infs. ind. 138.8.
Of 16 gorilla scapulæ, sc. index 72.2; infs. ind. 132.5.

From this it appears that in man and the higher apes a long scapula indicates a higher type than a short one. The methods of progression and prehension in animals below the primates differ so much from those of man that the shape of the scapula is very different, and a comparison of the indices of little value.

MUSCLES OF THE LIPS.

In the Report on Anatomy, published in September, 1877, we mentioned some observations on these muscles by Professor Henke. The gist of his paper consisted in so grouping the muscles that they presented essentially a regular diagram for both sides of the upper and lower lips. The triangulares were described as passing into the diagonally opposite quarter of the lips. Thus the fibres of the right inferior triangular muscle could be traced into the left half of the upper lip.

¹ Bulletin de la Société d'Anthropologie de Paris, Tome 1, Troisième Série, 1878.

² Journal of Anatomy and Physiology, October, 1879.

³ In the diagram the point A has been put too high. The lines do not cross at a right angle, as would appear to be the case.

Professor Aeby⁴ has recently added some interesting details to our knowledge of the subject. They are for the most part based on sections to be studied with a low magnifying power. The existence of a continuous circular muscle is denied. What we have known as the orbicularis oris is said to consist chiefly at least of the triangulares and the buccinator. The latter forms the body of what we must still call the orbicularis, and lies under the outer red portion of the lips. Flat sections show very beautifully a decussation of fibres from the two sides of the outer part of the orbicularis. Close to the free edge in the part just stated to be formed by the orbicularis this does not occur. A little further off the more superficial ones run into the skin in series of small bundles, crossing similar ones from the other side. At a greater distance no fibres continue in the lip, but all go to the skin. By far the greater number of these fibres cross the middle line. This arrangement is more clearly seen in the lower than in the upper lip. Aeby denies emphatically that the zygomaticus has any share in forming the orbicularis. It ends in the angle of the mouth. As it approaches this point it divides into two bundles. The smaller runs by the triangulares at their crossing point into the skin; the latter, if we understand Aeby correctly, pierces these muscles, and runs into the mucous membrane. Aeby discusses also some fibres running between the skin and the mucous membrane, first described by Klein as the compressor labii.

ANOMALIES IN THE NEGRO.

Professor Turner⁵ records numerous peculiarities of structure met with in the dissection of two negroes. Colored subjects are too common in American dissecting-rooms to attract attention, but it is to be regretted, in the interests of anthropology, that we have not improved our opportunities of searching for peculiarities of structure that might be characteristic of the race. We mention some of the anomalies described by Professor Turner solely on account of their intrinsic interest; there is no reason to consider them expressions of any law. In the first subject muscular anomalies were numerous, though few were very rare. The pectoralis minor, beside being inserted into the coracoid process, gave off a strong band that blended with the capsular ligament of the shoulder-joint. More remarkable was the right brachialis anticus, which arose by a superficial mass from the humerus below the deltoid, and by a deep one from the lower third of the anterior surface of the humerus. The two portions united to be inserted into the coronoid process, but from the deeper one a distinct slip proceeded to the tubercle of the radius. A muscular bundle from the pectineus joined the tendon of the adductor longus. The peroneus brevis, beside its usual insertion, had one to the tubercle on the outer surface of the os calcis. But few anomalies of the vascular system are mentioned, the most remarkable of which is a loop in the deep palmar arch, formed by the splitting of the radial. The most striking peculiarity in the body is described as follows: "From the internal aspect of the left ulna an osseocartilaginous process projected, from the summit of which a fibrous band passed down to the carpus in proximity to the pisiform bone. Under this band a branch of the anterior interosseous artery, which ran downwards along the inner surface of the shaft of the

⁴ Archiv für mikroskopische Anatomie, Band xvi. Heft 4.

⁵ Journal of Anatomy and Physiology, April, 1879, and January, 1880.