emulsion may be made with it, such as is made with cod-liver oil, by means of mucilage or other emulsifying agent. But the taste of the oil usually outlives that of the flavor, and these agents are, therefore, only partly successful. Another good way is to rinse the mouth with clear whiskey or other spirit, or lemon juice, then immediately to swallow the oil, and follow it with another rinsing with the liquor. If thoroughly emulsified, with the addition of orange juice, a confection is formed which is almost unobjectionable. Finally, it is put in elastic capsules, which for small doses, in the case of patients who will learn to swallow them, completely cover the taste. All these means, however, are more adapted to grown persons than children; for these the emulsion is probably the best, or it may be covered with a little lemon juice or glycerin. Another useful way to give castor oil, in certain cases, is by injection; in this way it acts principally locally and mechanically as a lubricant, but a certain quantity must be absorbed, as there is often more result from it than would be explained in this way. A good method is to give, for an adult, from 60 to 120 gm. (℥ij. to iv.) clear, to leave it for from one-quarter to three-quarters of an hour in the bowel, and then to follow with a full enema of soap and water. Very free emptying of the lower bowel usually follows.

Castor oil is absorbed to a slight extent by the skin, but the method has no practical value.

Dose by the mouth, as a laxative, from 5 to 10 gm. (℥ i. to iij.); as a purgative, from 15 to 30 gm. Children require large proportionate doses. A baby a week old can easily bear from 3 to 5 gm., and a child of five or six years, 10 or 15 gm. *Henry H. Rusby.*

**CASTRATION.**—The removal of the testicles or ovaries.

I. Historical Sketch of Castration in Men.

Castration is a very ancient practice. It was a consequence of the system of polygamy. The word eunuch means literally having charge of the bed-chamber. The Hebrew word means mutilated, and the first royal chamberlains were probably castrated men. Later the term eunuch was applied to men in all sorts of offices and it lost its original meaning. In some of the Eastern courts the eunuchs often played an important rôle and became so prominent in affairs of state that the word eunuch came practically to be the name of a great state officer, the chamberlain.

Eunuchs are represented on the bas-reliefs found during the excavations at Nineveh. "Here and there along the sculptured procession, in strong contrast to the bearded men, the eunuchs stand out with their smooth, beardless faces, fat cheeks and bald double chins. The artists adopted these features as a conventional mode of representing them."*

Herodotus relates that the castration of slaves was an industry among the Greeks. These slaves brought a high price in the markets of Ephesus. They were regarded as the most faithful and most capable servants. In Rome also there were numerous eunuchs. Castration has been a feature in certain religious doctrines, one at least of which taught that it was necessary for salvation. The beautiful soprano voices possessed by some of the eunuchs made them a prominent feature in the musical portions of religious services. We are indebted to Korsakow,† physician to the Russian Embassy, for interesting data concerning the eunuchs in China. Early records of castration in China date back to 1100 B.C. Next to beheading it was at one time the most severe form of punishment. The eunuchs are used as slaves in the royal household at the present time. Some are forcibly castrated, others submit voluntarily as a result of poverty, and others are sold into slavery as children by their parents.

In China the operation is usually performed in childhood. The trade is hereditary in certain families. The fee is about ten dollars. If the victim has no money the amputated genitalia are retained by the operator as surety. The operation is performed in the following manner. The genitalia are first completely anæsthetized. The specialists are said to possess a secret method of local anæsthesia. The external genitalia are then removed with one stroke of the knife. Crude methods of stopping the hemorrhage are employed. They have no notion of surgical asepsis. Dissection is forbidden by law and as a result they have no surgery. Retention and fatal sepsis are a common sequence. Incontinence may follow retention. In this case it is said that the approach of the patient may be recognized at a considerable distance on account of the strong odor of ammonia. Later the aperture of the urethra tends to contract and a wooden dilator is introduced and at first is worn constantly except during micturition. Even with these precautions retention follows in most cases as a result of cicatrization. With this are associated cystitis and the formation of vesical calculi.

The classical type is seldom seen in Pekin. The middle-aged eunuch differs little from other Chinamen. Those castrated in youth attain full stature. The timbre of the voice is like that of a woman. Those castrated after the age of twenty rapidly lose their hair and their voices become harsh and unpleasant. They age rapidly and at forty they give the impression of a person of sixty.

Lortet* says that in most of the large cities of Egypt one meets in the streets many eunuchs, attached to rich families as trusted servants, especially as servants and guards in the harems. The methods of operating among the Egyptians are barbarous and the mortality is great.

Many of the eunuchs castrated early in life were said to preserve the pure, clear timbre and high pitch of the boy's voice, adding to this the power of the grown man's lungs. In the Italian opera many of them attained prominence as really great singers.

"Reputable authors assert that," in Australia, "the wild natives limit the increase of families by crushing the testicles of the father after his first child is born."*

II. Effects of Castration on Male Animals.

Domestic animals are ordinarily castrated because they grow and fatten more quickly and are more valuable for working purposes. The effects of castration on animals are summarized by Andrews.† He gives an interesting account of the effect upon the elk as observed in two cases by the late Judge Caton, of Ottawa, Ill. "The course of horn growth in the uncastrated buck is this. Their so-called horns are not composed of real horny material but of true bone, and are developed into antlers of immense size. They are shed annually, as in all the deer tribe. During the spring and summer they grow rapidly. They are then covered with skin, hair, and connective tissue, and are supplied with numerous large arteries and veins running between the bone and the skin. This is the stage called 'the velvet.' Toward autumn a narrow, knobby ridge or ring of bone, like a narrow provisional callus, begins to develop around the base of each horn; the ridge pushes out and presses hard against the nutrient vessels supplying the horn, and in some weeks obliterates them. The velvety skin and connective tissue covering the antlers are cut off from nutrition and die. The bony horn itself also dies later and the dead skin dries and becomes loose, and the animal rubs it off among the trees and bushes, leaving the superb antlers in their perfected condition. The antlers now have no nutrition except a little derived from the small interior vessels of the cancellated tissue, which are soon obliterated. They are now two immense necrosed bones and in the course of the winter undergo a separation, like any other necrosed bone, and drop off. In the spring a new pair sprouts and develops, like their predecessors. Judge Caton found that if while the young horns were in the velvet the buck be castrated, the pair of horns then developing would go on, finish their growth, and be shed the following winter as usual; but the next pair were never shed. The effect of the castration is to prevent the formation of the bony ring at the base. Consequently the blood-vessels are not obliterated, the horns continue in the velvet, they do not die, and are not shed. In our climate, however, the severity of the winter freezes the antlers and kills them down to a point, perhaps, eight inches from the skull. The frozen parts ultimately drop off and in the spring numerous small horns, like fingers, sprout up from the stumps. The next winter these are partly frozen, and so on until a pair of large knobby bunches of bone stand up on top of the head.

"So far as I know, no one has tried protecting these horns from the winter's cold to see what they would grow to. They would probably attain an immense size."

The ox is larger than the bull but relatively the neck and forequarters are thinner. The cerebellum is said to be larger. The horns are greater in length and diameter. In the adult bull the voice in lowing is an octave higher than that of the ox. This is in contrast to the effect of castration upon the human voice.

The wool of the wether is said to contain less lanolin than that of the ram. This is of importance commercially. Castrated cats are excellent mousers. They are considerably larger than normal cats.

It is stated that among certain species of squirrels, the males, in fighting, castrate each other. There seems to be no doubt that many of those captured by hunters have been castrated in some way; but exactly how it occurs does not seem to be settled. The capon or castrated chicken is fifty per cent. heavier than the cock. The flesh is more delicate and more tender. "Their spurs remain undeveloped, the colored comb and wattles about the head remain very small, and the gay ornamental plumage of the cock is mostly wanting."

III. Effects of Castration on the Human Male.

Castration in early life exerts profound developmental influences. The secondary sexual characters of the male are expressed in part by his greater size and strength and deeper, rougher voice. The origin of these characteristics is probably due to nervous or chemical influences originating in the testicles. Experimentally the invigorating effects of the injection of testicular extracts have been shown. Zoth* showed that daily injection for one week increased by fifty per cent. the working power of a man's neuro-muscular system. At the same time there were less susceptibility to fatigue and greater power of recovery. These nervous or chemical influences are not essential to health as in the case of the thyroid.

At puberty there occur acceleration of growth, changes in proportion, and the growth of the beard. The pitch of the voice may fall permanently an octave and for the time being may become rough, broken, and uncontrollable. This is due to a general sudden enlargement of the laryngeal cartilages, and a lengthening of the vocal cords. In the eunuch the size, shape, and consistency of the larynx correspond more to the condition in the boy than to that in the female. Calcification of the cartilages in old age does not occur. The timbre of the voice is boyish and the pitch is soprano.

Apparently no accurate observations have been made concerning the changes produced by castration in early youth. The results of the operation as performed in some of the Oriental countries can hardly be considered cases of uncomplicated castration. The forms of operation differ widely. In many cases the entire external genitalia are removed. Complications arising from sepsis and other conditions must also be considered. No general statement concerning the changes in general appearance and nourishment can be made. There is probably a general tendency to adipositas, in late life at least.

Statements as to the condition of the musculature vary. Hair does not develop on the chest, in the axillæ or on the pudenda, and no beard grows on the face.

The thyroid in Gruber's* case was very small.

The internal genital organs are small and undeveloped. This is the case with the penis also.

In animals an arrest of development in certain parts of the brain has been described. Statements concerning peculiarities of character and the mental capacity of Oriental eunuchs have been made, but they differ so widely that no general conclusions may be drawn. Some are described as weak and of a jealous, intriguing character. Others are said to possess great energy and ability. It is probable that the moral atmosphere in which they lived has considerable influence in determining these characteristics.

*Effect on the Sexual Life.*—Sturgis,† after giving an historical review, calls attention to the forensic importance of this subject. He concludes that in animals, for a varying period after complete castration, normal spermatozoa are found in the contents of the seminal vesicles. This period varies in different animals, being six days for the dog, seven for the cat, and fourteen days for the guinea-pig. In man clinical cases are recorded in which fecundation of the female has occurred after coitus with the male who has been completely castrated. The difficulty of controlling all the circumstances, however, is obvious. Still pursuing the analogy in man as in the dog and cat, a complete castrate may be capable of procreation provided the coitus occur within the first seven days after the castration.

The impossibility of drawing general conclusions from a small number of cases brings up the question of accessory testes. Apparently a few indubitable cases have been recorded in which the accessory testis has been removed and examined microscopically. Turner‡ reports a case in which two testicles were found on the right side during an operation for hydrocele. One was situated above the other, the cords of the two apparently uniting. He also quotes a similar case reported by Lane. "Microscopical examination of the supernumerary testis showed well-formed tubules with spermatogenesis proceding." In neither of these cases, however, does there seem to have been a microscopical examination of what was considered to be the normal testis. It seems quite possible that in some cases of apparently complete castration normal functionating testes may be situated even intra-abdominally.

This is important also in connection with the question of the effect of castration on the sexual passion. It is said that sexual desire may persist after castration in manhood and may develop occasionally even when the operation has been performed in childhood. The ox and the gelding do not completely lose the sexual passion.

*Castration for Enlarged Prostate.*—The physiological relations existing between the testes and the prostate, the faulty development of the prostate after castration in early years, and the conception of an analogy existing between the hypertrophied prostate and myomata of the uterus, led to the performance of castration as a therapeutic measure in cases of prostatic hypertrophy.

From a developmental point of view the analogy between the hypertrophied prostate and uterine myomata is not well founded. Only the sinus pocularis, a remnant of the Müllerian duct, corresponds to the uterus. Anatomically and histologically the similarity to uterine myomata of the so-called myomatous form of hypertrophy is only superficial.

The faulty development and small size of the prostate after castration in childhood and the retrogressive changes

* Andrews, "The Oriental Eunuchs." Journal of the American Medical Association, xxx., 173-177, 1898.
† Korsakow, "Eunuchen in Pekin" (abstract). Deutsch. med. Wochenschr., xxiv., 338-340, 1898.

* Lortet, "Allongement des membres inférieurs du à la castration." Arch. d'Anthrop. Crim., xi., 361-364, 1896.
† Andrews, *Op. cit.*

* Zoth, Quoted by Lee, "Reproduction," in "American Text-book of Physiology," 878, 1896.

* Gruber quoted by Becker, "Ueber das Knochensystem eines Castraten." Arch. f. Anat. u. Entwickelungsgesch., 83-112, Leipsic, 1899.
† Sturgis, "Are Complete Castrates Capable of Procreation?" Med. News, lxxiii., 449, 1898.
‡ Turner, "A Case of Supernumerary Testis." The Lancet, ii., 174, 1900.

following the operation in early manhood, indicate only the effects upon a normal organ. Here, however, we are dealing with an hypertrophic and pathologically altered gland.

Following castration in animals there is an atrophy of the glandular portions of the prostate. In most cases of hypertrophy there is an increase in the volume of the fibro-muscular stroma. The pure glandular forms are relatively uncommon. An atrophy of the glandular portions alone would have little influence in reducing the size of the organ.

Retarded development of the prostate in congenital malformation and malposition (cryptorchismus) of the testes has been described. Apparently there have been a few cases of hypertrophy after castration in youth.

The danger of the operation in old patients has led to modifications of various kinds. Among these may be mentioned unilateral castration, division of the cord, ligation of the cord, division or resection of the vasa deferentia, division of Cooper's nerves, angio-neurectomy, and sclerogenous injection. These do not appear to be as effective as the original operation.

Many good results of the operation have been reported by trustworthy observers. Many very experienced surgeons report only bad results.

Although the sexual operations for prostatic hypertrophy have often been performed, and there is no lack of experimental evidence of the effect of castration on the normal gland, yet one cannot say that the relations of this operation have as yet been entirely cleared up. The indications have not yet been adequately determined, and one cannot say in any case what the result will be. The method in which castration brings about the result is still rather obscure, and the changes which the hypertrophied prostate undergoes have been little observed at autopsy or studied histologically. The observations have yielded no noteworthy results. In almost all cases an atrophy could not be demonstrated.

Important considerations are the effect on the central nervous system and the general effects. In old patients there is often rapid exhaustion of strength. Cases of acute mania have been reported. These effects may be due to the loss of an internal secretion. Frisch* has given up the sexual operations entirely. Three of his patients who were cheerful and strong before operation and had no evidence of involvement of the kidneys or other internal organs died within fourteen days after resection, as a result of a loss of strength amounting almost to cachexia.

The greater part of the publications on the subject are incomplete. A cure involves a condition in which the patient spontaneously completely empties the bladder within the normal interval. This fact is often lost sight of. Reports of a decrease in the size of the prostate are seldom based on accurate measurements. Œdema caused by retention is probably relieved, but the same result is attained by catheterization. Some of the reported cases have been operated on during the first period of retention.

There are a few apparently reliable cases in which the results were very satisfactory. Spontaneous micturition developed gradually and later a decrease in the size of the prostate could be demonstrated and was permanent. There was a decrease of residual urine and a disappearance of the obstruction and the cystitis. The contractility of the bladder returned after years of catheterization or the patients were more readily catheterized. The soft forms of hypertrophy are most influenced. Fatal results are frequently due to secondary changes in the kidneys.

The results of nursing, rest, and treatment of the cystitis are apt to complicate the observations, and cases given simply symptomatic treatment often yield equally good results.

It has not been decided what relation enlargement of the prostate bears to difficult micturition. There may be symptoms without much enlargement, and many old men with large prostates have no symptoms. The severity of the symptoms does not depend entirely upon the degree of hypertrophy. The hypertrophy is not physiological, but is caused by proliferation of a typical tissue and the result is much like that due to the presence of a neoplasm. There is possibly an embryological *Anlage** for the condition.

Most of the reported brilliant results have followed within a few days after the operation. They have possibly been a result of depletion of the venous networks, with which the prostate and the neck and walls of the bladder are supplied. These vessels communicate freely. Their congestion probably has a great influence on causing the symptoms. A distended bladder probably causes passive congestion in these vessels. In a short time this results in swelling and œdema of the neck of the bladder and of the prostate, and consequent closure of the orifice of the bladder. Castration possibly relieves this congestion by vaso-motor or other influences.

The late publications of some of the best observers indicate that the operation is at present employed only to a slight extent. Mikulicz† would limit the indications for the operation markedly. Frisch's‡ opinion, as expressed at the Thirteenth International Medical Congress, is as follows: "Of all the various operations for hypertrophy of the prostate only those which have for their object the complete removal of that portion of the prostate which prevents the free flow of urine offer any chance of lasting success." Under this head he does not include any of the operations involving the testicles.

The conclusions of Lequeu§ are reported as follows, from the same meeting: "As regards the remote results of double castration they are not so good as the early observations, which did not take a long enough space of time into consideration, would lead one to believe. The prostate certainly shrunk, but the patient improved to a far greater degree than could be accounted for by the diminution observed. The attacks of pain were less frequent and the contractility of the bladder improved so that the residual urine was less in quantity. But, after all, there was only amelioration and not permanent cure, and comparing the results of castration with those of other methods it was doubtful whether the advantages of it were worth the sacrifice."

The mental state of the patient, resulting from the change in his relations to society, must also be considered.

*Effects of Castration on the Osseous System.*—Becker‖ has made some very interesting observations upon the effects of castration on the osseous system. His material consisted of the skeleton of a colored eunuch and the pelvic bones of another. These he compared with the skeletons of two colored males upon whom the operation had not been performed.

The general structure of the skeleton is slender as in the young negro. Ossification is delayed. This is true of the skull, the vertebræ, and the extremities, with the shoulder and pelvic girdles. The sutures and epiphyseal lines are very clearly retained and present the condition found in very young individuals. In Gruber's¶ case the normal ossification of the hyoid bone was absent. The bones in general are very long, making the skeleton very tall. The same thing is observed in the ox and the gelding, both of which have long extremities and high withers. The relations of the lower to the upper extremities are analogous to those found in the young individual. The same is true of the relations of the forearm to the arm and of the legs to the thigh. In the pelvis no characteristic changes are found.

These results confirm those of Lortet.* He performed an autopsy on an Egyptian eunuch about twenty-five years old. The length of the long bones was considerably increased. This was especially marked in the lower extremities. It has been shown experimentally that the hind legs of the castrated rabbit are abnormally long. In the capon the foot is elongated. It is especially the hind legs of the ox that are elongated. As a result the line of the back is horizontal instead of descending as in the bull.

*Effect of Castration on Sociological Conditions.*—Castration has been employed in some countries as a method for the punishment of crime. Asexualization for the limitation of disease and the prevention and punishment of crime has been urged to some extent at the present time. It has been maintained that the castration of chronic criminals, sexual perverts, and hereditary defectives would benefit society and elevate the human race. It has been proposed as a substitute for capital punishment and as a means of preventing the propagation of criminals. "The pleading of Brower,† that asexualization is the most promising means of reducing crime, has been put on a practical basis by the suggestion of McCassey that criminals, especially those imprisoned for rape, should be offered their liberty at any time on condition of submitting to castration previous to discharge."

The editor of the Philadelphia *Medical Journal*‡ apparently favors legislation along this line, as may be judged from the following:

"As we ascend in the social scale, with the present state of society, especially in the large cities, the number constituting a family becomes smaller and smaller. It requires no mathematician to discover that the shiftless, the thriftless, the indigent poor—the class which produces, relatively, the greatest number of criminals and paupers, if not of the mentally deficient—are increasing out of all proportion to the thrifty, the well-to-do, the class which produces relatively few of the paupers and criminals."

Two causes for this may be assigned. The growing dislike on the part of parents of the upper and middle classes to be burdened with numerous children and the lavish free treatment by hospitals, dispensaries, and lying-in institutions to all who apply. "Never was such organized or persistent effort put forth to save the weakling, the physically incompetent, those who with less care would perish in the battle for life.

"This effort at saving life is well, it is our duty; but it has its evil consequences. Parents relieved from much that is onerous in child-rearing are encouraged to beget others of their kind. Thus is beginning a multiplication of the indigent population which threatens serious consequences for the future.

"If the confirmed criminal, the pauper, the degenerate, those who have ceased to have a regard for law and the consequences of their own acts, must be supported by the state, then society certainly has the right to say that such at least shall not propagate their kind. It is stated that Michigan has legalized asexualization for certain of these unfortunates. Other States and countries will in time follow her example.

"Asexualization will be held by some to be a harsh measure, but it becomes incumbent upon those who would discourage it to offer something better, for the future will compel us to act. Regulation of the marriage law would be ineffectual, because these lower classes have ceased to have respect for the law and the consequences of their own acts.

"If society by her philanthropic efforts is forced to annul the law of the survival of the fittest, then self-interest, nay self-preservation, will compel her to adopt measures that will prevent the multiplication of those who at best can only add degeneracy to the race."

### IV. Effects of Castration in Women.

Advances in gynecological pathology have made castration a much less common operation than it has been in the past. Many conditions formerly considered pathological are now recognized as normal. Regeneration and restoration of function follow more conservative operations in large classes of cases in which radical procedures were formerly considered necessary.

It is difficult to get accurate data concerning many of the remote effects of castration "because women are naturally reticent about matters of sex." Many of the patients are ignorant and unable to give intelligent accounts of their condition.

The classification of the effects of castration here adopted is that of Pfister.* Many of the ingenious applications of Pflüger's theory also are his.

*Influence on Menstruation.*—Before considering the effects of castration upon menstruation a brief consideration of some of the theories of menstruation is necessary. According to Pflüger's theory menstruation is the result of ovulation. The ovarian nerve endings are stimulated by the enlargement of the Graafian follicles in the ovary. The nerve supply of the ovary is very abundant, and the presence of ganglion cells has been described. The ovarian nerves have their centre in the lumbar region of the spinal cord. In this centre a summation of these stimuli takes place. The enlargement and bursting of the Graafian follicles is a continuous process. When the summation has reached a certain degree the stimuli are reflected to the vaso-motor apparatus of the uterus and ovaries. Meanwhile changes have been going on in the uterus. There has been formed the decidua menstrualis. This consists of a loose, succulent, and very vascular tissue. When the stimuli are reflected to the vaso-motor apparatus of the uterus a state of marked hyperæmia is brought about. Under the influence of this hyperæmia the capillaries burst and the menstrual flow is established.

The stimulus caused by the enlargement of the follicles has been replaced experimentally by artificial means. The injection of sterile gelatin into the ovaries of bitches is said to have caused an immediate onset of the symptoms of rut.

In addition to its function of ovulation the ovary probably furnishes also an internal secretion, to which the cause of menstruation has been attributed. Of the existence of this secretion, however, there is no absolute demonstration, such as, for instance, the internal secretion of glycogen in the case of the liver. The assumption that it possesses this function rests upon the striking anatomical and physiological homologies existing between the ovary and the internal secretive glands, and upon the disastrous results which follow its removal during the period of its functional activity. It may be that the function ceases also at the menopause, and that many of the associated symptoms are due to its discontinuance.

More tangible evidence of the internal secretive function of the ovary is furnished by the experiments of Curatulo.† After castration he found the phosphates ($P_2O_5$) in the urine greatly and permanently reduced in quantity. These results have been confirmed in man.

The beneficial effects of castration in cases of osteomalacia appear to be explained by these experiments. By the removal of the ovaries the excretion of the phosphates, which so largely constitute the inorganic, rigid portions of bone, is diminished. In this disease, however, no constant gross or histological changes in the ovaries have been described.

To what is to be attributed the periodicity of menstruation? Pflüger's theory offers an answer to this question also. If a ripe follicle chances to be present when the

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* Frisch, "Die Krankheiten der Prostata," in Nothnagel's "Specielle Path. u. Therapie," xix., 1899.

* The German word *Anlage* is variously rendered rudiment, origin, beginning, basis, foundation, fundament.

† Hoffman, "Beiträge zur operativen Behandlung der Prostatahypertrophie." Beiträge zur klinischen Chirurgie, xix., 541, 1897.

‡ Frisch, "The Remote Effects of Operative Treatment in Hypertrophy of the Prostate." Thirteenth Internat. Med. Congress, August, 1900. Reported by Phil. Med. Journ., vi., 325, 1900.

§ Lequeu, *Ibid.*, 326.

‖ Becker, "Ueber das Knochensysten eines Castraten." Arch. f. Anat. u. Entwickelungsgesch. 83-112, 1899.

¶ Gruber, quoted by Becker, *Ibid.*

* Lortet, "Allongement des membres inférieurs du à la castration." Arch. d'Anthrop. Crim., xi., 361-364, 1896.

† Johnston, Am. Year-Book of Med., 519, 1900.

‡ "Crime, Pauperism, and Mental Deficiency." Phil. Med. Journ., vi., 427, 1900.

* Pfister, "Die Wirkung der Castration auf den weiblichen Organismus." Archiv f. Gynäkologie, lvi., 553, 1898.

† Curatulo, "Influence of Removal of Ovaries on Metabolism in Connection with Osteomalacia." Obst. Trans., London, xxxix., 58, 1897.