HERBIVOROUS.	BRYANT'S TABLE IV. DUCTLESS GLANDS.			CARNIVOROUS.
	Minus Plus	Genital Hypophysis	Plus Minus	
Small. May be large or cystic; adiposis, gigantism, acromegaly.				Large, reproductive functions +. Variations slight.
Usually large.	Plus	Pancreas	Minus	Usually small.
Calcium balance normal	Plus	Para-Thyroid	Minus	Tetany not infrequent.
Normal or large.	Plus	Thymus	Minus	Usually deficient, may be very large.
Myxoedema	Minus	Thyroid	Plus	Exophthalmic goitre.
Always large, especially cortex	Plus	Supra-Renal	Minus	Always small, vagotony frequent.

of the paretic form of neurosyphilis. Perhaps the principle should be extended to other forms of neurosyphilis.

Such ideas should be developed and extended in several directions, such as that of the anthropological and psychological study of types of character in neurosyphilitics. For instance, we need more knowledge in the more general direction of character-types in Bryant's human carnivores and herbivores, of which there is already some suggestion in Bryant's tabulation. Bryant, in fact, states that the genital glands in his "carnivorous" type are large and the reproductive function in excess; the reverse, he states, holds true of his "herbivores." In evaluating such ideas, it must be remembered that most human beings are more or less evenly balanced between these so-called "carnivorous" and "herbivorous" factors.

At this point Bryant's Table IV may be reproduced, suggesting as it does certain possibilities as to ductless glands in the so-called types. We are doubtless far from able now to suggest differences in the mutual control of these glands, based upon their superior or inferior development.

As to forms of syphilis itself, Bryant believes that the carnivores are more subject to paresis and tabes, the herbivores to ulcer and gumma.

A further possibility of research lodges in the systematic study of brain pattern in paretics to learn whether the original brain plan possessed by paretics is simpler or more complex than normal. Annie E. Taft and the writer have been attempting to develop a method of stating approximately the degrees of complexity in various brain patterns, using the material of the State Board of Insanity as embodied in its large and perhaps unrivalled collection of brain photographs. The details of our method (counting sulci through a window of given size) are to be published elsewhere. I present a table in which certain differences between the complication of pattern in brains in general and that of paretics are shown.

(To be concluded).

Medical Progress.

NINTH REPORT OF PROGRESS IN ORTHOPAEDIC SURGERY.*

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(Concluded from page 25).

FOOT CONDITIONS.

Recently there has been much to lead us to look with more interest upon the flood of foot troubles that occur. The foot as a factor in human efficiency (Tyrell¹) is being recognized industrially, and on the other hand, war has made it necessary to give the greatest attention to the care and treatment of feet in marching (Schuster²). Hygienic shoeing and the modern shoe in its influence upon the foot have been considered by various authors without definite conclusion. The weak and flat foot (Packard,³ Marshall⁴) is looked upon by some as a symptom of general arthritic, postural or vascular conditions. It is undoubtedly true that attention to the prevention of these vascular, postural and arthritic conditions with the proper choice of shoes and care for the simple hygienic foot conditions would be sufficient to eliminate a part of the foot deformities that are so hard to relieve. Undoubtedly the feet should be considered from the engineer's point of view (Rowell⁵), and the complicated arrangement of bones and muscles offers much for discussion. At the end we may find ourselves studying and considering the individual and his particular type of foot.

Steindler's⁶ work on the architecture of the tarsus is deserving of very careful study by all those interested in deformities of the foot.

In considering the operative aspects of certain foot troubles (Freiberg⁷) the fact that muscle spasm can nearly always be relieved by rest should make one reluctant to subject the patient to conditions worse than static. Rest without the suspension of function may often be obtained by mechanical or therapeutic measures.

Hibbs⁸ observes that few people are willing to indulge thoroughly in the healthful exercise of walking, and believes this results in their muscle bound feet, due to a limitation of dorsal flexion. He makes a skin incision at the outer edge of the Achilles tendon, splits the sheath, and lengthens the tendon by longitudinal cut and holds it with sutures. He lays especial stress upon the after-treatment of three months in children and six months in adults. The foot is held in plaster, dorsally flexed for three weeks. Then walking, resist-

* This report is based on a review of 488 articles selected from about six hundred titles having to do with orthopaedic surgery appearing between August, 1914, and January, 1915. References are given to only such articles as have been selected for note and comment.

ant exercises to develop the anterior group of muscles, and in adults, ankle braces with stop catches are used. Thirty-eight patients have been treated in this way and in all the function of the foot has been so corrected that they walk normally and without pain. Comparing the results with those treated by conservative measures, he says that only by operation can satisfactory results be obtained and a normal muscle balance be assured.

(ED. NOTE: The editors' experience has not led them to believe that this should by any means represent a routine operation, but that its importance has been perhaps overestimated.)

In the discouraging forms of rigid, spastic flat foot, repeated forcible correction under ether has often failed on account of the indisposition of the patient to carry out the after-treatment. Saxl¹⁸ uses local anesthesia for this, injecting 2 to 4 grams of 1% cocaine or novocaine solution into the astragalo-scapoid joint or peroneal tendons. Various methods of quieting the muscle spasm by nerve paralysis or gradual manipulation seem to have no advantage over the complete relaxation in ether narcosis, which allows the foot to be most easily held in correct position when the plaster is applied.

In advocating the more general use of linear osteotomy in bone deformities, Bradford¹⁹ is strongly in favor of this method instead of removing the head of the first metatarsal bone in hallux valgus. Forcing the osteotome through the tissue to a point on the bone just above the distal end of the metatarsal, he cuts through the bone and forcibly fractures the outer shell, leaving a gap at the outer side to be filled with organizing blood-clot and thus correct the valgus. Avoiding the extensor tendon, the bone can be divided near the joint, and the lateral deformity corrected without interfering with the weight-bearing qualities of the foot.

Katzenstein²⁰ induces hardening and shrivelling of over-stretched and relaxed ligaments responsible for flat foot and other deformities. He discovered by accident the effectual action of the tanning process which he employs and then proceeded to apply it systematically. He uses injections of formaldehyd under local anesthesia into the stretched ligaments. A plaster cast is then applied to hold the ligament in its contracted position. When the cast is removed after three or four weeks, the ligament is firm and hard. He gives an illustration of an apparently almost normal child of five cured of "extreme flat feet and inward bowed legs." He injected the formaldehyd into the tibionavicular ligament and into the median lateral ligament of each knee, with a plaster dressing for the three joints. He thinks that relaxed ligaments are the cause of deformity of bones far more often than is generally recognized. By detecting the loss of elasticity early it may be possible to ward off deformity and correct it by restoring the pull of the ligaments.

(ED. NOTE: This so-to-speak causal treatment of deformity seems to render apparatus superfluous. We have, however, seen no report of the results of this treatment in other surgeons' hands. We wonder whether this artificially produced hardening and shortening is likely to be permanent).

RICKETS, OSTEOMALACIA, FRAGILITAS OSSIUM.

Considering the etiology of rickets from two opposite points of view, the conclusions are very similar. Curle,²¹ from his clinical experience, states that the two chief factors in the cause of rickets

are the preponderance of carbohydrates in the diet and a lack of pure air. Koch²² injected the streptococcus longus into young animals and an acute infection followed at once, gradually developing a chronic disease of the bone, apparently similar to rachitis in man. He also says that the dogs allowed to run about freely did not develop the bone trouble, or at least not in the same degree as those kept in stalls. His experiences suggest the injurious influences of secondary infection after the process of normal ossification has been upset by the acute infection. He does not believe any one organism is associated with rachitis and recognizes the importance of any factor that lowers the general bodily resistance for a long time.

Cavarzini²³ adds another to the 46 cases on record in which systematic epinephrin treatment cured osteomalacia. At the same time he cites 26 cases that have been reported in which little or no benefit was derived from the treatment. In some of the cases the epinephrin was stopped at the first sign of intolerance, so that the treatment had really no chance to display its efficacy. The hypophysis seems to be able to sensitize the adrenals, and hence combining hypophysis extract with the epinephrin treatment might enhance the action of the latter. He adds that there is much to sustain the assumption that deficient functioning of the adrenals interferes with the normal growth of the skeleton.

Every year more new cases of osteogenesis imperfecta are recognized and the number now well studied is over fifty. Glandular and medicinal treatment seems to be of little avail. Among others, Schabad²⁴ carefully analyzed the metabolism in a case and gives his conclusions. The calcium retention is below normal and the deficiency is best met by the administration of phosphorus and cod liver oil. The injection of calcium is of no advantage. Phosphorus excites a hyperphosphaturia in osteogenesis imperfecta in contradistinction to the hypophosphaturia seen in rachitis.

Ostheimer²⁵ has collected 193 of these cases under the title of fragilitas ossium, a name expressing the chief clinical symptoms, but making no attempt to express the specific cause. Whatever name may be given to this condition, it is to be remembered that the prognosis is nearly always fatal and that we have no definite line of treatment to follow at present and can only hope for guidance by the careful metabolic study of these cases.

BONE GRAFT, BONE TRANSPLANTATION, PERIOSTEUM, ETC.

The operative treatment of tuberculosis of the spine has had sufficient trial to allow one to make a judgment in its favor. Of 39 cases treated at the Mayo Clinic (Henderson²⁶), the Albee method was used in 33; the Hibbs in 6. The oldest case was 52 years and only five were children. One-half were lumbar or low dorsal region, only one was above the mid-dorsal. Without going into detail it can be said that the results were very successful, nearly 75% being improved or cured with no operative fatalities.

(ED. NOTE: The great advantage of shortening of the treatment and hastening the cure of the disease is offered as a strong claim in favor of this procedure. Undoubtedly it does make the treatment more thorough and efficacious and thus hasten the curative healing process, but it does not, in our opinion, warrant any radical shortening of the protective treatment.)

Henderson lays stress on this point in keeping the patient in bed after the operation for one to six

months and insisting on a brace being worn for one year, preferably one year after cessation of all symptoms.

Ryerson¹⁴ reports 37 cases of Pott's disease from his clinic, in which the Albee operation has been performed, and considers that the method has earned for itself a distinct place in the treatment of spinal tuberculosis and that it can almost be classed as the acme of conservative treatment.

In fractures and fracture-dislocation of the vertebrae, Palmer¹⁵ has tried, with success, the use of bone graft. He thinks that laminectomy should be done in all cases where there is deformity and paralysis, and that at the same time a bone graft may be inserted that will obviate the necessity of wearing a jacket or brace.

In a case of recurrent spondylolisthesis, Ryerson¹⁶ reports a fairly successful result. A young girl of fifteen, carrying a child in her arms, felt a sudden pain in her back and fell to the floor in a faint. Temporary paraplegia developed a week later, and subsequent weakness and numbness in the legs recurred during the next year. On examination it seemed that the fifth lumbar vertebra was capable of being displaced and it was decided to hold this in place with a bone graft. A second operation was necessary to secure firm fixation of the upper end of the graft. This bone splint from the third lumbar to the third sacral segment served to relieve the symptoms.

Galloway¹⁷ reports the encouraging results of bone grafting in a case of paralytic scoliosis, but admits that it is too early to judge of its ultimate success.

The function of the periosteum in the regeneration of bone has been the field of much experimental study. According to the research of Moore and Corbett¹⁸ it is to be disregarded in all bone operations. If convenient, it is to be preserved, because conservation of tissues should be the rule in good surgery, but one should not hesitate to sacrifice it, if necessary.

On the other hand, Haas¹⁹ says that periosteum is directly and actively concerned in the regeneration of bone. This regeneration also takes place from the marrow, but at a later period and in a more limited degree than from the periosteum. He performed 57 experiments upon the ribs and costal cartilages of rabbits. His deductions as regards regeneration of bone are limited to the bones that arise from cartilage.

Furthermore, as a result of their study, Davis and Hunnicutt²⁰ conclude that free periosteal transplants did not produce bone in the large majority of experiments, nor did pedunculated flaps of periosteum. On the other hand, free periosteal transplants and pedunculated periosteal flaps with bone attached produced bone in each experiment. The removal of the periosteum seemed to have little, if any, effect on the nutrition of a bone. After subperiosteal resection of a portion of a bone, the growth of the bone in repairing the defect was from the bone stumps, the periosteum acting as a limiting membrane.

In this confusion of ideas it may be remembered that to strip the periosteum entirely free from any of the cells of the cortex is a difficult task and the exactness of the experiments may be questioned. The conclusions of Phemister²¹ in his studies on the fate of transplanted bone may be accepted as expressing as clearly as possible our present understanding of this question.

"Osteogenesis and bone repair occur through the inner layer of the periosteum and endosteum, and to much less extent, through the bone cells and fibrous contents of the Haversian canals." Viability of the transplant depends largely upon its ability to get nutrition which is suited to it, and this point he explains in detail according to the different demands of membrane and bone. According to Roux's law of functional adaptation, the bone transplant placed to fill a bone defect undergoes progressive changes, while in soft parts retrogression and disappearance take place. Axhausen's claim that osteogenesis does not take place through bone devoid of periosteum and endosteum is incorrect. The subsequent fracture of the piece of transplanted bone has been found healed by a well formed callus. When bone is transplanted in soft tissues there is no functional demand for the bone, and there is no more tendency for it to form than when periosteum is so transplanted. In any case, it is best to use the transplant with both the periosteum and endosteum intact.

Mayer and Wehner²² after a careful experimental study, emphasize the osteogenetic function of the specific-osteoblastic cells of the periosteum and the inability of the adult bone cell to form new osseous growth. Bone macroscopically bare of periosteum can be successfully transplanted into the soft parts, not because the bone cells give rise to new bone formation, nor because of a metaplasia of the surrounding connective tissue cells into osteoblasts, but because of adherent periosteal cells and of living endosteal cells.

SCOLIOSIS.

The Second Report of the Scoliosis Commission,²³ appointed by the American Orthopaedic Association, is important. This Commission during its first year of existence, studied the results of the treatment of lateral curvature by various forms of plaster jackets, attempting to use the records of the different orthopaedic surgeons. These records in almost all cases they found to be unsatisfactory, and this second report records the results of six months' treatment of structural cases in four different clinics, all of the records having been taken in standard and identical fashion by the Commission themselves, both before and after the treatment. These clinics were those of Lovett, at the Children's Hospital, Boston; Abbott, at the Children's Hospital in Portland, Maine; Kleinberg, at the Ruptured and Crippled Hospital in New York, and Adams and Danforth at the Massachusetts General Hospital in Boston. They also memorialized all members of the American Orthopaedic Association and asked them whether they had themselves over-corrected any cases of structural scoliosis by any method. Six answered that they had, but none of them on further investigation were able or willing to offer evidence that such was the case, and since the completion of the report, the one definite and unqualified claim of cure in undoubtedly structural scoliosis referred to in the report of the questionnaire, has been retracted by letter to the Committee. We print certain of the findings of this Commission, which was an entirely impartial one. All its members were eager to discover a method by which this resistant deformity might be over-corrected, or even corrected, with a reasonable degree of safety and a fair degree of constancy.

The following summary is offered as the result of the investigation of the second series of cases:

1. No case of *over-correction* of the elements of deformity in structural scoliosis has been presented to the Committee, in which they have been permitted to observe and record the condition of the patient from a time preceding the beginning of treatment.

2. The time allowed by the Committee has been sufficient, in their judgment, for such a demonstration, were it possible in the respective patients and by the respective methods.

3. The same statements may be made with respect to complete correction of the elements of deformity.

4. The amount of correction demonstrated to the Committee by means of the method of Forbes is unsatisfactory and is to be regarded as an entirely insufficient reward for the amount of labor, discomfort and other inconvenience which is involved.

5. In mild cases of undoubtedly structural scoliosis, and perhaps in some moderately severe cases, considerable degrees of correction may be achieved by means of the method of Lovett, Abbott and by Kleinberg's brace.

6. It seems probable that greater degrees of correction may be obtained with the flexed position of the spine than with the extended position of the spine.

7. It does not appear that the use of extreme force is justified by the results which are to be obtained from it.

8. In order to have reciprocal application to the given case, all records should be made with the patient in the same position; this refers to the clinical, photographic and roentgenographic record and to the horizontal or upright position of the patient.

9. For purposes of record the upright position is to be preferred.

These findings should give us pause in employing excessively severe methods and at the same time should stimulate our endeavors to relieve this baffling condition.

FRACTURES.

Among the interesting cases that come to the orthopaedist for treatment of back strain are the often unrecognized fractures of the transverse processes of the vertebrae.

Among the 116 cases of back pain following injuries, Ewald¹ has observed four cases of isolated fracture of one or more transverse processes. In two cases a direct injury was reported, for the others a similar mechanism is supposed, since Ewald doubts the generally accepted mechanism by muscle pull. The typical symptoms were present in all cases: local tenderness, pain in bending over to the unaffected side and in rising to an erect position from the flexed position, in lifting of the legs from lying, and in going upstairs, lateral deviation being toward the good side. The diagnosis can be made by the x-ray only. Prognosis is favorable. Plaster strapping, or a wide webbing belt, is sufficient treatment.

In an article urging the use of plates in fractures, Raynaldo dos Santos² reports a case of separation of the anterior tuberosity of the tibia in a young man, by a sudden muscular contraction. The tuberosity was pushed down and the fragment held in place by the use of two plates. A perfect functional result was obtained.

(ED. NOTE: A great variety of plates and screws, made of various metals, ivory, live and dead bone, are used in fixing fractured fragments. The results seem to be equally good under these different methods and each operator has his special favorites to which he has become accustomed and with which through his skill in their use he obtains the best results. The auto-bone graft, when available, should give the best result.)

Associated with the odd fractures that are seen in orthopaedic practice are the traumatic disturbances of nutrition in the semilunar bone. After discussing our present knowledge of those peculiar affections of some carpal bones, as have been described by Preiser for the scaphoid and Kienboeck for the semilunar, Frenkel³ reports two such cases of so-called "Kienboeck's disease of the semilunar bone, one case a housemaid of 25 years, and the other a carpenter of 30. In the history of the second case there was evidence of an injury, which was proved by the x-ray picture, four and one-half years after the accident. The original picture had shown a fissure of the radial epiphysis only. In both cases the clinical signs consisted in limited motion of the wrist, pain in motion, and tenderness over and near the semilunar bone. X-ray pictures showed an irregular structure, some parts being more, some less, dense than normal; also flattening and reduction in size. In one case a microscopical examination was done which showed a compression fracture secondary to a primary disturbance of the nutrition of that bone. There seems to be a certain similarity of these affections with those known as Koehler's disease of the tarsal scaphoid.

BACK STRAIN.

There have been published many articles on the subject of backache. Such a broad title includes nearly the whole scope of orthopaedics, from the foot to the top of the spine.

Beyond the pathological lesions that cause definitely localized pain in the back, there are other conditions that must be differentiated and more care given to their diagnosis. The importance of poor posture and the related visceroptosis is recognized. Attention is called to these facts by Ogilvy,⁴ when he insists that the patient should be more carefully examined and a more definite diagnosis made. The importance of muscle strain due to bad balance of the body is emphasized. There is perhaps little new in what he writes, but the field is open for important study of the mechanical strains of the body structure.

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President's address:

PASTEUR.

DR. GERALD B. WEBB of Colorado Springs, Colo., made this address, in which he stated that in re-reading Pasteur's life it had occurred to him that they as immunologists could not hear too often or too much of this, their greatest master. Pasteur's advice to the students of the University of Edinburgh was, "Worship great men." He agreed with the anonymous writer in the *Spectator*, "that he was the most perfect man who had ever entered the Kingdom of Science." He reviewed the early history of Pasteur, showing that he was fortunate in his parents, having a father that was reserved and of a slow and careful mind, and a mother, active, full of enthusiasm, and of imagination. He was equally fortunate in choosing a wife who was willing that the laboratory should be put before anything else. The speaker dwelt on Pasteur's work on fermentation, and his discoveries with reference to the disease of yeast and of the silk worm and of what these meant to the wine, beer, and silk industries of France. He reviewed the other discoveries of this great scientist which were familiar to them all. In speaking of Pasteur's attitude during the Franco-Prussian War, he said that he was unable to concentrate on his work and wrote, "This war has sent my brains to grass." Later he wrote, "Might and right struggle for the world; right which constitutes and preserves society; might which overcomes nations and bleeds them to death." His writing on the psychology of war and his description of the horrors he witnessed formed a counterpart of similar crimes reported recently, and in choosing a discourse on this subject he wrote, "But we may assert that French science will have tried by obeying the law of humanity to extend the frontiers of life." In 1874 Tyndall, after thoroughly investigating Pasteur's experiments, wrote, "For the first time in the history of science we have the right to cherish the sure and certain hope that, as regards epidemic diseases, medicine will soon be delivered from quackery and placed on a real scientific basis. When that day arrives, humanity, in my opinion, will know how to recognize that it is to you that will be due the largest share of her gratitude." After relating still further the discoveries of Pasteur, Dr. Webb stated that it is not generally known that the first experiments in "carriers" dated from Pasteur.

Pasteur was much more forceful than his biographers had indicated. He rarely visited a theatre or went out socially, feeling like the philosopher who said, "I am never bored but when I am being entertained." Pasteur read only what was good, and especially selected biographies. His advice to students should be emphasized: "All experimental research must be guided by some preconceived ideas. Exhaust every possible combination, until the mind can conceive no other possible. It is indeed a hard task when you believe you have found an important scientific fact, to constrain yourself for days, weeks, years sometimes, to fight with yourself, to try to win your own experiments, and only proclaim your discoveries after having exhausted all contrary hypotheses."

In closing, Dr. Webb advised his hearers to read the life of Pasteur by Vallery-Radot, a book which he described as reading like a fairy story, and one which should be memorized by all.

Reports of Societies.

AMERICAN ASSOCIATION OF IMMUNOLOGISTS.

STATED MEETING, HELD MAY 10, 1915.

(Continued from page 25)

The President, DR. GERALD B. WEBB, Colorado Springs, Colo., in the Chair.

The Second Annual Meeting of this Association was held at the New Willard Hotel, Washington, D. C. After the meeting of the Council the scientific program was taken up.