slightest attempt to bring it forward or sideways. Kernig's sign was positive. He had projectile vomiting. He had also the following symptoms: herpes labialis, tache cerebrale, decided deafness of left ear, coated tongue, temperature 99.5, pulse 100. Inasmuch as no infection had been known to precede this outbreak, the diagnosis of cerebro-spinal meningitis of the epidemic type seemed probable. I called up Dr. Ebright, and recited the symptoms. He agreed with me upon the provisional diagnosis, and suggested that we go prepared to inject Flexner's antimeningitis serum if we should get turbid fluid upon doing a lumbar puncture. Consequently, we met December 27th and performed a lumbar puncture, obtaining as we had expected very turbid fluid. The cerebro-spinal fluid was under a pressure of 25 mm. of mercury. We withdrew 45 c. c. of spinal fluid very slowly, and thereafter injected 45 c. c. of Flexner's serum with a large Leur syringe. All the symptoms of the preceding day were present to about the same extent. The temperature was 101. On microscopical examination of the centrifuged fluid, we found large numbers of the diplococcus intracellularis, which were Gram negative. There was at this time a leucocyte count of 14,200 per cu. m. The differential count showed 90% of polynuclears. On December 28th we met in consultation, and some amelioration of the symptoms of the preceding day were found. He had had a somewhat better night. The headache was considerably better. He felt hungry. Temperature was 99.5. We withdrew 30 c. c. of spinal fluid and injected 45 c. c. of Flexner's serum. At this operation, the cerebro-spinal fluid was under considerably less pressure than the preceding day. On December 29th the lad felt much more comfortable, the spasticity of the muscles having relaxed to some extent. The temperature was normal. The deafness seemed less. Sleep on the preceding night had been more restful. In general, he felt much better. The Kernig symptom remained the same. We decided to await developments in regard to administering more serum.

December 30th, the patient felt far more comfortable; he had had a good night; headache was gone; the spasticity was somewhat less; appetite was good, and he felt fine.

December 31st the headache again returned and the temperature rose to 102. The symptoms were now about the same as at the time of the first injection. I asked Dr. Ebright to procure more serum, and January 1st we met again and withdrew 45 c. c. of turbid cerebro-spinal fluid, after which we injected 45 c. c. of Flexner's serum, this time introducing it simply by gravity, using a small funnel. The temperature this morning was 101. Quite a considerable aching in the thighs and head usually resulted from the injections, these symptoms lasting one or two hours. The pressure of cerebro-spinal fluid was at this operation 15 mm. of mercury.

On January 2d the patient felt very much better; the headache had gone and the temperature had declined to 99.2. We withdrew 45 c. c. of turbid spinal fluid and injected 30 c. c. of Flexner's serum. It was remarked daily that the turbidity of the cerebro-spinal fluid was decreasing.

On January 3d we found normal temperature and pulse. The spasticity was slightly improved, but there was still very marked retraction of the head. The Kernig sign remained about the same.

On January 4th there were normal temperature and pulse. Lumbar puncture was performed, and we withdrew 40 c. c. of clear spinal fluid, which gave negative growth on culture media. We injected 30 c. c. of Flexner's serum. The Kernig symptom remained the same.

January 5th, we found normal temperature and pulse.

January 6th an urticarial rash appeared on several parts of the body, but only lasted about forty-eight hours. From now on there was a gradual recession of all symptoms. For some time after he had quite a marked dilatation of the pupils, so as to be quite unable to accommodate for any close reading, but are now normal. There is still some slight deafness in the left ear, but he states that he thinks it is improving. He is otherwise entirely normal. I used 30 grains a day of hexamethylenamin for about a week after discontinuing the serum as a disinfectant of the spinal fluid.

We injected in all 195 c. c. of Flexner's antimeningitis serum in five sittings, and after each injection we noted very decided improvement. The result was decidedly gratifying, and in review of the case I am impressed that the positive antidote of diplococcus intracellularis toxin was being used and was acting just as decidedly as could be seen in diphtheria when using antidiphtheretic antitoxin.

RENAL TUBERCULOSIS.*

By GEORGE S. WHITESIDE, M. D., Portland, Oregon.

In presenting to you such a hackneyed subject, I would call your attention to the fact that in consequence of the effort to be original and present unusual or novel ideas, nowadays, we often forget that what is common rather than rare, what is routine rather than new, what is accepted practice rather than original research, may be a useful subject to occupy our minds.

The brilliant investigations and startling innovations in medicine mean progress, but after all the work of the world depends upon the intelligent and skillful handling of routine problems. I believe also that individual experience in practice deserves expression in papers before our medical societies. Medicine is not yet an exact science and the pictures of disease in its common forms are differently interpreted by each of us. It is occasionally good to exchange ideas that bring out these differences of opinion in regard to both theory and practice.

In the very common form of visceral tuberculosis which I wish to consider to-day, much has been done of late years tending toward accuracy in diagnosis. The cystoscope and ureter catheterization have replaced the trocar in giving us an easy, sure and harmless method by which the excretory effort of the kidney in question may be judged. I will not waste your time by describing methods which, having overcome the prejudice that existed against them ten years ago, are now considered essential to a proper investigation of any surgical kidney affection. I believe to-day it would be considered as careless of the best interest of our patient not to obtain the separated kidney urines and investigate the functional possibilities of each kidney before beginning treatment of a tubercular kidney as it would be to try to treat a case of pulmonary phthisis without auscultation of the chest. I think those few who might deny that such is the case place themselves in the small class of practitioners who do not use the microscope or the clinical thermometer.

On the other hand many extravagant claims have been put forward for the special diagnostic method of ureter catheterization which tend to discredit its general applicability. It is not advisable for the general practitioner to attempt to practice it. The instruments are expensive and fragile. Their use requires constant practice. The interpretation of

* Read at the annual meeting of the Pacific Coast Branch of the American Urological Society and the California State Society, April, 1910.

the results obtained requires a large special experience just as truly as does the interpretation of the results of the use of the X-ray. Ureter catheterization and cystoscopy by an expert often, but not invariably, reveal much valuable accurate information in renal cases, and just as truly often lead to misinformation in the hands of the novice or inexpert. However, the experts should be careful not to claim more than is reliable and true. For instance, at the meeting of the American Urological Association at Atlantic City in 1909, I heard it stated, by a very enthusiastic diagnostician, that if a quantity of normal salt solution were injected through a ureter catheter into the renal pelvis any quantity less than 30 c.c. which seemed to fill the pelvis proved no dilatation, and any possible more than 30 c.c. showed an abnormal capacity proving hydro or pyo nephrosis. I wish this degree of accuracy were possible, but I believe adherence to any fixed rule will surely lead to frequent error. Many kidneys are somewhat dilated or dilatable without interfering with a practically normal functional ability. One should not claim too high a degree of accuracy in this method of diagnosis. Another method of determining the capacity of the renal pelvis is by the injection through the ureter catheter of a strong solution of argyrol or of a suspension of subnitrate of bismuth, and then an X-ray plate will show the relation of the metallic solution in the pelvis to the entire kidney. This method often reveals the extent of destruction of tissue in renal tuberculosis and so checks our estimation of the functional ability of that kidney by the phloridzin method.

In renal tubercle it is often impossible to demonstrate the bacilli under the microscope. Pus is apt to be abundant and often blood, mucous and the detritus thrown off by the disordered kidney conceals the micro-organisms which are present, rendering their detection difficult. In such cases guinea pig inoculation is an invaluable aid. In very early cases where the urine is abundant and contains few bacteria a guinea pig inoculation will frequently give us the only positive evidence of beginning disease. Other diagnostic methods are familiar to genito-urinary surgeons and general practitioners alike. The acid, purulent urine, the renal enlargement, which can often be demonstrated, the pyrexia, chills, loss of weight, sweats, etc., etc., are the ordinarily accepted symptoms present in this disease.

Let us remember how very common renal tuberculosis is and be constantly on the watch for it, either as a primary localized infection or as secondary to disease elsewhere. An early diagnosis will save many a patient. In the very early cases tuberculin should be tried in treatment. I have repeatedly called attention to the observation that if the bladder is also affected so that we have irritation of its neck, as shown especially by frequency of urination, then this symptom should be used as an index guide while administering tuberculin for treatment. After an overdose vesical irritation is worse and after a proper dose it is greatly relieved. Also when a proper dose has been given and has produced the expected improvement in this way you will find that after a few days the original symptoms of pain and frequency begin to again obtrude themselves upon the patient's notice. Then it is time to repeat the dose of tuberculin. This is a much more accurate guide than the opsonic index and one more easily followed by the busy surgeon. If no vesical irritation exists (which is unusual) then the temperature, pulse, urine and weight charts are our best clinical guides to aid us in both time and quantity of tuberculin dosage.

In regard to the particular form of tuberculin to be employed I myself have had surprisingly good results with Koch's O. T. In fact, I prefer it for general use, although the B. F. seems more mild and efficient in some cases.

As I have said, very early cases may try tuberculin treatment, but do not make the grave mistake of losing valuable time in those early cases where tuberculin proves inefficient. In these and emphatically in more advanced cases operation is the method of choice. I am sorry to acknowledge that this is the case. I believe strongly that destructive surgery is a confession of our limited knowledge. It would be better for the patient to be cured of disease without the loss of so important an organ as the kidney, but unfortunately our present skill is still inadequate. Radical operation on the kidney which has been proved to be the more diseased of the two (in bilateral infections), or the only diseased one (in unilateral cases), is still the method that gives us best results. Nephrectomy has saved many valuable lives, even in cases where there is bilateral disease. In a case I operated upon in July, 1907, both kidneys were tuberculous, the left one produced nothing but thin pus through the ureter catheter. Nephrectomy was immensely successful. In the following six months the patient gained 50 pounds in weight and recovered her health and strength. Since then she has had two slight periods of upset from the infection of the remaining kidney, but the cautious administration of tuberculin for a few weeks has so far averted any serious consequence. I have had a number of other cases in which the result has been perfectly satisfactory. In many of them there is, however, still a small quantity of pus in the urine and the bacillus coli seems to be the offending germ. I have used the stock B. coli vaccine with good temporary results in several cases. In others I could get no improvement until I used an autogenous vaccine prepared from a culture taken from urine obtained by a ureter catheter. In a small number of cases (three in all) tubercle bacilli still persist in the urine from the remaining kidney, and tuberculin treatment proved to only partially control the condition.

In any case where there is a very slight sediment in the urine, which contains mostly pus, and B. Coli infection is proved, it has been my experience that the vaccine treatment will never eliminate the last traces of pus from the urine. Washing out the renal pelvis with argyrol or cargentos is too hazardous a procedure when there is but one kidney, unless it becomes absolutely imperative. It should not be lightly considered as only of equal risk in these cases as it is in individuals who have two kidneys.

In nephrectomy for renal tuberculosis do not make the mistake of trying to operate through too small an incision. I prefer to begin at the twelfth rib and

cut through all structures to the post peritoneal space by a long incision which follows the line of Poupart's ligament to the spine of the pubes. It takes no longer to heal and I have used this incision for years without, to my knowledge, a hernia afterward. Once I operated on a young man with this incision in the spring of the year, and the next fall he played football without a symptom or a bad effect of any sort.

The most troublesome feature of nephrectomy for renal tubercle is apt to be a fistula or sinus leading to the stump of the ureter. I have had a few very persistent cases of this sort, but latterly I have practiced removal of almost the whole of the ureter with the kidney. Since adopting this method, I have been more fortunate in regard to fistulae. I put it this way because I know some of my friends in this association differ with me in this. They assert that a ureter cut very low down near the bladder will often leak urine, infect the cellular tissue and be the nidus for a bad chronic sinus, discharging pus or urine or both. This has not been my experience. I try to close the ureter and also try to draw neighboring tissues over the end of the stump to adhere to it and so prevent leakage. Up to now I have been successful, but I presume some day a bad sinus will prove to me that the conclusion of the majority in this is the best rule to follow.

To sum up then, I would say: Investigate thoroughly, using every means at our command for an accurate diagnosis. In very early cases use tuberculin for a short time to give them a chance to avoid operation, but be careful not to jeopardize their ultimate recovery by trying this too long in those cases which do not immediately favorably respond to tuberculin treatment.

Operation has a low mortality. In fact, it should have none at all, as it is usually possible to avoid shock, sepsis and hemorrhage, which are the three dangers. Operation is often brilliantly succesful in its outcome and usually removes so much disease that the patient's natural resistence can take care of what remains. I have had two deaths months after nephrectomy from phthisis pulmonalis. It seems to me these cases simply demonstrated the value of an earlier diagnosis.

THE CO-OPERATION OF SCHOOL HEALTH DEPARTMENTS WITH OTHER HEALTH AGENCIES.

By ERNEST B. HOAG, M. D., Berkeley.

Medical supervision of schools is rapidly becoming an increasingly important factor in modern education. The necessity for such careful supervision of the health and development of school children is no longer an open question.

Only the most unprogressive communities now oppose this sort of work, and only *careless* communities fail to avail themselves of its advantages. No school can to-day claim an important place in modern educational progress which ignores or neglects the health conditions of its pupils. Like most other new developments, school health supervision methods have evolved from very small, unorganized beginnings. As in most other projects, one community learns very little from others, but each attempts to work out its own problems, thereby falling into the same errors, confronting the same difficulties, and wasting about the same amount of energy. We have to-day no *standardization* of methods, and endless useless discussion results from this fact. In the light of the experience of many progressive cities such standardization in essential matters might now be rather easily established, thus saving an enormous amount of time and energy to towns and cities which wish to inaugurate this work. This paper proposes to discuss only one phase, at this time, of such a standardization.

Most communities have in existence one or several sorts of health organizations, but few of them have attempted to *correlate* the work of these various health agencies. A concrete example of what may be accomplished by such useful correlation is furnished by the city of Berkeley, California, and for this reason this will be presented as typical of what may be done in many other places.

Health supervision was only organized in Berkeley one year ago, and the usual difficulties have had to be met. A good Board of Health is, of course, in existence, and it employs a Health Officer who devotes part of his time to the city work, receiving for this service the moderate compensation of about a thousand dollars a year.

Since the great San Francisco fire of 1906 a small medical clinic or dispensary has been in operation under the direction of three physicians. For several years the Berkeley Charity Organization has also been in operation, under a Board of Directors which employs a secretary and visiting nurse. The medical dispensary was situated on the west side of the city near the manufacturing district, and consequently among the homes of the foreign element. The Charity Organization was situated near the business center.

The Medical Director of Schools was elected by the Board of Education at a reasonable salary to devote the entire school day (from 9 a. m. to 3 p. m.) to the health work of the schools, and was given a suite of offices in connection with the rooms of the Board of Education. An arrangement was made whereby the Charity Organization nurse should devote one-half of her time to that agency and one-half to the city's schools.

It soon became clear that the four health agencies in Berkeley, viz., the City Board of Health, the Berkeley Charity Organization, the West Berkeley Clinic, and the School Health Department were wasting considerable time, energy and money. To correct this condition the following plan was carried into effect:

1st. The rather inadequate Clinic was, after much discussion and with some difficulty, reorganized with a staff made up of fifteen representative physicians, instead of the former small and somewhat exclusive staff of only three.

2nd. The Charity Organization, which had been none too friendly toward the Clinic and had consequently sent many cases to the clinics of the neigh-

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