analyzed and, fortunately, leave no question in our mind as to the diagnosis as they were followed to the autopsy table. All showed marked sclerosis with probable cardiac fibrosis, so that it is not surprising that there was such a large number evidencing abnormal rhythm during some stage of their illness. Auricular fibrillation has not been an unusual finding in our cases of coronary occlusion in the aged, and occurred in one young man (whose usual health was robust) who developed a coronary occlusion following an operation for a gangrenous appendix. Heart block, bundle branch block, may not be a sequel of coronary occlusion but may have existed for some time prior to the occlusion. The same mechanism that causes coronary occlusion oftentimes produces fibrotic changes in the conducting system with consequent block. We have wondered at times whether the change in the circulation of the heart was the cause of abnormal rhythm, as we have seen several patients develop auricular fibrillation of a paroxysmal type following sudden shock or injury: one patient after being badly frightened, one following a fractured clavicle, and two after fracture of the hip. All these patients had exhibited myocardial damage of an appreciable degree with hypertension and arteriosclerosis but no evidence of coronary occlusion at the time of the onset of their abnormal rhythm.

WILLIAM DOCK, M. D. (Stanford University Medical School, San Francisco).—Doctor Leake's carefully studied series of patients who died following coronary occlusion emphasizes the serious import of paroxysmal tachycardia in this condition, for the incidence is always, as in his series, greater in those who are going to die of the disease than in those who survive an attack of this sort. On an experimental basis, both digitalis and quinidin have been shown capable of preventing such attacks of tachycardia, but it is the usual practice to use quinidin. It is now quite clear that patients who have had extreme shock and severe myocardial damage due to coronary thrombosis tolerate quinidin even in very large doses, and I know of no cases in which its use has done harm. The need for it usually arises between the third and fourteenth days after the onset of symptoms. Heart block, either transient or permanent, is likely to manifest itself earlier, but is a less serious complication and requires treatment only when associated with Stokes-Adams seizures.

I believe that the safest administration of quinidin is to begin the drug in doses of 0.3 to 0.5 gram every four to six hours as soon as paroxysmal tachycardia occurs or when ventricular extrasystoles become more frequent than six to eight per minute, and to continue the drug for at least two weeks, regardless of whether the arrhythmia is abolished quickly or not. I should be interested in knowing if Case 13 was still on quinidin at the time of his death. Quinidin, unlike digitalis, has a rather transient effect, and must be given every six hours to keep the heart under its influence. While we cannot expect it to prevent sudden death in this group of cases, it undoubtedly reduces the risk of ventricular fibrillation in the patients with ventricular arrhythmias.

V. R. MASON, M. D. (838 Pacific Mutual Building, Los Angeles).—This timely paper by Doctor Leake calls attention to sudden disturbances of rhythm in patients and to their importance as evidence of disease of the coronary arteries.

It is the demonstration of these minor disturbances as well as the more spectacular phenomena which has led to more early and accurate diagnosis of cardiac disease incident to coronary artery narrowing.

With early and accurate diagnosis it is apparent that the institution of proper treatment will lead to considerable prolongation of life in many instances.

THE PATCH TEST—ITS USE IN DERMATOLOGY*

REPORT OF CASES

By JOHN M. GRAVES, M. D.
San Francisco

DISCUSSION *by Fred Firestone, M. D., San Francisco; Norman N. Epstein, M. D., San Francisco; Samuel Ayres, Jr., M. D., Los Angeles.*

THE patch test was suggested in Europe by Bloch and Jadosshon. Interest has been stimulated in this country particularly by Sulzberger, Wise, Spain, and others.

This test is of assistance in determining the etiology of many cases of dermatitis venenata. Of recent years many attempts have been made to clarify the subject of dermatitis and eczema. Investigation has succeeded in amputating various groups from the old classification. A better understanding of the part played by fungi in the production of dermatoses has removed a large number of conditions from the old eczema group and has established them as distinct entities. With the patch test we are now in the process of segregating another group.

The test itself will probably have a wide use. It is simple to apply, does not require much time, and the results are frequently easily apparent.

TECHNIQUE

The test is performed as follows: The gummed surface of a strip of adhesive tape is partly covered with a piece of oiled silk about one inch square. Gauze or linen, two or three layers thick, is cut about one-half inch square. This gauze is moistened with the suspected material. The gauze square is placed in contact with the skin and covered by the oiled silk and adhesive tape. Spain has used ordinary blotting paper instead of gauze and found it satisfactory. If the tests are few they may be applied to the arm. Frequently, however, there are many suspects so that it is necessary to apply the tests to the back. Ordinarily the patches are left in contact with the skin twenty-four hours. If, however, a severe reaction results, the patch should be removed. Spain, in his work of poison ivy, found that contact for two to four hours was sufficient.

It is now a well-established opinion that many cases of dermatitis or eczema of an erythematous, papular and vesicular type are truly allergic phenomena. Much of the experimental work has been done with plants such as primrose. Bloch, for instance, has succeeded in sensitizing himself to primrose. There are so many individuals who are sensitive to plants that experiments can be repeated sufficiently often to be convincing.

It is well known that in certain cases of urticaria, the patient can be shown to be sensitive to various substances. This has been demonstrated by scratch and intradermal tests. In eczema, how-

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* Read before the Dermatology and Syphilology Section of the California Medical Association at the sixtieth annual session, San Francisco, April 27-30, 1931.

ever, the allergic phenomena often differs. Thus a patient's skin may react to simple prolonged contact, but not to the scratch test. Were the scratch test only done on such a patient, he would remain in the group of eczemas of unknown cause. It can now be definitely said that, in investigating the cause of eczema, the patch test is one of the essential methods, and in such cases is superior to other functional skin tests.

CLINICAL APPRAISAL

It is easy for this test to become cumbersome. One must not forget that he is practicing clinical medicine rather than mechanistic medicine. If every case of eczema were subjected to testing with all possible contacts the results would be confusing and discouraging. In the average case a careful history and close study of the lesions will point to probable substances involved. By a proper clinical appraisal, the number of tests to be done is lessened and the entire procedure simplified. This is well illustrated by a case report recently published by Sulzberger and Weinberg. The patient, suffering with an extensive dermatitis sufficiently severe to markedly affect the general health, had been treated for months by diet, glandular substances, colonic irrigations, blood injections, Alpine light, et cetera. A careful history indicated an external irritant as the probable cause. Questioning reduced the probabilities to eight. One of these, an insect powder, was definitely shown, by means of the patch test, to be the etiologic factor. Removal of the powder from the patient's environment was followed by a permanent disappearance of the eruption.

The phenomena of eczema are explained as allergic reactions. Certain cells have become allergic due to previous contact with a specific substance. This is not necessarily protein in nature. As a result of this contact, fixed cell antibodies are supposed to develop. Another contact with the specific substance then results in a reaction. This development of actual sensitization has been accomplished many times in man and animals.

Of particular value are the experiments of Bloch in which he sensitized himself and others to primrose. These experiments explain the phenomena of acute dermatitis venenata. The problem of chronic eczema presents many difficulties. Perhaps, in order to provoke a dermatitis, prolonged contact with the antigen is necessary, especially if the antigen be dilute. Some evidence in favor of this possibility may be adduced from the fact that Bloch could sensitize a man to primrose much more rapidly by using a very concentrated extract.

There are certain times when the reactivity of the skin is exaggerated. At such times one may obtain numerous positive reactions from substances that have no relation to the dermatitis. These cases must be retested. The increased reactivity of the skin may be lessened by a brief period of rest in bed and by the promotion of elimination.

On the other hand, there are refractory phases during which time a patient will not react to substances to which he is actually extremely sensitive. Therefore suggestive reactions should always be repeated. Negative tests should also be repeated when a carefully taken history is indicative.

Attempts have been made to determine the degree of sensitization of the individual patient. The tests are made with the known allergen in different dilutions. This has been of particular value in poison oak and poison ivy dermatitis. The allergen is applied in different dilutions, as described above. The weakest dilution giving a reaction serves as an indication of the dose to be used in attempts at desensitization. The next weaker dilution is the first one used. In this manner the danger of severe reactions is minimized.

The older idea of an internal or metabolic cause for eczema is being attacked. Numerous attempts to explain the condition by means of blood chemistry determinations, endocrine studies, et cetera, have so far given few definite findings. Recently attention has been directed toward the calcium and potassium ratio in the blood, but nothing of a positive nature has been shown.

There certainly is some change in certain cells that allows them to react in a characteristic manner; what it is no one as yet knows. It is known, however, that there is a specific reaction with a specific antigen. Practically it is often possible to identify the antigen. Its elimination from the patient's environment is then followed by a disappearance of the lesions. This conception applies to all allergic diseases.

The patch test applies especially well to patients with acute and subacute dermatitis venenata. In the study of chronic eczema it has been unsatisfactory. This is perhaps explained by Bloch's experiments. Prolonged contact is often necessary for sensitization. Perhaps prolonged contact is sometimes necessary to produce a positive skin reaction. This idea awaits experimentation and development. It may further the application of the patch test to a larger group of clinical conditions.

INTERPRETATION OF THE PATCH TEST

The interpretation of the test is important and there are several factors that must be kept in mind. The question arises as to what comprises a positive reaction. To be considered positive there must develop an area of dermatitis. There should be itching, erythema, and vesiculation as in ordinary clinical dermatitis venenata. However, there are certain reservations that must always be held in mind in interpreting the results of the tests. These have been well summarized by Sulzberger and Wise. While a dermatitis at the site of the test means hypersensitiveness, certain conditions must be met before one is justified in concluding that the specific substance used is responsible for the eruption. Care must be taken to identify a positive reaction from a dermatitis due to the adhesive tape. The two lesions are separated by a line of normal skin which has been protected by the oiled silk. Even though a test be positive, it is without meaning unless the history indicates that the patient comes in contact with the substance.

The patch must also correspond to the eruption being investigated. The test must, therefore, result in a dermatitis in order to be positive.

Prevention of contact must be followed by disappearance of the dermatitis. It must be recalled that sensitization is frequently polyvalent. This merely means that contact with all substances to which the patient is sensitive must be avoided.

REPORT OF CASES

The following brief case reports will illustrate some of the clinical problems with which one comes in contact.

CASE 1.—Miss A. M. Age, twenty-six years. Complained of eruption of face and neck; duration, off and on, for one month. Past history negative except for several attacks of "poison oak." Examination showed marked erythematous, scaling dermatitis of face and neck. No vesiculation. Lids markedly swollen. Skin and mucous membrane otherwise negative. Patch test with contacts. Rouge was positive, with marked vesiculation. Discontinuance of the rouge was followed by prompt relief. There have been no further attacks for six months.

CASE 2.—A. N. Painter. Age, fifty-four years. Complained of eczema of hands and face. Duration, two months. He has been a painter for thirty-five years. Examination showed a scaly and vesicular dermatitis of face, neck, and hands. There was a definite line of demarcation between involved and normal skin at root of neck and wrists. He had been using a turpentine substitute composed of petroleum distillate and pine oil. Patch tests with these two substances gave marked bullous eruptions. Distillate is a primary irritant. The pine oil in the dilutions which were used did not provoke an eruption on normal skins.

Avoidance of contact with the turpentine substitute was followed by prompt relief.

SUMMARY

In conclusion, we may say that the patch test gives us a simple method of segregating certain cases of eczema and establishing the identity of the offending substance or substances. We will briefly summarize the conditions that must be fulfilled:

1. There must be history of contact.
2. The result must be some variety of dermatitis.
3. Removal of the substances must cure the patient.

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DISCUSSION

FRED FIRESTONE, M. D. (Medico-Dental Building, San Francisco).—As one interested in allergic diseases, it affords me great pleasure to discuss Doctor Graves' interesting paper, for the coincidence reveals the close relationship of allergy to the complicating dermatoses.

The generalized acceptance of the patch test in the armamentarium of the determatologist, as expressed in Doctor Graves' paper, is very timely. The simplicity of the test warrants its use. The close adherence to the three postulates, as emphasized by the author, is imperative to proper interpretation. History of contact cannot be overemphasized. There is merely one warning to be added in the contact history, for it has been shown by Dr. Henry W. Straus that infants may be artificially sensitized to poison ivy, provided there was a previous contact. Further, it has been shown in pollen dermatitis cases that often it is necessary to have a prolonged contact with the pollen oil, and that the actual lesion of the dermatitis may not appear for a period of several weeks.

The second postulate that the resultant lesion of the patch test must simulate the original dermatitis goes without saying; and third, that the removal of the offending excitant with a clearing of the lesion, and the recurrence with contact clinches the diagnosis.

The greatest field of usefulness of the patch test comes in the group designated as dermatitis venenata, as specifically demonstrated by poison ivy, poison oak, sumac, and primrose. The occupational dermatitis cases due to irritants handled offers a great field, as emphasized by varnish, turpentine, boxwood, cedar wood, dyes used in furs and woolens, anilin dyes and paints. Personally I have treated a dermatitis due to henna and inecto used by one of the operators in a hair-dyeing parlor. Sulzberger and Kerr recently demonstrated trichophytin hypersensitiveness of the urticarial type, with circulatory antibodies and passive transference, and advocate the use of Hoechst trichophytin paste * as part of the routine investigations of urticarias of unknown etiology.

Furthermore, the great variability of skin hypersensitiveness in different individuals to the same excitant and the degree of reactions at varying intervals cannot be stressed too strongly, so that often retesting is absolutely necessary to bring proper results.

Too much emphasis cannot be brought to bear on the significance of using varying dilutions of the known allergen as a means of determining the degree of sensitization, as shown by Spain, and thus affording an indication of the dose to be used in attempting desensitization.

I concur in my opinion with Ramirez and Eller, who state that the patch-test method of testing is superior to other methods in determining sensitization to contact excitants, and particularly those of nonprotein nature.

NORMAN N. EPSTEIN, M. D. (Four Fifty Sutter Building, San Francisco).—The use of the patch test in an attempt to determine a specific etiologic cause for a dermatitis venenata is certain to come into more general use because of its simplicity and ease with which it can be performed. While it cannot be hoped that it will solve the question of eczema or dermatitis, still it will segregate a few more cases from that large group which is now classified as eczema.

Doctor Graves has spent a great deal of time and study in applying the patch test. His paper is timely and should stimulate many of us to a more frequent use of the method.

Of particular interest is the possible application of the patch test to certain industrial cases. We have all had to deal with the problem of the painter who, after following his trade for many years, develops a dermatitis which recurs repeatedly when he comes in contact with materials which formerly caused no effect upon his skin. From a clinical standpoint this patient has become sensitized to these irritants, due to prolonged and repeated contact. If it can be shown by the patch test that the irritant is a specific one and the removal of this will allow the patient to continue his work, a great good will have been accomplished.

SAMUEL AYRES, JR., M. D. (2007 Wilshire Boulevard, Los Angeles).—We have employed the patch test for several years in determining the etiology in cases of contact dermatitis, and I can endorse all that has been said by the author and the previous discussers. In the past we have all been too prone to jump at conclusions as to cause and effect upon such unreliable evidence as clinical appearance and history. Since the use of the patch test we have been afforded some very interesting surprises, and many substances hitherto unreported as causes of dermatitis venenata have been incriminated by this technique. Like Doctor Firestone, we have also encountered a case of dermatitis venenata in a beauty-shop operator who was found by patch test to be strongly sensitive to red and bronze henna and also to inecto. Another incident illustrating the value of these tests was in the case of two dentists seen within the same week, both complaining of an erythemato-squamous and fissured

* Imported by Metz & Company, New York City.

eruption of the hands and fingers. The natural impulse was to attribute the eruption to novocain. A patch test of this substance on one dentist was positive, thus confirming the clinical diagnosis, while the other failed to react. A careful microscopic examination of scales from the hand of the second dentist revealed large numbers of fungi, thus substantiating the accuracy of the negative patch test to novocain. The appearance of the eruption in both cases was strikingly similar, and I feel that a differentiation on clinical grounds alone would have been impossible.

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DOCTOR GRAVES (Closing).—The discussers have emphasized the important points, so that little more need be said. The application of the patch test to dermatitis venenata is apparent. It is to be hoped that refinements of the test will enlarge its scope of usefulness.

The use of this test by means of prolonged contact may demonstrate a reaction in some cases of "chronic eczema." These may then be classified as chronic dermatitis venenata. In this manner the applicability of the term "eczema" can be further restricted.

CALCULOUS ANURIA*

REPORT OF CASE

By EDGAR C. LEE, M. D.
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DISCUSSION *by Nathan G. Hale, M. D., Sacramento; A. J. Scholl, M. D., Los Angeles; Franklin Farman, M. D., Los Angeles.*

ONE of the most serious complications arising in renal lithiasis is anuria. The conditions in which complete cessation of urinary secretion occurs have long been recognized, but it may be permissible to briefly review them.

First: Both kidneys may simultaneously become obstructed by stone.

Second: The obstruction may affect a single kidney, the opposite kidney being congenitally absent or renal function having been previously destroyed by disease.

Third: A fused ureter draining both kidneys may become blocked.

Fourth: A reflex anuria may occur, the obstruction to one kidney resulting in a reflex inhibition of kidney function on the opposite side.

Some of the salient points in the clinical course of calculous anuria were well shown in a case recently observed by the writer.

REPORT OF CASE

The patient was a man forty-five years of age, who was admitted to the hospital on the 28th of June, 1929. He was a well-developed man who worked as a laborer; his weight was 170 pounds, and he had always been in good health. There was no history of any previous symptoms referable to the urinary tract. The onset of his illness began two days before he was admitted to the hospital and was characterized by diffuse abdominal pain radiating toward the right flank. This was accompanied by nausea and vomiting; the pain subsided after a few hours, but the vomiting was persistent.

Examination at the hospital showed abdominal distention with marked rigidity of the abdominal muscles, no area of pronounced tenderness was made out either in the abdomen or in the region of either kidney, and there were no other physical findings.

The pulse rate was 72; temperature, 97.6; blood examination showed 4,120,000 red cells and 9900 leukocytes with a differential count of 85 per cent polymorphonuclear cells. The hemoglobin index was 70 per cent; the blood pressure was found to be 160 over 110.

On this day he voided eight ounces of urine. The specimen was brownish in color and showed a faint trace of albumen and no sugar. The centrifuged specimen showed many red blood corpuscles and a moderate number of epithelial cells and leukocytes.

Roentgenologic examination of the urinary tract revealed a shadow of stone density about five to seven millimeters in size in the region of the right kidney. On the left side, at the level of the first lumbar transverse process, a faintly outlined shadow was shown, the character of which was not determined; it was not of stone density and suggested a partially calcified mesenteric gland.

An enema afforded the patient considerable relief from his abdominal distention and his general condition appeared good, nausea and vomiting being at this time the outstanding symptoms.

The blood chemistry which was done on the following day showed 59 milligrams of urea nitrogen per 100 cubic centimeters of blood with a 2.5 milligram of creatinin.

A cystoscopy on this day showed 40 cubic centimeters of dark-colored urine in the bladder. The bladder mucosa was normal throughout, the right ureteral opening appeared somewhat swollen, and the left ureteral opening was not visualized. A No. 6 catheter passed to the level of the right kidney pelvis without meeting any obstruction, but it was not possible to establish any urinary drainage through the catheter. Ten cubic centimeters of indigo carmin were injected intravenously, but there was no return of the dye from the catheter in the right ureter nor was any dye observed being brought into the bladder from the left side. On the afternoon of this day the patient voided twelve ounces of urine, the character of which was similar to the specimens examined previously.

Fluids were given freely, the patient being able to retain water by mouth; and the rectal drip was well tolerated. The abdominal muscles were now comparatively relaxed, and nausea, though recurring at intervals, was not enough to prevent the patient from taking water by mouth.

During his third day in the hospital he voided three ounces of dark-colored urine. His general condition remained good and he was apparently relieved of his previous abdominal distress.

There was no further renal secretion during the next three days in spite of which no symptoms suggestive of uremia developed. Glucose solution was given intravenously; the patient's skin was moist and there was no apparent change in his general condition. On this day the blood chemistry showed a rise of urea-nitrogen to 140 milligrams per 100 cubic centimeters of blood; the creatinin curve reached 6.8; the patient, who had been advised previously regarding surgical treatment, then consented to an operation.

Under ethylene-oxygen anesthesia the right kidney was exposed and found to be greatly engorged with the capsule very tense. A nephrotomy was done by an incision over the convex border of the kidney and the pelvis was explored for the presence of a calculus. As no stone could be palpated, no prolonged search was made and a soft drainage tube was placed in the pelvis through the kidney incision and the wound was closed in the ordinary manner. Before the operation was completed there was free drainage of blood-stained fluid through the tube.

The patient was returned to his room from the surgery at 2:30 p. m. and 1000 cubic centimeters of normal saline solution was given intravenously. By

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* Read before the Urology Section of the California Medical Association at the sixtieth annual session, San Francisco, April 27-30, 1931.