Each of the four canulas (Fl, 2, 3, and 4) is then tied into the carotid artery of a dog. Pressure is obtained within the various tubes from the pressure bottle (P) by opening the cocks, (Tl, 2, 3, and 4) (T2 invisible). It will be noted from Figure 1 that each connecting tube (Hl, 2, 3, and 4) terminates in a three-way stopcock which enables the operator to connect it with either a manometer which writes on the smoked drum, or with a "dummy" manometer.

To assay two samples of ergot it is merely necessary to use two dogs on one end of the kymograph for one sample and two on the other end for the other sample. The three-way stopcocks are arranged in such a manner that one dog on each end records its pulsations upon the revolving drum, while the other pulsates against a "dummy" manometer. Inject the proper dose of fluid extract of ergot into the dog which is recording its blood pressure on the right-hand side of the kymograph; allow the drum to revolve five, ten and fifteen minutes after the injection. Then by merely reversing the stopcocks (D3 and 4) the dogs can be interchanged, or in other words, the dog which was recording its blood pressure on the smoked drum will pulsate against the mercury in the "dummy" manometer, and the one which was previously pulsating against the "dummy" will record its normal blood pressure upon the smoked drum. After taking a normal tracing of several inches in length, stop the drum; then check the former results by injecting this dog with the same preparation given to dog No. 1; again, take tracing five, ten and fifteen minutes after the injection. Repeat operation by injecting, in a similar manner, the other sample into the dogs on the left-hand side of the drum. This will consume about one hour and fifteen minutes. It is then necessary to wait only about fifteen minutes or until the one and a half hours have elapsed since the first injection was given when the entire procedure can be repeated. This is continued until each dog has received three or four injections. The charts are then measured and the average rise of pressure produced by each preparation is taken as its figure of potency.

To assay one sample of ergot in duplicate and one sample of adrenal extract it is necessary to employ only three animals, two on the one end for the ergot and one on the other end for the adrenal extract.

PHYSIOLOGY LABORATORY OF H. K. MULFORD COMPANY, July, 28, 1913.

BETHABARA.

OTTO RAUBENHEIMER, PH. G., BROOKLYN, N. Y.

A few years ago at a meeting of a State Pharmaceutical Association, a highly scientific paper was followed by a rather ordinary one on "Fishing Tackle." What a contrast! From the sublime to the ridiculous! Perhaps I will be also criticized by reading before the Scientific Section of our great A. Ph. A., a paper on "Bethabara," which is the name of the wood used in the manufacture of fishing rods.

The vegetable kingdom abounds in dye stuffs which have been made use of from the oldest times. The ancients well knew how to prepare, how to extract, and how to treat the raw material in order to bring out the most beautiful colors. Dyeing belongs to the many arts which the Egyptians, Lydians, Phœnicians, and the Jews have greatly developed. They knew how to fix certain dyes, especially on cloth, by means of mordants. Color reactions, indicators and test papers have also been observed and utilized in ancient times. As an illustration of this kind I might mention that paper saturated with extract of nutgall was then used to detect the admixture of the cheap iron vitriol with the more expensive blue vitriol. Dominique Duclos (1623-1684), the physician-chemist of Paris, introduced reagents of nutgall, iron-vitriol, litmus, decoction of lillies and of Brazil-wood. Michel Eugène Chevreul (1786-1889), the Nestor of the French chemists, as director of the world renowned Gobelins tapestry works in Paris, greatly improved the chemistry of dyeing, as well as that of dye stuffs. In 1811 he prepared hæmatoxylin from logwood and brazilin from Brazil or red-wood. Both of these chemicals have since then come into use as indicators, especially in the volumetric analysis of alkaloidal solutions.

A few weeks ago Dr. Binford Throne, a native of Nashville, and now a well-known dermatologist of Brooklyn, made himself a fishing rod from Bethabara wood. This wood is highly valued on account of being exceedingly tough, hard and close grained. Dr. Throne discovered that after working with this wood and washing his hands with soap and water a beautiful red color was developed, evidently from the alkali in the soap. He brought me some of the shavings and asked me to further investigate the coloring matter, which is the excuse for my present paper.

In order to be absolutely sure of the proper botanical origin of this wood, the author sent samples to Dr. C. D. Mell, in charge of Wood Structure Investigations, Forest Service, United States Department of Agriculture, Washington, who was kind enough to examine some and pronounce it a true sample of Bethabara, which compares exactly with the sample in the Forest Service wood collection. Dr. Mell was also good enough to give me the following information:

"Bethabara is a name which was copyrighted by William Shipley, of Philadelphia, and applied to a wood which he imported into this country from British Guiana, South America. The tree producing this wood is commonly known in British Guiana and also in the English market as wicaba, washiba, or bow-wood, and its generic name is *Tecoma*. I have been unable to determine which one of the many species of *Tecoma* yields the wood known as 'bethabara,' but it is probable that it is produced by several species of this group. Even the wood of an unrelated tree known as tonquin or tonga (*Dipterix odorata*), also of British Guiana, has been sold in the American markets as 'bethabara' for making fishing rods. The beans of the latter have a medicinal value, but so far as is now known the wood of these two trees does not yield commercial dye. The pores or vessels of these woods are filled with yellowish-green tyloses, which may perhaps by proper treatment yield a dye.

"The true bethabara (*Tecoma* sp.) grows to a large size, but is a rare tree and little known. The wood is of an olive-green color, is exceedingly tough, hard, and close grained, and is the best known wood for bows. The average height of the tree is about 120 feet and it can be had to square thirty inches free of sap."

Dr. Mell was also good enough to supply me with authentic samples of *Tecoma* and of *Dipterix odorata,* which are herewith submitted as specimens.

Extracts of Bethabara.—Thinking that Bethabara might be similar to Brazil-wood, I first employed the U. S. P. Process for making Brazil-wood Test Solution, but I soon discovered that water does *not* extract the desired indicator. The shavings of Bethabara wood were extracted with the following different solvents, making a uniform 5 percent solution:

1. Cold maceration with water.	4. 25% Alcohol.
2. Infusion.	5. 50% Alcohol.
3. Decoction.	6. 95% Alcohol.

The cold aqueous extract has a yellowish color, while that prepared by heat has a purplish or reddish-brown color, according to the heat employed.

The alcoholic tinctures increase in color to a reddish-brown with the increase of alcohol.

Experiments With the Extracts as Indictors. Numerous experiments were made and it was soon discovered that the aqueous extracts had very little or no value as an indicator. The tincture prepared with 25 or 50 percent alcohol were somewhat better, but by no means ideal. However, the tincture prepared with 95 percent alcohol proved an indicator *par excellence.* It is the equal of phenolphthalein test solution and is much sharper than litmus-paper.

The Indicator-Tecomin (?). Several attempts have been made by the author to isolate this indicator. These experiments, owing to the limited supply of the wood, had to be somewhat restricted.

An alcoholic tincture was precipitated with water and then set aside. A yellowish substance precipitated, the supernatant liquid retaining its reddish-brown color. By repeated washings with water and subsequent drying, a yellow powder was obtained as shown by the sample. This powder is insoluble in water, but is freely soluble in alcohol.

Another method pursued consisted in first extracting the Bethabara shavings with boiling water repeatedly, until the infusion is almost without color. Then the wood is macerated with water containing one percent of ammonia water, which forms a blood-red solution, which is concentrated by evapôration, by which process the excess of ammonia is also driven off. The solution is then carefully neutralized with diluted sulphuric acid, which combines with the ammonia and liberates the yellow substance. This floats on top and can be obtained by filtration, washing and drying.

According to our present system of nomenclature the name "Tecomin" might be suitable for this indicator, being derived from species of the *Tecoma* wood. The author is in hopes that further experiments by himself and others will throw more light on this subject.

Conclusions. Bethabara contains a sensitive indicator which turns pink with alkalies and yellowish with acids. This indicator is especially sensitive to ammonia.

Pure alcohol is its best solvent.

This principle which is a yellow powder, can be obtained by precipitating the alcoholic tincture with water, washing the precipitate with water and then drying.