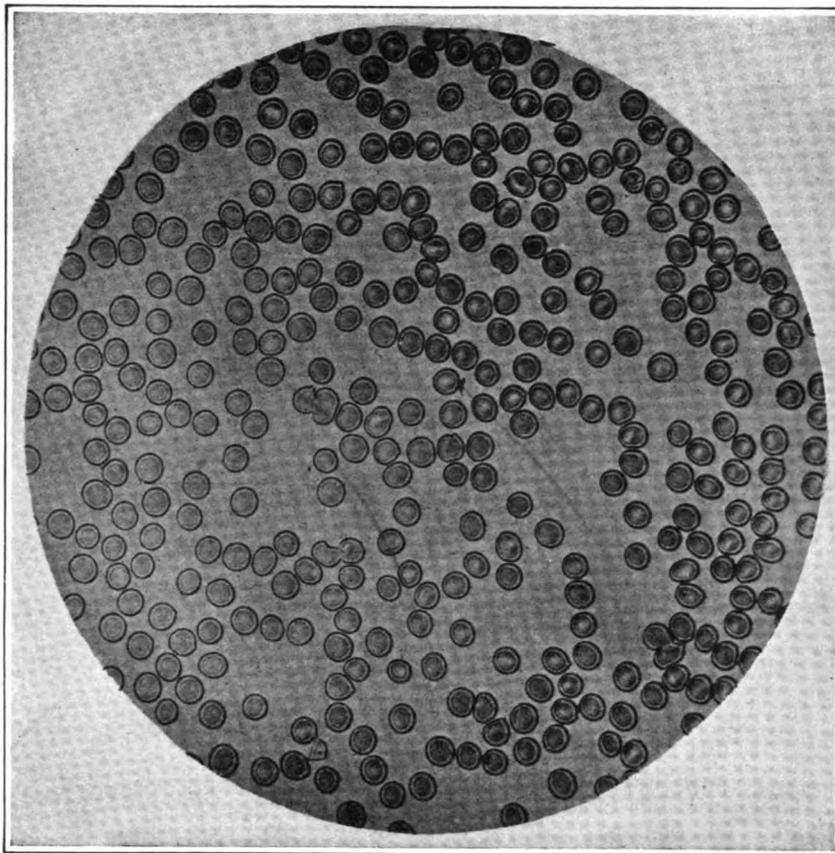


Photographing Blood Stains

MODERN criminology involves a very close study of bloodstains; and the expert to whom the court assigns this more or less gruesome job has not an easy task. In the first place, it often happens that there is not much blood left on a weapon. If it be a dagger or other sharp instrument much of the blood may have been wiped off on the edges of the wound or on the clothing of the victim. In many cases the stain is so faint and indistinct that it is very difficult to get the proper chemical reaction in the process which is usually employed in the close examination of such clues. This new apparatus, of which we show two views, obviates the necessity for the crystallization of the tiny blood globules. The fainter the stains are the better; for those very stains which are the faintest, because of their widely separated globules, are the most desirable for research work. The camera is the invention of Dr. Florence, a professor at the School of Medicine at Lyons; and it is manufactured by Nachet, of Paris. It merely attempts to record the photograph, or photomicrograph, of the stain, without changing it in any way. And such a photograph, of the stain itself, left untouched so that it may be photographed again if necessary, is a far more convincing proof to present to the court than are a few tiny crystals, for example, which are only the products of chemical treatment. Another advantage of this microscopic examination is to show, by the form and size of the globules, whether it is the blood of a human or an animal. One of our illustrations is a photomicrograph showing the globules in a drop of human blood, greatly magnified.

This photomicrograph apparatus of Dr. Florence is comparatively simple in construction. It is made up of three parts: the microscope itself, an incandescent gas lamp, and a camera. The whole apparatus stands on a wooden base, from which rise two metal columns. Each of these columns consists of two tubes, one sliding within the other; and they may be raised or lowered by loosening the tension of the screws. On one of the columns is swung the camera, a black box for holding plates 9 by 12 inches, provided with a bellows which may also be raised or lowered. This camera may be pushed to one side while the object is being studied under the microscope, and then swung into position and fitted over the microscope when the observer is ready to make his photographic record. Between the two columns on the wooden base stands a powerful microscope. The weapon to be examined is placed on a flat platform directly beneath the magnifying lens. To one side is an incandescent gas lamp, fastened to a movable arm, so that it can be placed in the most favorable position. When placed on the base, in front of the microscope, its rays cross the horizontal tube of the apparatus, and by a system of prisms inside are thrown directly on the object. After a close study of the object, the camera is swung into position, and both the box and bellows are raised or lowered to any distance from the object so that it may be magnified and photographed at the desired size.

By this method Dr. Florence and other scientists have photographed bloodstains on colored materials. Under such circumstances, the stains are often scarcely visible. The material is treated with an application of a liquid which discolors the fabric itself, but brightens the color of the blood. When viewed under the microscope, even the tiniest trace of blood is sometimes



The normal appearance of human blood under the microscope

sufficient to be a very important clue in establishing the truth about a crime.—By C. M. Lewis.

Magnetized Scale Weights

RECENTLY erratic and unsatisfactory scale weights designed for use on analytical scales in research laboratories have been submitted to Doctor Pinkowsky of the Federal Bureau of Standards for examination and correction. The scales on which these weights were used were useless so far as accurate and authentic weighing was concerned, and the scientists using these scales were exercised and anxious to run to earth the cause of error. Doctor Pinkowsky found out that the inefficiency and inaccuracy of the scales were due to the delicate weights used which were made of magnetic material. In this connection he wishes to warn all scientists and technical experts who have to purchase or use analytic scales and minutely small weights of this description to make certain that such weights are made of non-magnetic material.

The satisfactory weights for use on analytical scales which aggregate one-half a gram or less in weight are made of platinum or gold. Such weights are not subject to magnetization. On the other hand, delicate weights of this type made of steel, iron, nickel, nickel alloys or other magnetic materials are liable to be so magnetic as to be practically useless for accurate employment in scientific and research laboratories where foreign factors which exert erroneous influences are undesirable. Once delicate weights of this sort are magnetized, it is practically impossible to demagnetize them so that subsequently they may be used commercially. Doctor Pinkowsky advises that all scientists or technicians who purpose to purchase scale weights for use on delicate laboratory scales should test out the magnetic properties of these weights before making the purchase in order to insure against buying weights made of magnetic materials which would be worthless for work where the slightest error would be of important concern in governing the success of the results.

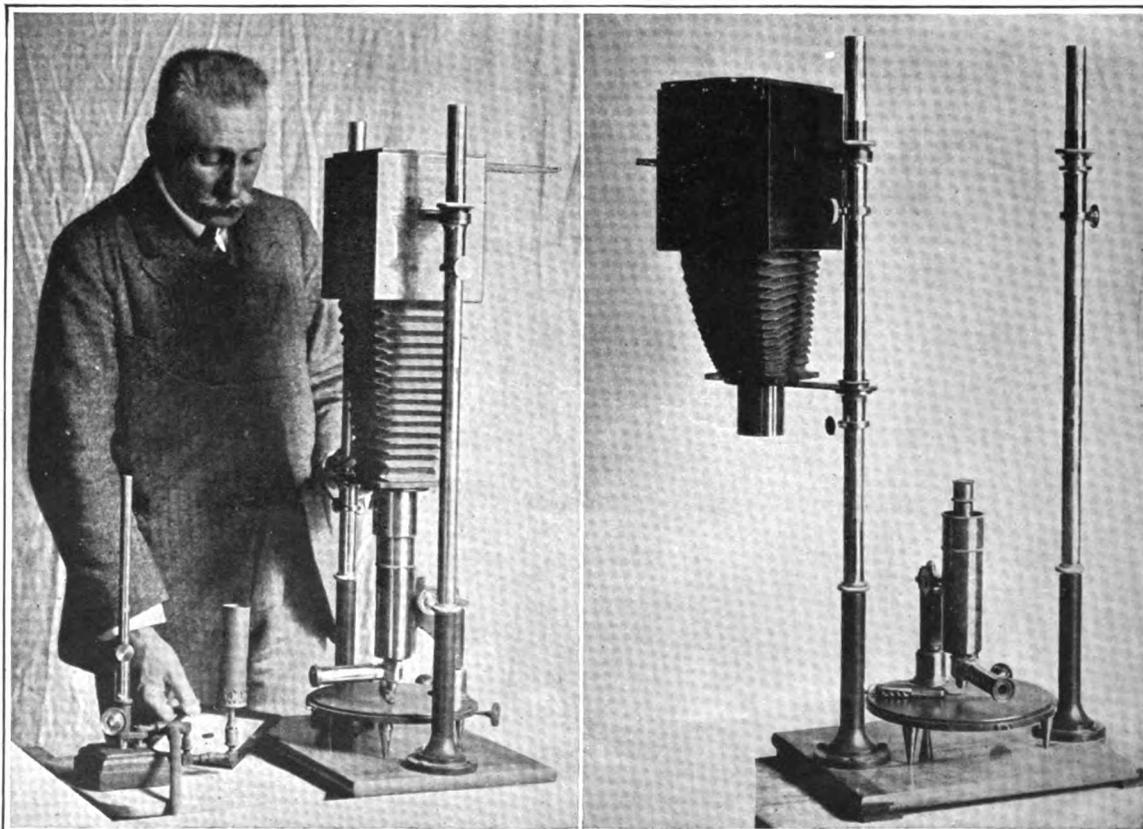
Cocoa and Cacao

THERE is still considerable confusion in the minds of a good many general readers in the north as to whether fruit cocoa and the breakfast cocoa are products of the same tree. In the German, Spanish and French languages the correct spelling of the breakfast beverage, *cacao*, has been preserved as it should have been in the English language. This confusion arose in England and America, because the a's in the correct name *cacao* have been changed to o's and the final o changed to an a.

Cocoanuts are produced by the cocoanut palm, or *Cocos nucifera*, growing throughout the tropical parts of the world. It has no branches, properly so called, but the leaves 12 to 14 feet form a kind of crown or fan-like summit to the tree, beneath which grows a cluster of the fruit or cocoanuts, which are collected and shipped to northern markets, where they are called cocoanuts.

The tree has very many uses. The roots are chewed; gutters and posts are made of the trunks; the young buds are prepared and eaten in the same way as cabbage; the leaves are manufactured into baskets, matings and many other articles. The midribs of the leaves form oars, and the bruised ends may be used in place of brushes; the juice of the stem yields palm wine, while the sap produces a sugar. If this sugar is mixed with lime it forms a powerful cement. The white meaty part inside the shell of the cocoanut forms a wholesome food and the milk a cooling drink. The coir or fibrous covering of the hard shell is used for cordage; the shell is used as a drinking cup, and the white meat inside yields the well-known cocoanut oil of commerce. All these uses and many others are attributed to the cocoanut palm, but it does not give us the breakfast cocoa.

It is the *Theobroma cacao* that yields the cocoa or cacao, as we shall call it. The tree is a native of South America, but it has been planted also very extensively in all parts of the tropics. The Mexicans call it chocolate, which is one of the names we use. The cacao tree is an evergreen and bears fruit and flowers all the year round, but the usual times for gathering the fruit are June and December. The seeds in the fruit possess the properties which we recognize in cocoa and chocolate as a valuable article of food. The amount of these seeds imported annually now exceeds 150,000,000 pounds.



Left: Making a photomicrograph of a drop of blood from a knife-blade. Right: The Florence apparatus for work of this sort
Photomicrographic examination of blood stains, an achievement of modern criminology