holy name under penalty of being plunged into utter darkness and in an abode of filth being turned into sheer dung beetles! Knowing, however, that a complete cessation of work must mean utter destruction, the crafty Kye-Kye, after another interview with the Ant-Mother, said that she had given him permission to represent the people, and so with a few others he formed the band of Holy Ants or Fat Bellies, which were fed and cared for by their less sacred brethren. This example was followed by the other ant-nations of the Aruwimi glade, each giving their giant-ant a particular name and laboring under the delusion that theirs was the only true Ant-Mother. As with man, so with these ants was God created in their own image. The adoption of religion, the supposed panacea of all ills, led to various holy wars which resulted in the increased power of the monarchy and their warriors. These warrior-ants desired the same life of ease as their holy brethren and formed a sect known as the Robber or Lord Ants, or more vulgarly as Big Heads. They were responsible for the despicable institution of slavery to ensure their life of luxury and ease.

Professor Ferenczy goes on to relate how the daughter of King Tye-Kye, the beautiful Tye-Nye, eloped with an ant of another nation (Hye-Hye of Hye) and of the war which resulted between the two nations. Other interesting chapters in his book (which space does not permit us to review in detail) are those dealing with the Holy Fat-Belly, Kye-Lye, who learned to write with his feet and was regarded as insane by his brothers, of the Aruwimi ants' love for the intoxicating juice of the Sacred Berry, of their marvelous systems of agriculture and weaving, of their living honey-pots, and of the betrayal of the lies of their ancestors by the Holy Kye-Pszye and the Big Head Pye-Kszye. His story reaches its climax with an account of the great Ant-World War and the eventual restoration of the laws of Mye-Mye, the great and universal truth of which reads, "The only clear title to life is Labor;" and so the ants returned to their primitive habits. Will man follow them?

Dr. Thümmel believes that the ants are at least three times as wise as us "stupid, God-forsaken, two-legged protégés of Prometheus," but his work itself belies this statement. In closing the covers of a delightful book we are compelled to agree, in two-legged arrogance, with Mr. Julian Huxley:

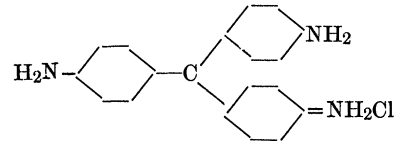
> The Ant herself can not philosophize—
> While Man does that, ...
> And flies, and talks and is extremely wise.

CEDRIC DOVER

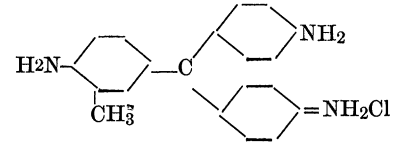
LONDON

A REPORT ON BASIC FUCHSIN

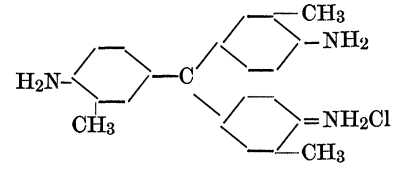
WHEN the Commission on Standardization of Biological Stains undertook the investigation of basic fuchsin, looking toward its certification, certain problems were discovered that had to be solved before definite specifications for this stain could be drawn up. There are three different compounds present to a different extent in grades of basic fuchsin. These three compounds differ from each other in the number of methyl groups they contain. The simplest of these is pararosanilin, which has the formula:



This same compound with one methyl group introduced becomes rosanilin:



With three methyl groups it becomes new fuchsin:



There are three recognized textile dyes composed of these three compounds. The first of these (which is given the number 676 in the Colour Index) is essentially pararosanilin. It is sometimes called basic fuchsin, but should probably be called basic rubin. The second (Colour Index No. 677) is a mixture of rosanilin and pararosanilin in about equal parts; it is the basic fuchsin of commerce. The third is trimethyl fuchsin, and has the Colour Index No. 678; it is known in the trade as new fuchsin. It was discovered that different stain manufacturers are supplying biologists with different compounds in this group under the name of basic fuchsin.

There are two chief purposes for which basic fuchsin is used, first for bacteriological staining (especially for the tubercle organism) and secondly for use in the Endo medium for the detection of the typhoid organism. Some manufacturers put out a special product for each of these two purposes. Others claim that theirs will do for both purposes. In the absence of authoritative information on this subject an investigation seemed to be called for.

In the course of this investigation eleven different

samples of basic fuchsin were submitted to examination. Five of them proved to be fairly pure pararosanilin, five of them new fuchsin, and the eleventh sample apparently a rosanilin almost entirely free from pararosanilin and hence different from any of the ordinary fuchsins of commerce.

The results of the investigation showed quite plainly that, although pararosanilin is ordinarily satisfactory as a bacteriological stain and for other staining purposes, it is not usually satisfactory in the Endo medium. One sample was found which gave good results when used for the latter purpose, but just why it proved better than the others has not been learned. The best sample for all purposes, as judged by the five reports received from different investigators, was the sample of rosanilin without pararosanilin. Almost equally good, however, were some of the samples of new fuchsin. Accordingly the following specifications are now drawn up to apply to basic fuchsin:

(1) Basic fuchsin designed for staining and indicator purposes must be rosanilin or new fuchsin (Colour Index No. 678) or else a mixture of rosanilin and pararosanilin containing at least half of the former (that is corresponding to Colour Index No. 677).

(2) Fuchsin samples to be certified by the commission must be of such a strength that, when reduced by titanous chloride in an atmosphere of carbon dioxide, one gram of the dye will consume at least 46.5 cc normal titanous chloride solution. A sample of this strength will be between 76 and 85 per cent. total dye content, the exact dye content varying according to the relative amounts of the higher and the lower homologs present.

(3) The sample should prove satisfactory for staining the tubercle organism and should retain its color sufficiently when treated by the Ziehl method to be diagnostic when staining tubercular discharges. This must be determined by an investigator skilled in this particular technic.

(4) The sample must prove satisfactory for use in the Endo medium. In making this test the following technic should be used: A saturated alcoholic solution is diluted 10 to 30 times, the dilution to be such that no precipitation occurs when mixed with a sodium sulphite solution. Then add 0.5 cc of this dilute fuchsin solution to 10 cc of a 2.5 per cent. sodium sulphite solution. Add it to the other ingredients of Endo agar, sterilize and cool. It should then be colorless, but the color must be restored by the colon and dysentery organisms when inoculated upon it. The test must be made by one familiar with the technic in question.

(5) It must be understood that as basic fuchsin is used in other special forms of technic, new standards may be called for. The present specifications apply particularly to the above mentioned two uses; but samples fulfilling them are ordinarily satisfactory for all histological purposes.

At the present time permission to use the commission's label on batches of basic fuchsin submitted has been given to three companies. Some of the batches submitted are recommended as satisfactory for general staining purposes and for use in the Endo medium. Others have been approved for one or the other of these two purposes only. The three companies in question are the Empire Biochemical Company, the Hartman-Leddon Company, and the National Aniline and Chemical Company. The certified samples of fuchsin do not have to be bought from these three concerns directly, but can be obtained through dealers in biological supplies. It is recommended that any one desiring fuchsin of this quality order it from some dealer, specifying the basic fuchsin certified by the Commission for either one or both of the above-mentioned purposes, according to the needs of the particular purchaser.

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Chairman, Commission
on Standardization of Biological Stains
GENEVA, N. Y.

SPECIAL ARTICLES

SERIES IN THE SPECTRA OF ALUMINUM AND MAGNESIUM IN THE EXTREME ULTRA-VIOLET

PASCHEN (Ann. d. Phy., 71, p. 152, 1923) in his investigation of the spectrum of doubly ionized aluminum (Al. III) and Fowler (Series in Line Spectra, p. 120) in his study of ionized magnesium (Mg. II) have pointed out the type of series relations which exist in these substances, and have arranged many lines to conform to them. In a study of the spectra of both aluminum and magnesium in the extreme ultra-violet under various forms of excitation, I have recently observed certain lines which appear to be higher members of some of the series discovered by Paschen and by Fowler; Millikan has already identified the two strongest but the remainder seem to have escaped observation. The wave lengths and the series to which these lines belong are given in the following tables.

The lines in aluminum were obtained with the vacuum spark and also with a condenser discharge in an atmosphere of helium at about a millimeter pressure. The magnesium lines were most strongly excited by an arc of 40 volts and about ten amperes operated in a high vacuum by means of a trembler device.

The numerical values of the wave lengths should be correct to at least two tenths of a unit.