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BEING APPLIED TO THE DISEASE KNOWN
AS HAEMORRHAGIC MALARIAL FEVER

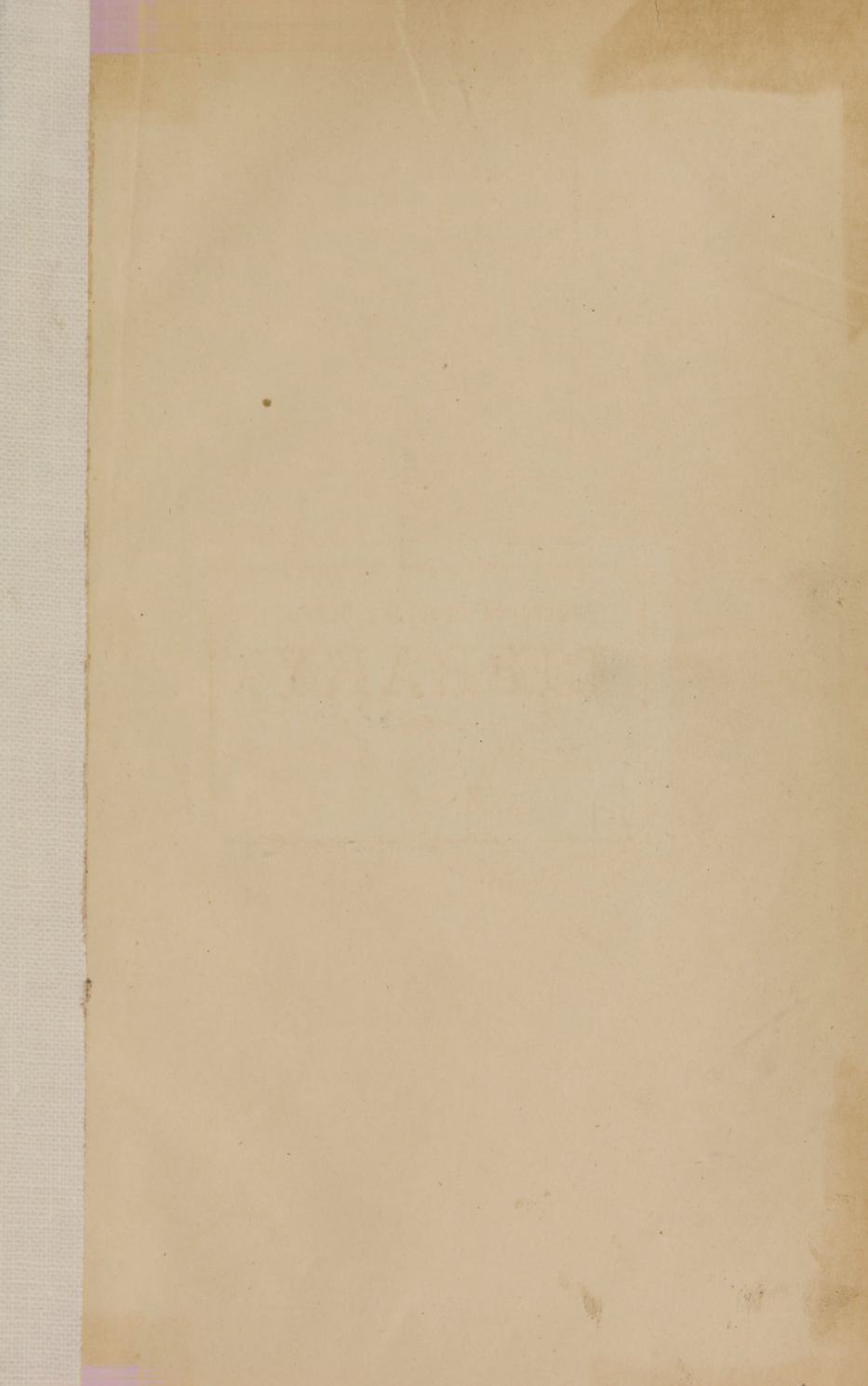
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OBJECTIONS

TO THE "SUNSHINE" THEORY OF THE
DISEASE KNOWN AS MALARIAL FEVER
MALARIAL FEVER

BY R. E. MICHELL, M.D.

OF WASHINGTON, D.C.

OBJECTIONS

THE TERM "PURPURÆMIA" BEING APPLIED TO THE
DISEASE KNOWN AS "HÆMORRHAGIC
MALARIAL FEVER."

BY R. F. MICHEL, M. D.,
OF MONTGOMERY, ALA.

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J. Payne Archer M.D.
Charleston

OBJECTIONS

TO THE TERM "PURPURÆMIA" BEING APPLIED TO THE DISEASE
KNOWN AS "HÆMORRHAGIC MALARIAL FEVER."

BY R. F. MICHEL, M. D., OF MONTGOMERY.

As an effort has been made to call the disease which I described at our last meeting as "*hæmorrhagic malarial fever*" "*purpuræmia*," I desire to enter my objections to this term, as applied to this malady, upon the following grounds:

First. That the name purpuræmia gives us no idea of the disease.

Second. That the presence of purpurine in the urine is by no means pathognomonic of hæmorrhagic malarial fever, and is frequently found as an ingredient of the urine in many diseases.

Third. That the presence of purpurine in the urine of patients laboring under hæmorrhagic malarial fever is exceedingly rare, and must be regarded by pathologists as the exception and not the rule, while blood has been recognized in the urine of this disease by all who have examined it carefully.

Fourth. That the substance purpurine is called by as many names as we have writers upon the subject; and that its true chemical character is almost, if not entirely, undetermined in science.

In the first place this disease is A FEVER, most frequently of an intermittent type, and occasionally remittent in its character, with regular intermissions, remissions and exacerbations recognized by all who have seen and described it. It is produced by a poison which we term MALARIA, and is controlled (if ever) by remedies which are regarded as almost specific in diseases produced by a similar cause. It is the only malarial affection with which I am acquainted that bleeds, or (to use more medical language) in which there is A HÆMORRHAGE from the kidneys.

Now, with such a picture before us, tell me what signification does purpuræmia cover?

The presence of purpurine in the urine cannot be regarded as pathognomonic of hæmorrhagic malarial fever, for we know that it

is recognized in many other affections, and in a pathological point of view, is dependent upon some irregularity in the elimination of carbon from the circulating fluid.

Now, although the liver is regarded as an important organ in the history of this physiological act, we must not lose sight of the fact that the lungs play an important part in this function, and if we observe purpuric urine in diseases of the liver we also find it an ingredient of the urine in lung affections. It is also not unfrequently observed in splenic diseases, and with your permission I will now proceed to give you a synoptical account of the diseases in which this agent has been observed.

Golding Bird says in his work on Urinary Deposits, page 159, "In fever, or where metamorphosis of tissue is actively going on, in addition to the abundance of nitrogenized products eliminated in the urine by the kidneys, a pink pigment, (purpuric,) very rich in carbon, communicating the well known tint to the secretion, also exists. *This state of things always occurs,* and affords a ready explanation of the characteristic *high color of febrile urine*, unless a great diminution of water or some other cause exist to explain it."

In Aitken's Science and Practice of Medicine, vol. 1st, page 362, when speaking of the urine of typhoid fever, he says: "The pigment at first is sometimes enormously increased, measured after Vogel's method (by comparison with a scale of colors). It has sometimes amounted to 80 or 100 in twenty-four hours, the normal amount being 3 to 6. This, Dr. Parkes says, is to be referred to increased disintegration of blood-cells; it is therefore much more highly colored than the mere concentration will account for."

Sherer discovered this purpurine in two cases of typhus and in one case of ordinary hectic fever, and goes so far as to give us in tabular form a comparative history of the amount of carbon, hydrogen, oxygen and nitrogen in the two diseases to account for the development of the coloring pigment.

Aitken again, on page 78, volume 1st, in referring to the general condition of urine in all forms of fever, says:

"The pigments also are increased, and the chloride of sodium is diminished. The deep color of febrile urine has usually been attributed to its concentration; but if febrile urine be diluted to the usual amount of fluid contained in healthy urine, it is still darker than normal urine. The coloring matter has been shown by Vogel to be increased sometimes fourfold, and it appears to contain more carbon than usual. This coloring matter in febrile urine is peculiar, and does not give any of the reactions of the bile-pigment. It may, according to Dr. Parkes, be considered as a measure of the metamorphosis of the blood-globules which in some cases may thus be four times as rapid in health."

Dr. Chambers, in his lectures on the Renewal of Life, page 453, when treating of the urine in albuminuria, with special reference to

this excretion in convalescence of scarlatina, remarks: "The presence of a red and smoky tinge in the urine is favorable."

Aitken, vol. 2d, page 725, in treating of pneumonia, says: "The urine pigment is increased two or three fold, or altered, and it tints the urates when they fall, brown, red or carmine."

Dr. Bird says on page 158 of his work already referred to, in speaking of purpurine. "The appearance of a flesh-colored deposit in the urine *is the commonest accompaniment of even slight derangement of the hepatic function, as every case of dyspepsia occurring in gin-drinkers points out.* The intensity of the color of the deposit appears to be nearly in relation with the magnitude of the existing disease. In the malignantly diseased, in the contracted, hobnailed, or cirrhused liver, *the pink deposits are almost constantly present in the urine.*"

Dr. Parkes, in his work on "The Urine," in speaking of the condition of that fluid in malignant variola, says: "There may be considerable amount of urine passed containing dissolved hematin."

Sherer, in the *Medical Gazette* for 1845, page 363, announced that any individual in perfect health, who would use a non-nitrogenous diet, and refrain from the usual amount of exercise, would have urine containing a large amount of carbon and hydrogen, and of course purpurine would be produced.

Dr. Golding Bird, after alluding to purpuric urine in simple hypertrophy of liver, from "*chill and fever,*" says: "The most beautiful colored deposits of purpurine *I have seen, have occurred in ascites.*"

Aitken, vol. 2d, page 945, says: "Blood-pigment or hæmatine dissolved in the urine, does not necessarily indicate local disease or rupture of vessels in part of the urinary organs. It must be regarded as indicating rather a special morbid condition of the blood as is associated with septic poisons, or with profound cachectic diseases. It may be observed in *typhus fever, malignant variola, remittent fever, yellow fever, scurvy and Bright's disease.* Albumen is said always to co-exist."

And lastly, Dr. Bird says, "I have occassionally seen purpurine occur in phthisis as well as in deep seated suppuration, as in proas abscess."

Another very valuable objection to the name purpuræmia as applied to this disease is, that purpurine is rarely met with in the urine of patients laboring under this malady.

To determine this question, the most plausible if not the most scientific method would be to refer to those observers who have carefully, accurately and frequently investigated the condition of the urine in this disease, and have published their researches. I will therefore briefly refer to some of the most valuable.

Dr. T. C. Osborn, and his son Dr. James D. Osborn, in their papers on this disease, published in the January number, 1868 and

1869, of the *New Orleans Journal of Medicine*, make no reference to the presence of purpurine in the urine, but describe the blood-corpuscles in that fluid as readily recognized by the microscope. These gentlemen were assisted in their examination by the chemist Prof. N. F. Lupton, who does not allude to purpurine at all, but distinctly states that the liquids submitted to him were "*a mixture of blood and urine.*"

Dr. Edward H. Sholl, of Gainesville, Alabama, in his valuable paper on this disease published in the October number, 1868, of the *Medical and Surgical Reporter*, does not allude to the presence of purpurine in the urine, but gives us the result of his observations, and states that the urine contained "*ragged, disintegrated and broken down blood-corpuscles.*"

It gives me pleasure in this connection to refer to a letter written me last month by Dr. Sholl. He says:

DEAR DOCTOR:

As I am an advocate of the presence of blood in the urine in "*hemorrhagic malarial fever,*" I enclose you the letter of Dr. J. C. Houston, the microscopist of our county society, and who prepared the urine for examination on which my article in the *Reporter* was based, so far as the microscopy was concerned. I saw with my own eyes the blood-corpuscles under the field of the microscope, and hence I reiterate my positive affirmation of the fact, which I thought was believed beyond a doubt. I have written to Dr. Webb to communicate with you on the subject.

I remain truly your friend,

EDWARD H. SHOLL.

WARSAW, ALA., February, 1870.

TO DR. E. H. SHOLL:

Dear Doctor,—Dr. Webb and I examined a specimen of the "so-called" bloody urine under the microscope, and came to the conclusion that we found *broken down blood-corpuscles*; we had no doubt of it. We sent a specimen of the same urine to Dr. Leidy, of Philadelphia, for examination and report.

Dr. Leidy did not examine the urine himself, but got a gentleman to do so for him; this gentleman wrote to Dr. Webb, and stated "*that he had beyond doubt found broken down blood-corpuscles,*" and gave a general analysis of the urine. I have forgotten the name of this microscopist. Doubtless Dr. Webb still has the letter and would furnish you with it for the purpose you wish.

Truly your friend,

J. C. HOUSTON.

LIVINGSTON, ALA., March 7, 1870.

TO DR. R. F. MICHEL, Montgomery, Ala.:

Dear Sir,—In a letter received from Dr. E. H. Sholl, of Gainesville, a few days since, he requested me to give you my views in regard to "*blood in the urine*" in the so-called cases of *hæmaturia*.

In accordance with this request I state that I am fully convinced from chemical and microscopic examinations, made by myself and Dr. J. C. Houston, *that blood does always exist in all specimens of this urine, and in many of them in large quantity*. In support of this I send you a letter from Dr. Tyler, of Philadelphia, in reply to a letter sent to Dr. Leidy with a specimen of the hæmaturic urine for examination.

I have in my office several specimens of urine, from which I select three, which I this day submitted to some chemical tests.

No. 1 was obtained November, 1868, (one year and four months old,) in the latter part of a severe attack of hæmaturia, from a male aged twenty-five who had been having occasional chills but did not seem to have suffered very much in general health. The specimen was obtained after he had commenced to improve. Present characteristics, bright cherry color, with a light colored deposit [phosphate of lime] not very copious—alkaline reaction [this is caused from formation of ammonia by decomposition of the urine, it was originally acid], specific gravity 1.014.

On heating over spirit lamp there is a copious flaky deposit [albumen], leaving the urine of a pale reddish hue. On addition of nitric acid to a fresh portion there is active effervescence, with the same flaky, dark deposit, leaving the urine the same pale red color; on heating this the urine is left almost colorless.

No. 2. [Same specimen sent to Dr. Leidy]. This is a very deep [almost dark] red, not enough to determine the specific gravity—alkaline reaction—heated in test tube over spirit lamp. Copious deposit dark and flaky [albumen] and urine left almost colorless. Same reaction on addition of nitric acid. Urine left colorless on heating.

No. 3. This specimen was obtained in November 1868, (one year and four months old). Deeper red than No 1, but less dark than No. 2. Same phosphatic deposits as in Nos. 1 and 2. Specific gravity, 1.016; alkaline —; when heated very slight flaky deposit; color changed to an almost inky darkness, with nitric acid; active effervescence; urine turned very dark; on heating almost black; slight flaky deposit. The notable facts in these tests are, that after a lapse of from eighteen to twenty-four months, the specimens retain their color unimpaired; a dark pigmentary deposit, (showing a perfect solution of the coloring matter), the deposit of albumen in two of the specimens, with very little in the other; and the entirely different action of heat and nitric acid on Nos. 1 and 2, and on No. 3, in regard to color.

The well known action of heat in destroying the coloring matter of blood in solution is well seen in the 1st and 2d, and entirely absent in the 3d. Also, in the 1st it is not perfect.

These facts point to more than one coloring principle in these specimens.

In the two first I should say there were evident indications of the coloring matter of blood, and while it may also exist in the 3d, its characteristic action is veiled by the coloring principle, which in this specimen I take to be the coloring principle of bile (biliverdine). In the 1st specimen the color is not entirely destroyed, and hence in this also I should expect the two coloring principles.

The 2d, (the one sent to Leidy,) in which the microscopist Dr. Tyler says "*there can be no doubt of the existence of blood,*" *the chemical tests after a lapse of two years are most characteristic of blood.*

I have given you these tests on these specimens after keeping them so long, thinking they might throw some light on the subject. I have not at hand (just at this time) the necessary conveniences for microscopical tests, hence I send you none. These, however, would be worth but little after so long a lapse of time.

To sum up all, *I am satisfied of the existence of blood in the urine in these cases,* and I believe it also contains another coloring matter to which in some specimens the deep color is due—some of them giving evident indication of *the coloring principle of the bile as well as blood.*

Hoping you may have an interesting session and regretting my inability to attend,

I am, very respectfully, yours,

R. D. WEBB.

It is needless for me to make any comment upon this able and emphatic letter of Dr. Webb. Sufficient to say, he has made up his mind upon the subject of *blood* in the urine of cases of hæmorrhagic malarial fever.

I must next in order give you the letter of the distinguished microscopist Dr. Tyler, to whom Prof. Joseph Leidy, of Philadelphia, entrusted the specimen of urine sent him by Dr. R. D. Webb, for careful chemical and microscopical examination.

No. 332 SOUTH FIFTEENTH STREET, }
PHILADELPHIA, October 15, 1868. }

To DR. R. D. WEBB, Alabama :

Dear Sir,—Dr. Leidy recently handed me a specimen of "*BLOODY URINE,*" which he desired I should examine and communicate the results of my examination to you. I made the examinations several days ago, but have been prevented by my engagements from writing earlier.

The urine, when it reached me, was very fetid, dark red in bulk, but brightly red in thin layers, alkaline in reaction, but was too small in quantity to admit of the determination of its specific gravity. It gave a copious albuminous deposit equal to about one fourth of the bulk of the fluid tested.

Microscopically there were evidently present the remains of *blood-corpuscles*, though the number of entire or *nearly entire corpuscles* were few. There was, however, much granular matter, insoluble in acids or alkalies, which was probably the granular debris of blood-corpuscles. A few undoubted granular tube casts were also found in each field examined, though no tube casts containing epithelial cells were discovered in careful searching. The urine also contained many crystals of the triple-phosphates, in part undoubtedly due to the alkaline fermentation.

Many of the features of the cases described in your note coincide with those characteristic of the so-called "*intermittent hæmaturia*," especially the intermittent nature, the causation and the effect of quinine. With regard to these cases of the so-called "*intermittent hæmaturia*," Dr. Harley of London, (in *Med. Chir. Transactions* for 1855), and Beale, (in "*The Practitioner*," London for August 1868), declare that the naked eye appearances have misled observers as to the cause of color. In the case described by Dr. Beale, he says that most careful examinations by the microscope failed to discover the corpuscular element of the blood, and the quantity of albumen was small. I believe he attributes the color to highly colored urates.

In this instance however, the quantity of albumen was large, though less than I have seen in some cases of Bright's Disease, and the remains of *blood-corpuscles* were undoubtedly present.

As to treatment, experience and theory go to show that what you have pursued is the very best.

Beale's case recovered under mild mercurials and large doses of the sulphate of quinine.

Very truly yours,

JAMES TYLER.

Again: Dr. Stanford E. Chaille, Professor of Physiology and Pathology in the University of Louisiana, writes me:

That in malarial hæmaturic urine much the larger proportion of the specimens examined by me undoubtedly contained blood-corpuscles. I must call your attention, however, to the following facts:

First. That most of the specimens examined by me have been brought to me from the patients of professional friends, who [not I] had diagnosed the disease.

Second. That never having entertained the least doubt as to the *blood-origin* of the color of the urine in malarial hæmaturia, I did not give to the subject that careful minuteness of investigation due to a doubtful matter, but only sufficient to confirm views which I regarded, and still regard, as beyond all doubt.

Yours respectfully,

STANFORD E. CHAILLE.

TO DR. R. F. MICHEL, OF Montgomery.

This disease became epidemic last year in Bullock County in the Eastern part of our State; and for the purpose of gaining additional information in regard to the character of the urine, a specimen was sent by Dr. Warmock to Dr. DaCosta of Philadelphia, one who has become distinguished in our county as a careful observer and an accurate and expert microscopist.

I take the liberty of giving *in toto* his letter in answer to Dr. Warmocks' inquiries.

PHILADELPHIA, November 18, 1869.

TO DR. WARMOCK, OF Alabama:

My Dear Sir—The specimen of urine you sent me and your letter both arrived safely. I cannot give you much information about the disease for it is one not personally familiar to me. I suppose it is similar to intermittent hæmaturia, which Beale last year described in his Archives of Medicine.

As regards the treatment, I should on general principles suppose that the mineral acids, iron and ergot would prove most successful.

The urine you sent me was albuminous, and was full of *shriveled* blood-corpuscles; it contained, moreover, some black pigment and flakes of an albuminoid matter; no fat.

So far, gentlemen, as my own experience is concerned, I mentioned last year, at our annual meeting in Mobile, that I had examined *ten specimens* of urine discharged by hæmorrhagic malarial fever patients; and that I had discovered in every one of them blood-corpuscles. Excuse me for quoting from my paper on this disease.

"The blood under the field of the microscope presented almost its usual appearance; some of the blood-corpuscles were rather attenuated but not broken down. A decided increase in the white-corpuscles was recognized; in addition to the hæmatin we thought we detected biliverdine coloring the field."

Since these researches I have had the opportunity of examining *eighteen specimens*, thanks to the kindness of my medical friends in the State, who knew that I was interested in the matter and sent me the urine. I found *blood-corpuscles* in sixteen of these specimens;

and in many of them *broken-down blood-corpuscles*. In only *two* were these objects absent, and the urine colored red; whether this redness was due to the presence of purpurine or hematin, I am not a sufficiently expert chemist to decide. I may state here, however, that in one of the two specimens the urine became quite cloudy on the application of heat.

I mentioned, (in making some remarks with regard to other cases presented for your consideration at our last meeting,) that upon one occasion, in Mr. Wm. Ware's case, the hemorrhage was terrible; and in that case the blood-corpuscles were perfect, so much so that I should have been willing to have presented them to a class as a proper illustration of healthy blood.

From what I have said to you it is evident that none of the gentlemen mentioned above have referred to the presence of purpurine, and some of the observers are well known chemists and microscopists.

Lastly. The substance first called purpurine or porphy-uria by Golding Bird, has as many appellations as the number of writers upon the subject. Simon dignified it by the name of uroerythrine, and thought it was identical with hæmaphæin. Heller called it uroxanthin, and uri-rhodin if it was red. I believe Berzelius meant the same thing when he speaks of halophyle.

In the 4th vol. of Todd and Bowman's great Cyclopædia, page 1270, a small paragraph is given to hæmaphæin, and one still shorter to uro-erythrine. Of this last it is briefly said, that "This exists in but very minute quantity in *healthy urine*; it becomes abundant in some forms of disease." Yet, when we are carried on to details of "urine in disease," discussed pretty fully, we do not meet with so much as the name of either of the above constituents. Rayer does not mention "purpurine" at all *eo nomine*, so far as I can discover. He differs from both Prout and Berzelius as to the coloring matter "les sediments roses et briquetés," which the first considers to contain "purpurate d'ammoniaque et de soude." Taylor also thought that he found the purpurates of ammonia, and Berzelius says that "L'acide purpurique est d'une jaune claire, et que la purpurate d'ammoniaque passe au rouge, même tant le contact de l'eau Rayer," vol. 1, page 125. For himself, Rayer says he attributes the color to "une matière colorante particulière." Vanquelines "Acide rosacique," and below, on page 202, "on observe les sédiments roses surtout chez les individus atteints à l'hydropisie, de cyrrhose de foie." In his 3d volume, page 370, he gives some interesting statements of the relation of "*Hamaturia*" to diseases generally, and refers to cases from Elliotson, Gergeres and Stewart of its occurrence "*intermittently*" and its cure by quinine, suggesting a causative dependence on malaria.

Others, before Golding Bird, speak of "purpuric acid" and "purpurates."

I find no notice of its vicarious discharge from any other organ than the kidney. Leowig tells us that he procures it from a vegetable source—madder. N. Lowig's Organic Chemistry, page 419 purpurin [rubiacin].

The answer is to be deduced from what is said above. If Vanpuelin and Rayer are right, the coloring matter which we understand by the term purpurine is formed by the union of *rosacic acid* with soda and ammonia, or in combination with the lithates; according to Prout and Berzelius, it results from a similar combination with purpuric acid: but I do not find that the *base* of rosacic or pupuric acid has been separated, it is not clear therefore what purpurine is. Dr. Golding Bird, who christened it with this appellation, says on page 157 of his work on Urinary Deposits: "*The chemical composition of purpurine, occurring as a product of disease, is unknown.*"

There is one point in the history of this disease of some interest, and I will only refer to it at this time:

Whether hæmorrhage can occur without rupture or laceration, or loss of continuity of structure. This is an undecided question. Conheim sees the *white* globules penetrating the walls of the vessels. Why not the red? I ask. In general, however, I suppose there is destructive change of the organism from which blood exudes in any notable quantity.

I suppose I may be accused of egotism in quoting the last paragraph of a letter to me from my friend and preceptor Dr. Samuel Henry Dickson, but I value his opinion upon the subject of pathology ~~and~~ the diseases of our region of country more than I do any other author, and although I am complimented, an opinion is here expressed which I feel you will value, and I am unwilling to keep from you. the

"You ask which name I prefer for the terrible disease you have so well described under the title of '*hæmorrhagic malarial fever*'—that appellation or '*purpuræmia*.' I reply, the former certainly, as the most specific and significant. '*Purpura*' is a well known form of disease which is described apart. I wrote when I received it, to acknowledge your paper, and made use of it with reference to yourself as its author in my lectures."

Permit me to apologize for detaining your deliberations, but I thought it incumbent upon me to reiterate my belief that we had a *malarial fever* in our country, in which form of disease we had *hæmorrhage from the kidneys*, and death resulting in half the number of published cases. I do not think the term *purpuræmia* a correct one, and hence I have thought proper (though a rose by any other name would smell as sweet,) to mention my objections in full for your consideration.

