

Correspondence.

On the Quality of American Files.

To the Editor of the Scientific American:

My attention has been called to remarks made by Mr. A. D. Pentz, in your publication of February 4, practically putting his experience as against my knowledge obtained within the four walls of my manufactory. To correct Mr. Pentz in the supposition that this knowledge has been obtained from one source, I would say that from seventeen to twenty-five years of age, I was every day handling and selling and talking to dealers and consumers the Grobet, Stubs, Reilly Carr, Jowett, Morse & Gambell, John Martin, Greeves, and other makes of English files. I began my experience with a firm who were large and direct importers of the Grobet and Stubs files, and exclusive agents for John Martin's English files, of which they imported some 500 casks. I ended my experience, before going into the manufacture of files direct, as agent for a house who carried in New York a stock of \$40,000 in imported files. I know of no better way of getting a correct opinion as to the quality of goods than to deal with the unprejudiced and prejudiced mechanic. One soon has an opportunity to sift the good from the bad, and I claim that the information which I obtained in handling imported files of various makes for ten years, prior to going into the manufacture of the domestic article, was more accurate knowledge and better information as to various qualities of files than Mr. Pentz was able to obtain in his thirty years' experience as a practical machinist. In justice to myself I would not wish the public to form the impression, through what Mr. Pentz has said, that my knowledge was confined exclusively to my own product.

New York, Feb. 7, 1893.

J. D. FOOT.

A Pharmacial Columbus.

The celebration of the year 1893 is not exclusively one devoted to the discovery of America, as far as pharmacy is concerned.

Contemporaneous with this great event, just 400 years ago, a man was born of whom it may justly be said he was the "father of pharmacy." On December 17, 1493, in Maria Einsiedeln, Germany, was born an individual who was named Theophrastus Bombastus von Hohenheim. Possibly because of this high-sounding name, but more probably to avoid criticism of being designated as "bombastic," a term applied to his utterances, he assumed the name of Paracelsus; and as such he is known to pharmacy.

Paracelsus is the founder of iatrochemistry, through which the tendency of the middle ages to speculate upon the transmutation of the metals was turned in the direction of the search for the "elixir ad longam vitam," or the elixir of long life. Paracelsus believed that specifics could be found among plants and animals for all the ills that flesh is heir to. The tincture of aloe and myrrh is a survival of the "elixir proprietatis," or "elixir Paracelsi," which originally contained a much greater number and variety of ingredients.

It is more than a coincidence that the eventful year of 1893 should also be the quadri-centennial of the birth of this pioneer in pharmacy. The great convocation of pharmacy on the continent whose discovery simultaneously with his birth lent such great impetus to the world's materia medica, might well honor this polymorphous and polypharmaceutical character.—*Western Druggist.*

Henry Sargent Codman.

Henry Sargent Codman died suddenly, after an operation for appendicitis, on the 13th of January, at Chicago, where he had charge of the landscape department of the Columbian Exposition. No man at his age had ever accomplished more in his profession, or gave brighter promise of what could confidently be expected from his matured powers.

Mr. Codman was born in Brookline, Mass., on the 19th of June, 1864. He graduated at the Institute of Technology in 1884, and almost immediately entered the office of Mr. Frederick Law Olmsted. In the summer of 1887 he traveled with his uncle, Professor C. S. Sargent, through England, France, Germany, and Italy to study living collections of plants, nurseries, parks, and gardens. Soon after, he went to Paris and pursued his professional studies for more than a year under the direction of Edouard Andre, and on his return he was taken into partnership by Mr. Olmsted. Since then he has been intimately associated with Mr. Olmsted in all the important works that have been carried on by that firm, including the design of the Exposition Grounds in Chicago, in the construction of which he has been practically the executive head from the outset. Mr. Codman was tall, strong, of commanding appearance, and apparently of great constitutional vigor. He had inherited a profound love of natural beauty, and his taste had been disciplined and refined by close observation and wide reading. He was thoroughly acquainted with the literature of his profession. His library in this department was unequalled in this country, and his index of works on the subject,

published in this journal, was the most complete that has yet appeared.

He invariably gained the confidence and esteem of all with whom he came in contact professionally, and he was remarkably successful in impressing his opinions upon them and leading them to see things from his point of view. That he won the affection as well as the respect of his associates was remarkably manifested in his Chicago work, where he came into warm comradeship with almost the entire corps of artists, and where he helped, no doubt, materially, to bring about that sympathetic co-operation and unity of purpose which has been so marked among them. This was due partly to the fact that from his position he stood for the one uniting element and represented among the various professions and crafts the general design in its comprehensiveness and consistency. But his professional position was made effective by his personal qualities and accomplishments—by that broad, liberal, and catholic cultivation which brought him into cordial and appreciative relationship with all the artists in all their varied fields. His leadership was, therefore, natural and spontaneous, for, although he was modest almost to diffidence, he never shrank from assuming responsibility. He had the moral qualities which mark the master, in addition to the highest intellectual appreciation of the possibilities of his profession, and in view of what he was and of the relations he had established with so many of the foremost architects of the country, his untimely death must be lamented as a serious loss to rural art in America.—*Garden and Forest.*

ATMOSPHERIC PRESSURE.

Completely fill a tumbler with water, and carefully cover it with a small sheet of thick paper, press the paper firmly upon the surface of the fluid with the palm, then cautiously invert the tumbler, and remove the hand. The paper will be held in place, and the water thus prevented from flowing out, by atmospheric pressure, as shown in the cut. The influence of this surface pressure on the boiling points of liquids is plainly illustrated by an experiment shown below, and described as follows: Half fill a Florence flask with water, boil the water until air is displaced and the dome of the flask is filled with steam, cork tightly, quickly remove the Bunsen burner, and invert the flask. When the flame is removed the temperature of the water will not be more than 100° C. (212° Fah.), and by the time the flask is inverted and boiling ceases it will naturally fall below the boiling point. If cold water be now poured carefully over the top of the inverted flask it will cause the water to boil fervently. The cold water, of course, lowers the temperature of the water in the flask still further, but it also condenses some of the steam, and, by thus forming a partial vacuum, lessens the work necessary to boiling. There being enough heat left in the water to accomplish this lessened amount of work, the water boils again until stopped by accumulation of pressure. The flask may be drenched and the water made to boil a dozen times in succession with a single heating, or the experiment can be made more striking by plunging the whole flask under cool water.

At the sea level water boils at 212° Fah., under ordinary atmospheric pressure, which is stated to be 14.7 (nearly 15) pounds to the square inch. If the atmospheric pressure be reduced or removed, by means of a vacuum apparatus, the boiling point is reduced—to 100° Fah. or less. If the pressure be increased, as it is in a steam boiler, the boiling point of the water is proportionately increased—to 350° Fah. or more. It must also be remembered that as we ascend above the sea level the atmospheric pressure grows gradually less, and the boiling point of water is correspondingly lower. Water boils readily on Mount Washington at 200° Fah., and upon Mont Blanc at 185° Fah.—*Bulletin of Pharmacy.*

City Pavements.

Mr. Thomas Appleton says: It is a common, but I believe erroneous, notion that the joints or seams between the blocks of a pavement are essential for a foothold for horses. I grant that with any hard stone which polishes under wear it is absolutely necessary that there should be a limit to the polished surface in order that the horse can stand up at all, but a horse is less liable to fall upon a macadam or asphalt pavement than upon a stone pavement, and the yielding surface of the cedar block pavement gives a better foothold than brick or stone. In my opinion, sheet asphalt should be transferred to the other end of the list. It has such a perfect surface that a horse's hoof comes immediately into position for work, there is no rocking of the fetlock joint, no slipping down into a

crevice, no sliding off from a rounded summit. Besides, no such effort is required to start a heavy load as is necessary in starting on a stone or brick pavement. I should rank the materials under this classification as follows: Sheet asphalt, macadam, cedar block, brick, granite, cobble stone.

I doubt the utility of tables giving the cost of pavement for so long a term as fifty years. There may be several better pavements invented than any we now know of within the next ten years. One generation is about as far ahead as we ought to look.

In the present state of the art, I believe that for Chicago and its immediate vicinity there are but two kinds of pavement to use: First, if the abutting property can stand it, sheet asphalt; second, sapless cedar blocks.

On the Danger of Safety Matches.

BY B. L. PROCTOR.

A few weeks ago one of my staff, when lifting down from a high shelf a few packets of patent special safety matches, let two of the packets (each containing a dozen boxes) fall to the floor. This was followed by a sudden burst of smoke from each of them—a result I had not at all anticipated, but which prompted the inquiry how far the matches could be regarded as safety matches, and whether they were really free from phosphorus, as is generally understood.

One thing evidently in favor of safety was that the fire, which destroyed several boxes in each packet, left as many more uninjured. There was fire, but it was all confined within the thin paper wrapper which contained the dozen boxes.

Chemical examination soon proved that the matches did not contain phosphorus, and experiment further proved that the statement was not true which says that the matches will light only on the box.

As this fact was unknown to me up to the present experience, it will probably be new to many others who deal with these articles and who ought to know how far danger may be increased by the supposition that danger does not exist.

It was soon found that by pressing the tip of one match against the tip of another and then suddenly drawing one across the other, one or both of them were ignited. This was, no doubt, the way in which ignition took place within the boxes, where the match tips were, of course, in contact, and where that particular sharp friction would be produced by the concussion of the packet upon the floor.

I find Roscoe and Schorlemmer,* under the head of "Phosphorus," give a formula as follows:

Potassium chlorate.....	32 parts.
Potassium bichromate.....	12 "
Red lead.....	32 "
Sulphide of antimony.....	24 "

This mixture contains no phosphorus, and, as a rule, it will only ignite on a surface strewed with a mixture of amorphous phosphorus and sulphide of antimony. If, however, these so-called safety matches be quickly rubbed over a surface of glass or a smooth sheet of paper, they can be made to take fire.

I do not know whether I had seen Roscoe's statement previous to this little accident, but if so it had not impressed me. Experience is a more emphatic teacher than a text book.

Previous to my reference to Roscoe I had found it possible to ignite the safety matches upon the pages of the day book, upon the office window, upon a long palette knife, upon porcelain jars (glazed or unglazed), and some other materials, a long, rapid stroke being most effective. Subsequently I repeated the experiments and had failures with the same kind of matches made by the same maker. It may be that the matches vary a little in composition unintentionally, or they may change a little with keeping, or it may be that it depends upon the degree of dryness. The matches with which the accident occurred, and which ignited on various surfaces without much difficulty, had been in a warm dry position for a month or so, while those with which failure to ignite with simple friction was experienced had been kept in what might be considered normal conditions—conditions which did not interfere with their lighting on the box, but which made it very difficult, if not impossible, to strike them effectually upon common materials. After two or three hours' drying before the fire, striking on paper and porcelain again became effective, though not easily so.

The conclusions indicated are:

That the matches do not contain phosphorus.

That it is not true that they will strike only on the box.

That when very dry concussion may ignite the boxful.

That in case of ignition the fire does not spread readily, as it would do if the matches contained common phosphorus or free sulphur.

That a small degree of dampness which may be considered normal under ordinary circumstances does not interfere with their use according to rule, and renders them practically free from danger.—*Chemist and Druggist.*

* "Treatise on Chemistry," 1877, vol. i., page 474.