WHO IS DR. VANDER WEYDE?

During the past few weeks, an esteemed correspondent, J. W. Nystrom, Esq., C. E, of Philadelphia, has furnished to our readers several interesting communications, some of which have been answered and criticised by another of our valued correspondents, Dr. P. H. Vander Weyde, of this city. From the tenor of the following letter it would seem that our Philadelphia correspondent is a little suspicious of the respectability of his antagonist. But we can assure him that, in Dr. Vander Weyde, he has a foeman worthy of his lance.

To the Editor of the Scientific American:

SIR :—Will you be kind enough to inform me, through the SCIENTIFIC AMERICAN, if Mr. P. H. Vander Weyde, of New York, has a doctor's diploma, and if so, from which college he has received that title? And what kind of a doctor is he?

The answer to these questions will greatly oblige yours very respectfully, JOHN W. NYSTROM.

1010 Spruce street, Philadelphia, Pa., Sept. 7, 1872.

We would inform our correspondent that Dr. Vander Weyde is a physician of the strictest orthodox sect; that he is an honored graduate of the New York University Medical College, of which John W. Draper, LL.D., is President; that he holds the regular diploma of that institution; that he enjoys the fellowship and esteem of many of our leading physicians and prominent men of science; that he is a native of Holland, where he received a university education; took the degree of Doctor of Philosophy in 1840; was the editor of a scientific periodical; in 1845, at Amsterdam, he received the honorary prize, consisting of the gold medal of the Society of Sciences for his essays upon natural philosophy.

Dr. Vander Weyde is now a citizen of the United States. From 1859 to 1864, he was Professor of Physics, Higher Mathematics and Mechanics at Cooper Institute in this city. During nearly the same period, he was also Professor of Chemistry in the New York Medical College. From 1864 to 1866, he was Professor of Industrial Science in Gerard College, Philadelphia, Pa. His contributions to the scientific literature of the day have been very extensive, and are widely known.

These are only a few of the items of Dr. Vander Weyde's public record. But they are sufficient, we trust, to satisfy the enquiries of our correspondent, and remove from his mind any adverse prejudices that he may have formed concerning the qualifications of the distinguished gentleman whose public standing he has questioned.

CHEMICAL MEANS OF PREVENTING SCALE IN BOILERS.

In a recent number, we treated of the means acting mechanically to prevent the formation of deposits in boilers. In the present article, we propose to consider the efficiency of various chemicals, proposed from time to time for the same purpose.

Among the alleged remedies, the first to be considered are those which effect a decomposition of the gypsum (sulphate of lime) and convert it into insoluble but pulverulent carbonate of lime. The cheapest substance of this kind, and the one which would first suggest itself, is carbonate of soda, first proposed by Kuhlmann and recently again by Fresenius. We shall see that some authorities have affirmed that this substance may itself be detrimental; that a large surplus may corrode soldered joints or dissolve putty, if any be used. On the other hand, others maintain that they had used carbonate of soda for years with decided benefit and without detecting any such damage to the joints of the boiler. In all cases, it will be proper to regulate the addition of this material in such a manner that it will just suffice to decompose the sulphate of lime in the feed water.

Fresenius has recommended a ready method for ascertaining the quantity. To a measured volume of the feed water, a solution of carbonate of soda of known strength is added, until no further turbidity takes place. When the white precipitate has deposited itself, some lime water is added to a sample of the clear liquor; if it becomes very turbid, too much soda has been added; and the contrary is the case if, in the clear liquid, a further addition of carbonate of soda produces cloudiness. But if the liquor remains clear, or if it gets only slightly cloudy, the right quantity has been employed. From the proportions used in these tests, the quantity necessary to be added to the feed water may readily be calculated.

Soda is employed in various manners. Runge recommended boiler tenders to draw off the clear water from the deposit, which would be unnecessary labor; for if particular precaution be necessary that the required amount of soda be not exceeded, the mixture may be made in the feed water heaters or in another vessel, before being pumped into the boiler. The ordinary way of procedure consists in putting in the boiler sufficient soda to last some time. It is evident that, in such a case, it must be considerably in excess in the beginning, and that it will be used up in time. In such instances, it is possible that the boiler is injured by the surplus of carbonate of soda, and some writers maintain that the cause is to be attributed to cyanide of potassium, from which commercial carbonate of soda is rarely free. Kuhlmann recommends the use of two or three tenths of a pound of soda per horse power per month. It is evident that this proportion can only be an approximation, from the fact that the conditions vary according to the construction of the boiler, the tension of the steam, the duration of a day's work, and, primarily, to the nature of the water. The sulphate of lime is converted into carbonate of lime (and so loses all its adhesiveness) when boiled with a solution of potash or soda; these two substances may also serve for the cleaning of incrustated boilers. And we must here remark that those in favor of the use of soda declare that such boilers as become leaky only remained tight in consequence of the scale which incrusted therein. In case the scale should not be completely dissolved by soda, dilute muriatic acid may afterwards be tried, the employment of which would be ineffective if soda were not used beforehand; but this remedy should only be resorted to in case of the utmost necessity and in simply constructed boilers. Due precaution should also be taken that the acid be completely washed out.

With regard to the substitution of caustic potash or soda for the respective carbonates, the result remains the same, and it is not clear to the writer, why the more expensive caustic alkalies are to be preferred to the cheaper carbonates. Muriatic acid and chloride of barium, in mixture, are only to be employed with great caution. By the addition of the latter, sulphate of baryta is produced from the gypsum of the water, as well as from the other sulphates. Respecting the muriatic acid, it is added for the purpose of dissolving the carbonate of lime; and it is stated that it is preferable to use the clear water only, although sulphate of baryta does not form any cohesive and adhesive deposit. The danger of using muriatic acid need scarcely be pointed out.

Carbonate of ammonia plays a part corresponding to that of the fixed carbonated alkalies; it precipitates the solution of the bicarbonate of lime, as well as that of the sulphate of lime, and forms sulphate of ammonia with the latter. Since a part of the carbonate of ammonia volatilizes always with the steam, one must not use the steam for purposes wherein the volatile alkali could be hurtful, as for instance, in steaming cotton tissues printed with topical colors, or for heating dyers' vats, etc. The other ammonia salts, such as sal ammoniac and the acetate and nitrate of ammonia, act quite differently. This becomes obvious when we consider the part which sal ammoniac plays. O. Smith observed that one equivalent of freshly precipitated carbonate of lime, when boiled with one equivalent of sal ammoniac, forms chloride of calcium, and that carbonate of ammonia passes off from the boiling liquid. Gypsum and carbonate of lime in presence of sal ammoniac are converted into chloride of calcium, carbonate of lime and sulphate of ammonia. Elsner was of opinion that sal ammoniac fulfils every reasonable requirement, and he considers one part sufficient for 1,200 parts of spring water. There is no doubt that sal ammoniac renders good service in dissolving scale, but it must not be overlooked, however, that all ammonia salts corrode stop cocks and other parts of the boiler made of brass.

Regarding substances containing tannin, they act by producing tannate of lime, a substance of slimy consistency which deposits itself without adhering to the walls of the boiler. Among them we enumerate extract of oak bark, gall nuts, tan bark, catechu, etc. Elsner found the wild growing tormentilla root very suitable. Cavé patented the suspending of oak blocks (from four to six pounds per month per horse power), and Roard recommends mahogany sawdust in the proportion of eighteen quarts for a ten horse boiler for every three months. Some of these materials possess also a mechanical action, about which we spoke in our previous article.

THE MARRIAGE OF FATHER HYACINTHE.

In the month of July, 1867, by the favor of a United States senator who was returning from abroad, we received a small package containing three corsets, accompanied by a letter dated at Paris, written in a clear and business style, directing us to take immediate steps to secure a patent on the article in the United States. "And can you," says the writer, "recommend to me a good, smart, honest Christian lawyer, a saint, to attend to all my affairs relating to my invention?"

In a subsequent letter concerning her patent business, she commences: "I beg you will not allow this letter to leave your left hand till your right hand answers it." And again she writes, from the Alps: "Here I am among the eternal snows, clouds, rocks, monks, and dogs of St. Bernard." During the pending of the application before the Patent Office, we received a number of letters from our fair client, all of which bear evidence of the writer's genius and superior business qualifications. In the patent records for September 8, 1868, may be found the name of Emilie J. Meriman, patentee of an improved corset. It is to this lady that Father Hyacinthe, the eloquent and gifted Frenchman and Catholic clergyman, was married the other day in London. The new wife of the reverend father is very beautiful, and is gifted with rare talents.

This marriage will not, we presume, be promotive of a reconciliation between Father Hyacinthe and his former religious order, and we therefore indulge the hope that it may influence him to seek in this, the native land of his bride, a new and happy home. He would be cordially welcomed here, and as a citizen of the United States would enjoy the most extensive opportunities for usefulness.

PATENT OFFICE ITEMS.

The Commissioner of Patents has granted an extension of the patent of Theodore Heermane, of Illinois, for coffee roaster, and of Harlow H. Thayer, of Boston, Mass., for journal boxes, and has refused an extension to Clayton Lippincott, administrator of Sherburne C. Blodgett, deceased, of New Jersey, for sewing machine.

Lewis W. Haupt, C. E, Assistant Examiner in the class of Civil Engineering and Architecture, has resigned his position to accept the chair of Assistant Professor of Civil and Mechanical Engineering and Mathematics at the University of Pennsylvania.

The receipts of the Patent Office during the month of August last were $57,217.75.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

BITUMINOUS COAL AND IRON MANUFACTURE.

Professor E. B. Andrews, State Geologist of Ohio, read before the Association, at its recent meeting at Dubuque, an interesting paper on coal. He states that, so far as his observation extends, a coal seam has never been accumulated on high grounds, or ground above water level; and such formations could not take place, because it would be impracticable to establish the conditions of accumulation on the side of a hill. Hence it is impossible in the nature of things that two distinct seams of coal could ever coalesce, since their subsidences must take place in parallel lines. To suppose otherwise would involve a very unequal subsidence over very limited area, amounting, indeed, to a convulsion of Nature, which is almost incredible. For example, Professor Andrews has yet to see two seams of coal 50 to 100 feet apart in one place come together in another within a distance of a mile or a few miles so as to make one seam, though the contrary has often been asserted by other explorers. The apparent exception to this is in cases where a small local basin of coal has been formed and subsequently filled in with clay sediments, and after that a new coal seam has been established, like a lid to the basin, and continuous with its edges.

Referring to the solidification of coal, which is generally considered an exceedingly slow process, Professor Andrews states that it is comparatively rapid. Thus it appears that where a gully has been torn out of a coal seam by a rapid current of water, the small boulders, washed by it over the covering stratum of sand a few feet above, are complete coal, having an angular fracture, some being still sharp on the edges and some being slightly water worn. These boulders in turn have again been covered by subsequent depositions and are found at considerable depths, near the base of the coal measures.

There are three leading varieties of bituminous coal; the ordinary resinous or caking coal, the splint, and the cannel coal. These pass into each other by almost imperceptible gradations. The resinous coal seems to be the normal condition which the buried vegetation first assumes, and splint and cannel are modified forms, the cannel coal having lost all trace of structure, and containing no organized forms except stigmaria, which are very abundant. The ash of coals is the original inorganic matter of vegetation, often increased by sedimentary matter in the marsh during the formation of the coal. The lowest percentage of ash observed by Professor Andrews in Ohio coals is 0·77 per cent. Sulphur is found in all coals, being a part of the original organic compounds, now combined in part with iron, as iron pyrites—sulphuret of iron,—though not necessarily so combined, as Professor Wormley has abundantly shown in his chemical examination of the Ohio survey. Sometimes the sulphur is so exclusively combined with the more bituminous element of the coal as to pass off entirely with the gases in the operation of coking, leaving the coke almost as pure as charcoal. Coals of this kind are specially adapted to the blast furnace, the sulphur passing off in the top of the stack without detriment to the iron. Coal for the blast furnace, if used in the raw state, must be a dry burning coal, so as not to expand in coking and thus choke the furnace. The coke of the dry burning coals has a tendency to be less firm than that made from the more bituminous or coking varieties, and consequently will not so well sustain in the blast furnace the weight of the superincumbent materials of the charge. The coke made from the softer coals, like the Newcastle of England and the Connellsville of Pennsylvania, has a hard, cinder-like formation, enabling it to bear the burden of furnaces of great hight, those of England sometimes exceeding 100 feet. As a practical matter, it is absolutely necessary that iron masters should adapt their furnaces to the peculiar physical properties of the coke produced by the coals they are using. A high furnace with a weak, tender fuel must necessarily meet with disastrous results, unless, by simple mechanical contrivances, the vertical pressure of the burden can be relieved and the coke at the bottom of the furnace allowed to rest lightly and not under heavy weight; thus securing the most intense and perfect combination of the carbon at the base of the furnace. Such contrivances are by no means impracticable.

TEMPERATURE OF THE POLAR REGIONS.

Professor Wheildon, of Concord, Mass., advances, in opposition to what is known as the Gulf Stream theory, an atmospheric theory to account for ameliorations of climate and an open sea in the polar regions. The accounts of arctic voyages, it is stated, show sudden rises of temperature when nothing but an unlimited extent of ice is near. These changes, it is considered, could not have been consequences of proximity of open water, which, at best, would be of 29° temperature. The theory of Professor Wheildon is that open water, melting ice, rain after snow, and other phenomena of the sort in arctic regions, are not caused by winds warmed by an open sea, but by a circulation of air in which warm winds descend from upper atmospheres; being a circulation by which winds heated at the equator reach the poles.

INSECTS SHAPED TO THE NEEDS OF FLOWERS.

The flowers of the Yucca plant are peculiarly constructed so that it is impossible for the pollen to reach the stigma, it being glutinous and expelled from the anthers before the blossoms open. It has been therefore the opinion that the plants must needs rely on some artificial agency for fertilization. Professor C. V. Riley, of St. Louis, has lately discovered that the work is done by a small white moth which he calls *pronuba Yuccasella*, and which forms the type of a new genus. It is most anomalous from the fact that the femaly only has the basal joint of the maxillary palpus wonderfully