concerning Valentine which it is the purpose of this note to resolve.

This personage was never heard of until, in 1599, Johann Thöle published, as editor, the first of six treatises in the German language which he successively gave to the public as having been written by 'Basilius Valentinus, Benedictine monk.' The last of these, published, according to Kopp, in 1604, and entitled Triumph-Wagen der Antiqui-

suni, is the one upon which the renown of Valentine exclusively rests. All are works of alchemy, a doctrine that, at the time of their publication, had for generations been a mark of derision. I have only seen four of them, the Triumph-Wagen, the Welt in Keimen, the Große Stein der wahrăen Weisheit, and the treatise Von natürlichen und über-

naturlichen Dingen. The Triumph-Wagen is the only one I have carefully studied.

I begin with a logical consideration. It is very important to bear in mind, at the outset, that the all but universal custom of alchemists was to publish their writings as having been handed down from remote ages. This custom had been traditional since the remotest periods of Egyptian alchemy. Besides, there was an obvious reason for it. Announce to the world that a gold dollar costs you a dime, and either you are poor, when your neighbors will laugh at you, or your circumstances are comfortable, when you will be benefited by importunities as well as exposed to the resentment of those who dread your overturning the existing state of property. So it would be even in our well-governed age; how much more in wiser states. For this reason, although for books in general the prima facie presumption that they were written by the persons whom they name as their authors is even stronger than critics are apt to think, yet for alchemical books this initial presumption is reversed. If a book of alchemy professes to be written by an adept, that is, by one who can make gold, there is a probability amounting almost to certainty that the real authorship is concealed, and if it professes to be written long before its publication the presumption, founded on the general practice of such writers, is that the real author is he who has given it to the world. That is the theory which logic demands should first be tried.

Now these books of Valentine state repeatedly that the author has achieved the 'great work' of the alchemists. Hence, until facts drive us from the position, we ought to begin by presuming that 'Basilius Valentinus' was the nom de plume of Thöle. Nevertheless, in order to satisfy those who may not assent to this view, I shall begin by showing that it is impossible to believe the averments of the books themselves in regard to their authorship.

First of all, a sketch of the contents of the four treatises above named may be interesting. The tract 'Von der Weisheit in Keimen,' or, as it is entitled in the edition I use, 'De Microcosmo, oder von der Kleinheit des menschlichen Lebens,' fills half a small octavo page. The author speaks with an attempted explanation of the creation of the universe, or Macrocosm, and of man, or the Microcosm. The matter out of which the world was formed is nothing. The
er Freudheit zu ihm, und nahm das Wasser zu der Ehe, und ward aus ihnen beyden ein unverbrünnlich Oel, denn der Mercurius ward also stolz, dass er sich selbst nicht mehr kaute, er warf seine Adler-Fügel von sich hinweg, und verschlang selbst den glatten Schwanz des Drachen, und bote dem Morti an zu kämpfen, da fordert Mars seine Ritterschaft zusammen, und verschuf, dass man Mercurius mußte gefangen nehmen, und ward ihm Valvasor zu einem Stockmeister verordnet, also lange er vom weiblichen Geschlechte wiederum erlosten würde. Ich cannot help fancying that I am able to detect here a certain lack of scientific precision and perspicacity. There are books which undertake to explain how to translate that sort of thing, telling us, for example, "siquaque vocator lapsus spiritus quinque essentiae quanduoque vocatur terra, quandooque lapid." Probably by the aid of such a key the chemical processes of this treatise could be conjectured. I have not undertaken the task, being assured by the experiences, that I should only find vague hints of nonsensical notions. Upon a long oratory disquisition follow twelve chapters entitled Keys. Each of them is furnished with an emblematic busture.

The treatise Von den naturlichen und aber naturlichen Dinges is written in a somewhat plainer style. After repeating the definition of the tria principia, it enters upon discussions concerning biblical miracles, the signs of signatures, spirits, signs, success, etc. Chapter the second treats of the first "Tinctur-Ware" of the metals, which, we are told, is "a supernatural, flying, fiery spirit" which keeps itself in the air, and naturally seeks its habitation in the ground and in water. The remaining seven chapters treat in cryptical style of the methods of dissolving the seven metals. The Triumph-Wagen des Alchimisten contains, embossed in vast masses of speechifying about thirty plainly described chemical preparations. Of these, seventeen are genuine descriptions of experiments by a skillful chemist, and are distinguished from the few perspicuous chemical directions that are to be found in Raimond Lully, in Arnold de Villeneuve and other medieval alchemists by the far higher grade of chemical knowledge which they evince. The remaining experiments seem to me to be conjectures never put to the test. Without such an element of fancy the theory of a medieval origin for the book would be almost absolutely valueless; from its presence nothing at all can be inferred. The German of all four works seems to me later than Luther's Bible. Upon this matter I must speak with difference; however; but I leave it to the reader to compare the specimen above given with any page of Paracelsus and see which is the more modern. I cannot see how there can be room for two opinions.

The author is, in the text of each treatise named, as 'Fraer Balianus Valentinus, Benedictus Orsens.' The first three works contain little concerning his personality or age. Yet the author's preface to the Grosse Secia tells us that, 'da mir Menschenacht Pecht zu Handen sties,' he was led to religious speculations. He joined the Benedictines, and after he had been a monk for 'good ten or nine years' he determined to write his own letters to the letters of the natures, and to considering what effectually so much he should find the highest. He diligently studied many books which he found in the monastery, written by wise masters who had investigated the natures. Subsequently, in the desire to cure a sick brother, he took up the distillation of herbs, and this investigation occupied him for six years. At the end of that time he began to extend his chemical studies, and gradually went on from one thing to another.
man abbot, says it came both ways.* It was much later, during the 16th century, that the theory of a French origin became generally accepted as certain.*

But passing by this difficulty, and continuing to accept the seven passages as bona fides, to what date do they point? Johannes Balthasar, whose work on this pestilence was printed in 1501, says that it had prevailed in Germany since 1497.† The records of a Tri- mump-Wagen cannot possibly have been written later than 1460 or 1470.

Just as this indication of a date occurs thrice, so there is another which is dragged in by the head and shoulders no less than seven times in the book. It is a reference to a certain disease as having recently appeared which at the time of Thölle's publication was generally supposed to have made its first appearance in 1498. Were these seven references inserted in order to create a belief in the priority of the book to Paracelsus, or was the book really written when that disease was something new? The name which Basil Valentine gives to this disease is very suspicious. In Germany in the 16th century it was commonly called "die wilde Wetzen,"** but it had various other designations. Valentine, however, uses none of these. Here are his expressions:

"Die neue unbekannte Krankheit so in jetzigen Krieg-Zügen in diese Laude eingeführt worden durch die Wunderhaftigkeit und Armut,"*

"Die neue Krankheit,"*

"Die neue Krankheit des Kriegs-Leute in dieser Zeit,"*

"Die neue Kriegs-Sucht,"*

"Die Krankheit der Gallier neulich auf uns gerichtet,"*

It is doubtful whether the malady was brought to Germany from France or from Naples. Thrombosis, a contemporary German product, was easily procured. And, indeed, in Chapter III. of his earlier treatise On Natural and Supernatural Things, he himself affords the quite superfluous testimony that in his time paper mills abounded. It is always and everywhere recommended 'grobe Papier' for filters. Either, then, the talk about the necessity of abridging his book in order to economize parchment was inserted in order to impart a medieval taint, or else the Triumph-Wagen cannot possibly have been written later than 1460 or 1470.

The Triumph-Wagen contains more than one indication from which to infer the age of the author. It also, by the way, informs us that he lived 'oberhalb Rhein,' that is, in the Upper Rheingau, or, say, somewhere south of and not very far from Mainz. The author in the Triumph-Wagen, no less than three times, speaks of the desirability of economizing parchment. Now, it would have been an unusual extravagance for a man in the 15th century to write chemical treatises on parchment. Certainly, if economy were any object, paper was easily procured. And, indeed, in Chapter III. of his earlier treatise On Natural and Supernatural Things, he himself affords the quite superfluous testimony that in his time paper mills abounded. It is always and everywhere recommended 'grobe Papier' for filters. Either, then, the talk about the necessity of abridging his book in order to economize parchment was inserted in order to impart a medieval taint, or else the Triumph-Wagen cannot possibly have been written later than 1460 or 1470.

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but as a production of the age of Galileo, Harvey, Gilbert and Kepler, it does not appear as a marvelous performance. The only circumstance at which one hesitates is that a scientific chemist, whose mind moved in the world of reality and veracity, should have mixed the description of his experiments with so much degraded bombast. We can only surmise that the wealthy Thöle, or the master spirit behind him, purchased these secrets of antimony from the alchemist, and worked himself into the otherwise nonsensical book in which they appear.

C. S. Pierce.

STUDIES FROM THE ZOOLOGICAL LABORATORY, HARVARD UNIVERSITY.

The following abstracts of papers prepared in the Zoological Laboratory of the Museum of Comparative Zoology at Harvard College have been made by the authors.

The final papers will be published as soon as the plates necessary for their illustration can be prepared. Other papers, not readily given in abstract, or requiring illustrations to make them intelligible in that form, will be published soon.

B. L. Mark.

Oogenesis in Diaptomus ocellatus Ritter. (C工作中al in other Forms. (Abstract.) By F. W. H. Abbot.

The material was obtained on the coast of California. In the compound ascidian Diaptomus, only, was it attempted to make the investigation at all complete. Here the development of the sexual organs, though in several respects simpler, conforms to the type described by Van Beneden et Julius in 1885. Both ovary and testis are derived from a common fundamental, which, on account of the differentiated oögonia it contains, is recognizable in even the smallest buds of the older colonies.

One of the diagnostic characters of the genus Diaptomus is the capacious broad

pouch in which the eggs are kept. It is attached to the body by a narrow stalk and has usually been described as a diverticulum of the peribranchial sac. The embryos are arranged so that the youngest are at the tip of the organ. It was found to be not a diverticulum but a pouch which is double, consisting of two narrow tubes, one of which is a continuation of the oviduct, while the other opens into the peribranchial sac. The oviduct tube opens into the bottom of the pouch, and it is on account of this arrangement that the younger embryos are always found in the tip of the organ. In passing from the ovary to the pouch the ovum is greatly compressed, assuming the shape of a sausage, but becomes oval as soon as it has entered the pouch.

The test cells are seen to be derived from the follicular epithelium, and not, as Davidoff has maintained in other cases, from within the ovum. The cytoplasm of the test cells has been stained from the earliest stages on, and strands of cytoplasm are seen during all the earlier stages connecting the test cells. The following phenomenon, somewhat the same way that Morgan has described: However, at this period, bends in the wall of the germinative vesicle and accompanying vacuoles in the cytoplasm are occasion- ally encountered, and it is likely that these appearances are what has been described by Davidoff as nuclear evaginations from which the test cells are formed. They are probably due to shrinkage. There are also deeply stained cells of the younger vesicle, which often have vacuoles around them, and then look exactly like Davidoff's figures of nuclear buds that have already become surrounded from the germinative vesicle. But they do not produce the test cells, as this author thinks. The test cells are found to take no part in the formation of the test of the embryo, as has recently been maintained by Salensky. The outermost