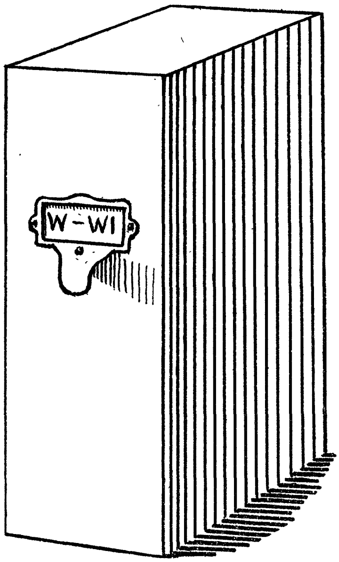
cles, it has come about that the larger part of a working scientific library is very apt to consist of separate pamphlets, which soon run up into the thousands in number. Many expedients have been suggested for arranging these so as to keep them always in strict order and at the same time readily accessible. The use both of drawers put in a cabinet, and of various forms of boxes, has been proposed from time to time, and each of these suggested plans has had something to recommend it.

I have now been using for some time a form of box which seems to me, on the whole to combine a larger number of advantages for the preservation and ready accessibility of one's pamphlets. This box is made of thin wood, and measures inside 7x4 inches, and is $10\frac{1}{2}$ inches in height. It is entirely



open at the back, and is covered with a cheap grade of marble paper. Pamphlet boxes of this form are furnished in quantity at low rates by the Library Bureau.* By simply adding to each of these a pull and label holder, as shown in the figure, we obtain a box which may be placed on a shelf of an ordinary book-case, and which may be easily pulled out from its position with one hand, leaving the other hand free to look over the pamphlets which it may contain. The label may be easily shifted in the holder, if the contents of the pamphlet-box are to be changed. These boxes may be arranged in rows upon a shelf, and then present a neat and orderly appearance, and whenever one box becomes too full another box may be interpolated in the series without difficulty.

As regards my own system, I arrange the boxes in two sets. In one of these sets the pamphlets are arranged alphabetically according to the author, and in this series I include all such publications as refer to my special line of study. In a second set each box is devoted to a special subject, and here are placed pamphlets which I have less frequent occasion to refer to. I find it also very convenient to keep journals and magazines in these boxes, a separate box for each magazine. These serials are then kept in good order, are protected from dust and are readily accessible.

In conclusion, I will only say that, after having experimented with many systems, I have found this the most simple, convenient and economical, and, therefore, on the whole, the most satisfactory of any which I have tried.

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NOTES ON INORGANIC CHEMISTRY.

THAT there is a decided resemblance between the compounds of oxygen and halogen salts with ammonia, and the compounds of these same salts with water was long ago pointed out by Professor H. Rose. This fact is further developed by Mendeleef in his 'Grundlagen der Chemie,' and attention is there called to the fact that many of these salts give up a part or the whole of their ammonia in a very similar way to that in which they give up their water of crystallization. A typical example is copper sulfate, which not only forms the compounds, $CuSO_4$, $5H_2O$ and $CuSO_4$, $5NH_3$, but also the four intermediate compounds, $CuSO_4$, $4H_2O$, NH_3; $CuSO_4$, $3H_2O$, $2NH_3$; $CuSO_4$, $2H_2O$, $3NH_3$ and $CuSO_4$, H_2O, $4NH_3$, so that the replacement of water by ammonia is not a mere figure of speech. In the last number of the *Zeitschrift für anorganische Chemie*, Fritz Reitzenstein takes up the replacement of water by other nitrogen bases, especially pyridin, and shows that a large number of salts form similar compounds with pyridin, as with water of crystallization. Some of these were known before, but twenty-eight new ones are described, as well as several compounds in which quinolin replaces the water of crystallization. A table is appended to his paper giving several hundred of the known hydrates, ammonia compounds and pyridin compounds in juxtaposition, and the resemblance of the typical members of each group is striking.

IN the previous number of the *Zeitschrift*, Reitzenstein's 'Habilitationschrift' is published, which is a very complete history of the different theories of the constitution of the metal-ammonia salts. The first notices of the combinations of certain salts with ammonia date back to Bergman and Tassaert in the last century, but no particular attention was attracted to them until the discovery of the first platinum-ammonia compound by Magnus in 1828. This was quickly followed by the preparation of new platinum bases by Gros (1838), Reiset (1840–1844), Peyrone (1844), Raewsky (1847) and Gerhardt (1850). As early as 1841 Berzelius attempted to explain their constitution according to his general theory of salts, but Claus was the first who held the view accepted to-day that the ammonia is present in the compound as the NH_3 group. This was brought into accord with the valence theory by Jörgensen, of Copenhagen, who has been the most prolific worker in the metal-ammonia compounds, and until recently his views, which represent the ammonia groups as united with each other, as $— NH_3 — NH_3 — NH_3 — NH_3 —$, has been generally accepted. Here the ammonia is often replaced by water, in which case the oxygen is looked upon as quadrivalent. In some series, as among the platinum and cobalt bases, isomers are met with, and some of them are difficult to account for by Jörgensen's theory. Within the present decade Alfred Werner, of Zurich, has proposed a new theory, which represents the atom of the metal as in the center of an octahedron, surrounded by six other atoms or groups (as NH_3 or H_2O), one at each angle. In some cases there are but four attached atoms or groups, in which case the configuration can be represented as on a plane with the metal atom in the center of a square and one group at each of the four angles. This complex is supposed to have a certain amount of combining power as a whole, and unites with negative or positive elements to form salts. Werner carries this theory out in application to many other classes of salts, as, for example, sulfuric acid, where the complex SO_4 is united with two atoms of hydrogen; potassium permanganate, where the complex MnO_4 is united to one atom of potassium; $(HgCl_4)K_2$, $(PtCl_6)K_2$, $(SiF_6)K_2$, etc. The idea of valence is not wholly abandoned, but is not adhered to in the formation of the complex. The theory is too new to prophesy whether it will meet with general acceptance, but in its application to the platinum and cobalt bases it explains much that is difficult to account for on the valence theory as ordinarily accepted. Reitzenstein's paper and recent papers by Werner should be consulted for the full explanation of the theory.

IN this connection it may be noted that the resemblance of water to ammonia is not confined to such cases as those mentioned. The production of liquid ammonia in quantity has led to its investigation as a solvent, in which it resembles water to some considerable degree. Salts render it a conductor of electricity and a similar dissociation seems to take place as in aqueous solution. In the December number of the *American Chemical Journal* E. C. Franklin and C. A. Kraus record the solubilities of something over five hundred substances, inorganic and organic, in liquid ammonia in which many analogies with water are shown. They also give the determinations of molecular rise in boiling-point of liquid ammonia for twenty-nine different substances.

J. L. H.

CURRENT NOTES ON METEOROLOGY.

UPSALA CLOUD OBSERVATIONS.

THE first publication embodying the results of the International Cloud Observations comes from Upsala, where Dr. Hildebrandsson carried on the work during the International Cloud Year (May 1, 1896–May 1, 1897). According to *Nature* (Dec. 1) nearly 3,000 measurements of heights and velocities were made, 1,635 of which were made by means of photography. The annual variation of the mean heights of the clouds is very marked, the maximum coming in June and July, and the minimum in the winter. During the summer the mean height of the cirrus is 8,176 meters, and of the cumulus 1,685 meters. The heights of the upper and middle level clouds are lower than at Blue Hill Observatory. The velocity of all the clouds is greater in winter than in summer.

RECENT ANEMOMETER STUDIES.

AT the meeting of the Royal Meteorological Society, held in London, November 16th, a report on the exposure of anemometers at different elevations was presented by the Wind Force Committee. The experiments were carried out by Dines and Wilson-Barker, on board H. M. S. *Worcester*, off Greenhithe. Five pressure-tube anemometers were employed, the first being at the mizzen royal masthead; the second and third at the ends of the mizzen topsail yard-arm, and the fourth and fifth on iron standards 15 feet above the bulwarks. The results show that the ship itself affected the indications of the lower anemometers, while some low hills and trees, which were a quarter of a mile away from the ship, to the south and southwest, also affected the wind velocity from those quarters. The Committee are of the opinion that the general facts deducible from these observations bearing on the situation of instruments for testing wind force are: (1) That they must have a fairly clear exposure to be of much value, and it would appear that for a mile, at least, all around them there should be no hills or anything higher than the position of the instruments. (2) That on a ship the results may be considered fairly accurately determined by having the instrument 50 feet above the hull, but that on land it will generally be necessary to carry the instrument somewhat higher, to be determined entirely by local conditions. (3) That no other form of anemometer offers such advantages as the pressure-tube, from the fact that it can be run up and secured easily at this height above a building, and that the pipes and stays can be so slight as to offer no resistance to the wind or cause any deflecting currents.

SAN FRANCISCO RAINFALL.

A PAPER by Marsden Manson in the October number of *Climate and Crops, California Section*, concerns the seasonal and monthly rainfall at San Francisco from 1849 to 1898. In this period of forty-nine years the normal annual rainfall has been 23.4 inches. Fluctuations have occurred between an annual rainfall of 7.4 inches in 1850–51, and