Irregular.

Irregular indicates that at times the bird may be Common and at other times Rare. Often this has to be used in connection with one of the other seven terms. In such cases it is often necessary to add Usually; as: Crossbill, Irregular, Usually Rare,

Of course it is not intended that these terms should always be used by themselves. One may use them, when necessary, in conjunction with other words; as, Common Migrant, Scarce Resident, etc.

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TRIVALENT PLATINUM

THE first evidences of the existence of compounds in which platinum acts with a valence of three were found about two years ago by Wöhler. On carefully chlorinating $PtCl_2$ or dechlorinating $PtCl_4$ at 390°, a greenish-black powder was formed which had the formula $PtCl_3$. This dissolved slightly in cold water, but more rapidly in hot, with the formation of an acid, H_2PtCl_3O, some hydrolysis also taking place. By precipitating with soda, a pure hydrated sesquioxid was obtained, but this could not be dehydrated without decomposition. When the hydrate was dissolved in acid a mixture of chloroplatinous and chloroplatinic acids was formed. Wöhler found, however, that when a dilute solution of cesium and a mixture of chloroplatinous and chlororin water, a dark-green powder is precipitated, of the composition Cs_2PtCl_5, which has a strong tendency to decompose into the chloroplatinite and chloroplatinate.

This work has been strikingly confirmed in a paper read by Levy before the Chemical Society (London) on March 25. Levy was working on the copper-red iridescent salt, discovered by Hadow, which is formed when chlorin or bromin is added to a solution of potassium cyanoplatinite. To this Hadow gave the composition of $5K_2Pt(CN)_4 \cdot K_2Pt(CN)_4 \cdot Br_2$. The character of the salt Levy confirmed, but its formula should be $6K_2Pt(CN)_4 \cdot K_2Pt(CN)_4 \cdot Br_2$. Levy also found that when the cyanoplatinite is oxidized by lead or manganese dioxid in the presence of sulfuric acid, a similar compound is formed, but containing SO_4 instead of Br_2, which behaves like the sulfate of a feebly electropositive element; in other words the group $(7K_2Pt(CN)_4)$ acts like a bivalent positive ion. More interesting was the result when hydrogen peroxid and other peroxids were used as the oxidizing agents. With the potassium cyanoplatinite there is at once formed a well-defined, crystallized double salt of the composition $3K_2Pt(CN)_4 \cdot KPt(CN)_4 \cdot 6H_2O$, which is not further acted on by hydrogen peroxid. When, however, perhydrol is used the oxidation to $KPt(CN)_4$ is complete, and a series of similar salts was prepared. With the free cyanoplatinous acid, $H_2Pt(CN)_4$, the oxidation to $HPt(CN)_4$ by hydrogen peroxid is complete. Here we have an acid and its salts in which the platinum acts, as in Wöhler's halid salts, as trivalent, and its formula may be written $HCN \cdot Pt(CN)_3$. These cyanoplatinates would bear the same relation to the cyanoplatinites as the ferrocyanids bear to the ferricyanids. This is unexpected, as it would naturally be inferred that in accordance with the analogy furnished by the haloplatinites and haloplatinates, the cyanoplatinates would have the formula $M_2Pt(CN)_6$. No evidence was found of similar compounds of the type $2MCN \cdot Pt(CN)_3$ or $3MCN \cdot Pt(CN)_3$. On treatment with KCN or with any alkali, decomposition ensued, with the regeneration of the cyanoplatinite.

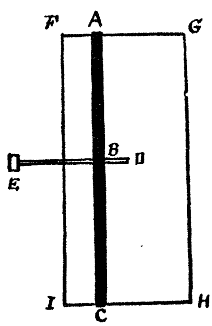
J. L. H.

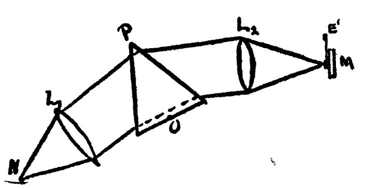
SPECIAL ARTICLES

SIMPLE DEMONSTRATION APPARATUS FOR THE INFRA-RED SPECTRUM

MOST teachers of experimental physics in this country do not attempt to illustrate the optical properties of matter in the long wavelength invisible spectrum, for the reason that the standard detecting instruments, the bolometer, thermopile, radiometer or radiomicrometer, are not particularly well suited for use in the lecture room where great stability is not usually ensured. Moreover, unless the lecturer in general physics happens to have had considerable experience in the use of these instruments they are likely to cause annoying delays in the generally hurried preparation for an experimental lecture.

For demonstrative purposes the simpler an instrument is the better, provided it may be made sufficiently sensitive, because in an elementary lecture course there is danger of the student losing sight of the very phenomenon which an instrument is designed to render apparent if his attention is divided between the instrument and the phenomenon. I have recently devised a substitute for the





bolometer or other detecting instrument which meets the requirement of simplicity in an eminent degree, as it consists only of an india-rubber band, a glass fiber, a small mirror and a small piece of plate glass. It may be put together and adjusted in less than a minute and may be mounted anywhere on the lecture table, as it does not require a very stable support.

It is well known that the elasticity of stretched india-rubber increases with increasing temperature so that on heating the stretched piece it shortens. An india-rubber band about one millimeter wide is stretched to nearly double its length about the rectangular frame of plate glass *FGHI* and a glass staff *DE* (which should be as straight as possible and of a diameter such that it is just stiff enough to support the small mirror *E* of silvered microscope cover-glass of about two or three square millimeters area) is placed, as shown in the figure, under the rubber band at its middle point *B*. If the portion *AB* be heated the staff *DE* will roll on the frame towards the edge *FG*, and a beam of light reflected from the mirror *E* may be used to indicate (and magnify) this contraction of the india-rubber band. A change of temperature of both portions of the band, *AB* and *BC*, will be without effect on the position of the mirror *E*. This ensures steadiness of "zero." The inertia of the moving parts is small and the change in elasticity of the rubber follows the changes of temperature without any very noticeable lag, so that the instrument is both "dead beat" and sufficiently quick to respond to *differences* in temperature between the sections *AB* and *BC*, and insensitive to changes in temperature which affect *both* of the sections.

For use as a substitute for the bolometer it is sufficient to clamp the rectangle *FGHI* in a vertical plane and to cause the spectrum to pass across the portion *AB*—the rise in temperature of the strip *AB* is approximately proportional to the energy present in the portion of the spectrum which covers *AB* and, the change in elasticity being approximately proportional to the change in temperature, the deviation in the beam of light from the mirror is approximately proportional to the energy present in the particular part of the spectrum which covers the strip.

For demonstration in the spectral region between the red and wave-length $\lambda = 3\mu$ where glass begins to be opaque the arrangement shown in the figure is convenient—*N* is a Nernst filament mounted in a vertical plane V — h_1 and h_2 large short-focus glass lenses and

P a large glass prism (a 60° prism 3 inches high and 4 inches on the slant face works well, though one half this size would do, particularly if very short-focus lenses were used). M is the plate glass rectangle $FGHI$ mounted vertically at the principal focus of the lens h_2 so that the colored images of the Nernst filament are parallel to the band AB.

It is well to mount the prism so that it may be gradually rotated about the vertical axis through O. If large lenses and a large prism are available it is well to use the long 220-volt Nernst filament and to choose the rubber band so that the length AB is about equal to the length of the Nernst glower used.

As the prism is rotated and the spectrum moves across the band the deviation of the beam of light from the mirror E increases and reaches a maximum and it is easy for the audience to see that this maximum is reached when no visible light is falling on the band AB.

By setting the prism so that the red of the spectrum falls on the band, and noting the change in the deviation of the beam of light from the mirror E as various substances are placed in front of the Nernst glower, and then noting the changes produced by the same substances when they are introduced under the condition that invisible long wave-length energy falls on the band, it can be readily shown that not all substances which are transparent are diathermanous.

AUGUSTUS TROWBRIDGE
PRINCETON UNIVERSITY

THE AMERICAN SOCIETY OF ZOOLOGISTS

THE Central Branch of the American Society of Zoologists met at the University of Illinois, Urbana, Ill., April 5 and 6, 1912.

The following officers of this branch were elected for the ensuing year:

President—H. B. Ward, University of Illinois, Urbana, Ill.

Vice-president—C. M. Child, University of Chicago, Chicago, Ill.

Secretary-treasurer—W. C. Curtis, University of Missouri, Columbia, Mo.

Additional Members of the Executive Committee—C. E. McClung, University of Kansas, Lawrence, Kans. (for three years); H. F. Nachtrieb, University of Minnesota, Minneapolis, Minn. (for two years).

At the business meetings, on April 5, action was taken as follows:

Resolutions upon the death of Professor C. O. Whitman as spread upon the minutes of the society were read.

By vote of the society the committee on the form of presenting papers for publication, Dr. C. E. McClung, chairman, was continued. No report was made.

The following report of the committee on nomenclature, Professor C. C. Nutting, chairman, was read and unanimously adopted:

The Committee on Nomenclature appointed at the Iowa City meeting of the Central Branch of the American Society of Zoologists reported last year a plan whereby various zoological organizations in America might unite in an effort to influence the International Commission on Nomenclature in the direction of securing greater flexibility in the interpretation of the rules. The committee begs to report that after extended correspondence it has reached the unanimous conclusion that it is impossible to secure any modification of the present practise through the International Commission itself, and that the officers of that commission maintain that its hands have been tied through action recently taken by the International Congress. It appears consequently that recourse to the International Congress itself offers the only remedy for the adjustment of the difficulties. That these are increasingly apparent becomes evident by the protests and appeals which are finding expression in various form from individuals, from groups of workers and from societies not only in this country, but in various other parts of the world, as a result of which several propositions have already been formulated for presentation to the meeting of the International Congress at Monaco in August, 1913.

The Committee on Nomenclature reports to the American Society of Zoologists, Central Branch, requesting at this time:

1. Authority to ask from the membership of the Central Branch an expression of opinion on the following question: Do you favor the strict (inflexible) application of the priority rule as the latter is now interpreted by the International Commission on Nomenclature?

2. The adoption of the following resolution for transmission to the International Zoological Con-