

be abolished, no matter if the most exquisite birds become extinct.

It is known that many trades have suffered severely from the advent of the motor-car. Whip-makers have scarcely anything to do. Harness-makers have also suffered, yet these trades could scarcely demand that motors should not be used because such might suffer thereby. And as the world becomes more thoughtful and humane, surely if birds are to be safe the plumassiers must go to the wall, and no great harm. There are other callings in which they must by degrees embark.

It is very strange that men do not more definitely show how very much they dislike seeing ospreys and humming-birds in women's hair or headgear. Men who are most feeling and know all about it, and keenly detest the cruelty that these ornaments involve, will sit by women at dinners and operas and not show in the slightest degree what they feel about these barbarous ornaments. After all, women only adorn themselves to please men, and if these had the courage to show how intensely they disliked, and were distressed, by these things, they would decidedly not be worn. To their intimates they could say, "How much more charming you would look with anything on your head or hat than that."

Of course, there is no denying the fact that woman is the sinner, and it seems very sad and shocking that all the trouble and misery brought upon birds with beautiful plumage is owing to the ignorance or cruelty of woman—*cherchez la femme*. Yes, alas woman—and woman alone—is the sinner. She will not listen to the voice of her sisters who *do* know, and who so gladly would, and could, put her in the right way of looking at the matter. As she adorns herself chiefly to please men, well, let them educate her, with scorn and strong words if her vanity or stupidity leave her cold to information kindly given.

There is no supply without demand. This holds good of every commodity; and let the demand once cease, and all the endeavours of the kind-hearted lovers of the beautiful to preserve birds now so ruthlessly destroyed for no purpose but the adornment of vain and stupid women will be needless.

There is such an abundance of lovely ornaments to be had. Natural or artificial flowers, exquisite ribbons, laces, &c., and if there must be feathers, then take some which require no cruelty to procure, and which the deft fingers of most clever workers can dye and trim into things of weird beauty, almost as pretty as the real thing, for glint and twist can be added to ducks' and fowls' feathers enough to satisfy a savage. These would not only save the birds, but their feathers, being no longer required, would come into ever-increasing demand, and give work to thousands of women who are always complaining that there is nothing much left for them to do. This makes so many of them force themselves into positions which males could occupy. Every woman who takes a position a man could fill prevents one man marrying. This is an aspect of the case seldom considered by women, and would be well for them to ponder on. One is glad of *any* argument to induce women to think and to act in such a way that the horrible cruelties associated with their feathered heads may in time be a thing of the past. There is no doubt if they *knew* the shocking cruelties perpetrated to obtain such an unsuitable adornment to any kind-hearted woman's head, they would certainly not wish the *real* ospreys and humming-birds' feathers to be procured for them.

Of course, imitation feathers would be cheap—to some women an unpardonable fault. Well, when the adornment *must* be expensive, there are jewels and laces.

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NO. 2312, VOL. 92]

Specific Heats and the Periodic Law—An Analogy from Sound.

I AM much interested in Dr. H. Lewkowitsch's letter on specific heats and the periodic law, which appeared in NATURE of February 12. His suggestion, based on Guldberg and Wage's "mass law," of a reconciliation between Sir James Dewar's recent low-temperature experiments and Dulong and Petit's earlier experiments on specific heats, seems to me most valuable.

I am well aware that analogies are apt to be dangerous, especially when pushed very far. Nevertheless, I am proposing to put forward the analogy from acoustics which may interest some of your readers.

The experiments on which my analogy depends are performed on an ordinary pianoforte, and as they may be repeated by anyone, I will state the directions thus:—Very gently strike a high note (say C in alt) with "loud" pedal down and the finger soon removed; change to soft pedal and notice how long the note is audible as you sit at the piano. Repeat in all particulars with a lower note (say C, two or three octaves below). It will be found that the lower note persists very much longer than does the higher note. Next repeat everything in the same way, but strike powerfully instead of gently. Notice the time during which each loud note remains loud (or audible to a friend in the next room). It will be found that there is very little difference in the duration of the two loud notes.

I think the analogy to be deduced is fairly obvious, but I will state it nevertheless.

Very soft notes arise from wires when vibrating with small amplitudes; these wires correspond to atoms at very low temperatures, for atoms under such conditions vibrate also with small amplitudes.

On the piano a definite amount of damping (produced by pedal action) curtails the amplitudes of the compared vibrating wires in a ratio which approximately is *inversely proportional* to their respective masses—*i.e.* equal damping (equal resistance to motion) has the *smaller* effect on the *more* massive wire. The results of Sir James Dewar's experiments at low temperatures are echoed *pianissimo* by these vibrating wires.

Louder notes correspond to higher temperatures; the amplitudes both of wires and of atoms are wider. In these circumstances of higher excitement, it is found on the piano that about the same amount of energy is wanted to reduce equally the loudness of light and heavy wires, while in the calorimeter it was shown by Dulong and Petit that about the same amount of energy is degraded in reducing equally the temperatures of light and heavy atoms.

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X-Rays and Metallic Crystals.

IN NATURE (August 14, 1913), and later in the *Philosophical Magazine* (October, 1913), Keene gave an account of some interesting experiments on the transmission of X-rays through rolled metal sheets. In connection with his investigation it may be of interest to record some results we have obtained in recent work on metallic crystals.

Some preliminary experiments were carried out with annealed specimens. A lump of copper, for instance, was cut in two, and one of the pieces heated up to a high temperature and then allowed to cool gradually, whilst the other piece was left untreated. Beams of X-rays were allowed to fall at almost grazing incidence on the two newly cut surfaces, and the reflected