THE SILVER QUESTION AND BIMETALISM.

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I DO not think any apology is needed in introducing the silver question as a scientific one, as no subject can have a deeper interest for the American scientist at the present time, than a consideration which can furnish one particle of elucidation to this most interesting and complicated question.

In order to arrive at anything like a fair solution (and that is the only one the world which is both our debtor and creditor will listen to) we must divest it of all local and national considerations, because the fact of nearly all the silver in use being the product of America, a certain amount of prejudice against American opinions and actions is engendered thereby.

We find it stated (Wealth of Nations Vol. 1,743. M'Culloch's ed.)"Every prudent man, in every period of society, after the establishment of the division of labor, must naturally have endeavoured to manage his affairs in such a manner as to have at all times by him, besides the peculiar product of his own industry, a certain quantity of some one commodity or another, such as he imagined few people would be likely to refuse in exchange for the produce of their industry."

The question is, do we find in silver such a commodity? Do our creditors all over the world exhibit a willingness to accept payment for our debts in silver? The answer is obviously "no."

In the event of our succeeding in enforcing such payment as a legal tender, it is certain that those who did so would buy upon worse terms than those who paid in gold, a metal which all the commercial world is craving for.

Now is this craving merely sentimental, or is there good ground for its existence?

One thing is certain that large and important countries one after another are abandoning the double standard, and silver is the one sacrificed, the reason for which is not far to seek.

In order to successively maintain a double standard, we must be able to fix an unfailing ratio of value between the two metals, let us see if that is possible between gold and silver.

We find that in the time of Julius Caesar the ratio of value between the two metals was 9 to 1; in the beginning of the present century 15½ to 1, and now 27½ to 1, which seems to point to an impossibility of establishing a ratio of value, it is obvious that to measure length a standard must have fixed length, to measure value it must have fixed value, attempts have been made by powerful syndicates to give an enhanced value to copper, iron, tin, cotton, corn, etc., all of which have ultimately broken down.

Suppose for a moment the government of the great commercial countries of the world were to establish a bimetallic standard and accept silver as one of them. In order to be of any value to the silver interest, silver must be a legal tender to any amount.

From its depreciating tendency it would soon become the one medium of exchange, and gold would assuredly be hoarded, which would prove most inconvenient, for in the event of your presenting say a cheque of $5000 for payment the banker, whoever he may be, would insist upon the customer taking silver because it paid him (the banker) best to do so, and it is difficult to realise the position of the customer under such circumstances, whilst the trouble and difficulty of international exchange would be greatly enhanced.

I propose in a later article to introduce the subject of an international clearing house, the relief of which to the metallic exchange can only be appreciated by those who have a thorough knowledge of the advantages of the London clearing house, where the bulk of the trade of the United Kingdom is settled for, upwards of twenty millions sterling per day, without the interchange of a single coin.

These two subjects are so interwoven that one cannot be fairly or properly considered without the other, but this article has already run out its proper length for your columns so that I dare not do more than hint at the subject of an "International Clearing House."

I may just say in conclusion that in my opinion the "letter" of Mr. Farley who was elected President of the National Board of Trade at Washington last January, and which may be read in the official report of the proceedings of that meeting, whilst it contains many valuable suggestions upon the silver question, would be found as a whole to be thoroughly unworkable.

FAITH IN THE INTEGRITY OF THE INTERSTELLAR MEDIUM.

BY DE VOLSON WOOD, HOBOKEN, N. J.

THAT space is not void, is conceded. That it is filled with a medium capable of transmitting light and heat is not questioned. This medium is believed to be uniform in density and elasticity, but the exact nature of its constitution is unknown. Some believe it to be molecular like gas, while others question if its structure has been correctly defined. It makes no direct impression upon the senses, and is known only through effects produced; and yet, whatever be its nature, it is known to transmit a wave of light at the rate of 86,300 miles per second, there being, as a mean value, within the spectrum, about 50,000 waves in an inch, or more than 60,000,000,000,000,000 in the distance passed over in one second. When it is considered that waves are transmitted through this medium in all conceivable directions with the same velocity, some faint conception may be had of its intense activity. The complicity of the waves is transcendent, for each shade of light has its own wave length, there being about 36,000 waves to the inch in red light, and more than 64,000 in violet, and outside the visible spectrum there are less in number in one direction and more in the other. Every self-luminuous body in the universe is imparting to this medium waves of these varying lengths all travelling with a sensibly constant velocity. When it is considered that the countless number of stars and suns, scattered promiscuously throughout limitless space, are producing such waves, radiating from each in all possible directions, it would seem that, if they did not actually destroy each other they would so interfere as to produce "confusion worse confounded" and the impressions upon the eye of an observer would be valuless. But, on the contrary, the scientist believes that this medium truly and faithfully transmits to the remotest space every wave imparted to it, preserving with the strictest integrity its individuality —except that planets and other solid bodies may destroy the waves they intercept.

A star ten or more years ago started a wave which just now, we will suppose, arrives at the earth and writes its own record on some sensitized plates, though the star may be 6,000,000,000,000 miles away. From these impressions the physicist finds—perhaps—that the star is double, although the most powerful telescope had failed to divide it, that the two revolve about each other, and he determines there probable orbit, masses and velocities. Or, perhaps he finds, as in the remarkable star of 1892, that it changes from a star to a nebula in a few months. In all this, no question is raised in regard to the integrity of the record, nor whether in its long journey any planet, sun, comet, meteorite or nebula has interfered to modify

or in any way corrupt the story it was commissioned to tell. What faith! But this is little more than the shadow of an illustration; for Herschell, the astronomer, thought it probable that we can see nebulæ from which it has taken light 300 000 years to reach the earth, during which time the interstellar medium has been faithful in transmitting at the rate of more than 11,000,000 miles per minute the impulse committed to it, notwithstanding its path has been crossed and recrossed by other waves without number. Pen cannot adequately describe the transcendant properties of this wonderful medium called the "lumineferous æther" nor to highly exalt that faith which enables one to implicitly believe the truthfulness of the stories committed to him. One is led to exclaim with the Psalmist "Oh Lord! how manifold are thy works, in wisdom thou hast made them all."

CITY BIRDS OF DENVER, COLORADO.

BY HORACE G. SMITH, DENVER, COLO.

PERHAPS some of your readers would like to know something of the city birds which come about our dwellings in Denver, Colorado, and wherein they differ from the familiar species so near to the hearts of the bird lovers who live east of the Mississippi River.

To be sure, many of the Eastern species, whose geographical range is so extensive find their way, across the Great Plains, to our city at the base of the Rocky Mountains, still true to the type of their eastern friends, but for the most part the species undergo a radical change when we enter the high and arid regions of the Great Plains and become of a bleached and faded appearance which gives rise to subspecies or varieties; or, as is often the case, a new species takes the place of its eastern relative.

Among those species which we have in common, the Yellow warbler (*Dendroica aestiva*) is perhaps one of the most familiar summer residents, and its neat little nest is often built in the shade trees along our streets or in the shrubbery of some garden, and its familiar song is heard even in the heat of midday, when most birds are silent.

Scarcely less noticeable is the Kingbird or Bee Martin (*Tyrannus tyrannus,*) the Cliff swallow and the Barn swallow, whose habits are well known to most readers and may not be detailed here, though I may mention that a pair of Barn swallows has returned to the writer's barn-loft for about fifteen successive years, and when unmolested has reared two broods per season. Their mode of entrance was through an open window, which they usually found shut upon their return migration in the spring, but would soon make their presence known by repeated scoldings and flutterings before the glass and would enter and take possession as soon as the window was opened. Hence I suppose it to be the same pair, though the evidence is not conclusive.

Perhaps the most conspicuous of our summer birds is Bullock's oriole, which takes the place of the Baltimore oriole of the east. This brilliant bird is a common breeder over the entire city, wherever trees are found in which to built its swaying nest, and it is not an uncommon occurrence to find several nests—which have been built in successive years—in the same tree.

I have often watched these birds in the early morning, searching for insects in the arc light globes; their method being to enter the globe for any tempting morsel and then flying to the next in line.

Speaking of the electric lights reminds me of the little House finch (*Carpodacums in frontalis*) whose song often cheers us in the winter time, when most birds are silent. It would be hard to part with this little bird, for his song is rich and pleasing. Being a resident with us, they rear their young near to our homes, usually in trees or crevices of buildings, but being progressive they have lengthened their breeding season by taking advantage of the heat furnished by the electric lights, by building their nests in the lamp shades above the lights, thus being entirely protected from the weather.

The past summer I was told by one of the trimmers that nearly every light on his beat contained one of these nests.

Among other summer residents, more or less common I may mention the Western robin, Mountain bluebird, Warbling vireo, White-rumped shrike, Lazuli bunting, Black-headed groobeak, Western chipping sparrow, Arkansas goldfinch, western meadow lark, Say's phoebe, western wood pewee, Mocking bird and western Kingbird, the latter being a cousin of the Bee martin and having all the habits of his querulous relative.

The Pine siskin (*Spinus pinus*), though considered a migrant with us, occasionally rears its young here; a pair having built their nest in an evergreen in the writer's yard. This is not so surprising when we consider that its natural summer home among the coniferous forests may be found within fifteen miles of Denver, in the mountains.

Parkman's House wren (*Troglodytes ædon parkmanii*) seems less familiar than the eastern bird, at least in the manner of its nesting, for, though not uncommon in our city in migration, it seems to retire to the thickets along our streams to build its nest; usually taking possession of some crevice or deserted woodpecker's hole.

A few winter birds remain with us but perhaps none so common or well distributed as the House finch before mentioned. The western Tree sparrow, Mountain chickadee, Long tailed chickadee, McCown's longspur, Cassin's finch, Harris's and Batchelder's woodpeckers, the Northern shrike and several varieties of Juncos or snowbirds, though the Desert horned lark (*Otocoris a. arenicola*) is the familiar "snowbird" of the region and is often seen in numbers in the outside streets, especially when snow is on the ground.

At other times it is not often noticed though it may be present, for its plumage harmonizes well with its surroundings. Besides these we have an occasional visit from the snowflakes, Red polls and some others.

I make no mention of the host of migrants, which fill our city during the migrations, including rare and curious species of warblers, sparrows, thrushes, flycatchers etc., nor of other summer residents of the region, whose summer haunts are found in woodlands or upon the plains, for this is essentially a paper upon "city" birds. These may receive our attention at some future time.

OVERHEAD SOUNDS IN THE VICINITY OF YELLOWSTONE LAKE.

BY EDWIN LINTON, WASHINGTON, PA.

WHILE engaged in making certain investigations for the United States Fish Commission in the summer of 1890 my attention was called to an interesting phenomenon in the vicinity of Yellowstone Lake, of which I am pleasantly reminded by the following brief but vivid description in a recent report by Prof. S. A. Forbes.

Under his description of Shohone Lake, Professor Forbes, in a foot note, thus alludes to this phenomenon:

"Here we first heard, while out on the lake in the bright still morning, the mysterious aërial sound for which this region is noted. It put me in mind of the vibrating clang of a harp lightly and rapidly touched high up above the tree tops, or the sound of many telegraph wires swinging regularly and rapidly in the wind, or, more rarely, of faintly heard voices answering each other overhead. It begins softly in the remote distance, draws rapidly near with louder and louder throbs of sound, and dies away in