



THE MASSES OF BODIES

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If one were to ask the average High School student who has had some physics what is meant by the mass of a body he would probably be told that it is a measure of the quantity of matter in the body, or a measure of the body's inertia...

Determination of Weight - Everyone is familiar with the fact that some bodies are easier to start or stop than others, and this regardless of friction...

Having agreed on a method of classifying the bodies it is our next problem to have a means of placing each body in its proper place in the classification, that is, of measuring its mass...

Planets and Stars - The masses of the other planets of the solar system (which have satellites) are obtained by the harmonic law. When two bodies revolve about each other the harmonic law gives a relation connecting their distance apart, their period of revolution and their combined mass...

Effect of Gravitation - We have referred to the two chief methods of "weighing" terrestrial bodies. We shall now consider the problem of finding the masses of celestial bodies. Consider first the earth itself. One of the best methods was that devised by Michell and employed by Cavendish in 1798.

weight of the small ball is the ratio of the mass of the large ball to the mass of the earth, and so the mass of the earth can be obtained. A second method is the mountain method. The principle here used is that the mountain will, by gravitational attraction, deflect a plumb-bob from the position it would occupy if the mountain were not there.

Sun, Moon and Earth - The mass of the sun is obtained by the motion of the earth on its orbit. A change in the direction of motion is just as much acceleration as a change in speed, and the earth changes its direction along its orbit due to the attraction of the sun.

The moon's mass is obtainable by observing the displacement of the sun in the ecliptic. A new principle of mass determination is here involved. Everyone has observed that to swing a stone on the end of a string an inward force is required and that the force is greater for the same mass the longer the string, provided the ratio of revolution remains the same.

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When we come to a consideration of the stars the problem is more difficult, but it has been solved in certain cases. A large number of stars are binaries or doubles. That is, many stars which appear to the eye to be single, when viewed in a telescope appear double.

But while some stars are double to the eye there are others which appear single, but which are actually double as shown by the spectroscopic. They are accordingly called spectroscopic binaries. The spectroscopic gives the velocity of the star towards or away from the sun, and when this velocity varies regularly and periodically it is because the star is revolving in an orbit.

mination of stars has been developed by Professor A. S. Eddington, based on theoretical considerations as regards radiation. For its application the distance of the star must be known. It has shown satisfactory agreement when applied to the stars whose masses were already determined...

The Odes of Horace

A Translation

A NOTABLE contribution to the modern adaptations of classical literature has come from the pen of Mr. John Finlayson in his translation of the Odes of Horace into English verse.

The Odes of Horace, as much as any other classical production, have kept alive the love of Grecian mythology. The lustre of his genius has not been dimmed by succeeding ages, but has shone with the same steady effulgence. Mr. Finlayson set out to give a happy translation and to emphasize, in the beauty of the English language, the conception of a great Roman of what lay at the root of Greek philosophy and poetry.

"He drank from wells of Grecian lore, And made his own its classic grace; True art was eager to adore, Gave counterfeit no place."

"The schoolman, statesman, king and sage, The soldier in the tented field, Have owned the glamor of his page, All ranks their homage yield."

"Seductive bard whoever may climb Parnassus hill and snatch a crown, Thou wilt but mellow to thy prime Till all of Time hath flown."

The following appreciation of Mr. Finlayson's translation has been written by Mr. Alexander Smith, principal of the Sproule-School in this city and a classical student of considerable attainments:

"All interested in the survival of Classical Literature will confess a debt of gratitude to Mr. John Finlayson, who has lately brought out a versified translation of the Odes of Horace. Only those familiar with the works of the great Augustan poet in the original will realize the greatness of the undertaking.

"Mr. Finlayson has brought to his work and has preserved to a high degree the spirit of the original. In these days of materialism the Classics are passing through a critical stage, and the work of Mr. Finlayson will do much to keep alive that love of Roman life and literature which has had such an important influence on the development of the British Empire."

The march of the human mind is slow—Edmund Burke.



(BY RICHARD L. POCKOCK)

Do you remember, Dick, the other day you told us there was a big Spring salmon came near Cowichan Bay. I think you said it was, and you said maybe you'd tell us all about it some time.

"Of course, you know that the very best time for fishing for these big Springs in the Summer and early Fall is so dashed early in the morning that, if you're a bit particular about your breakfast and your beauty sleep, you don't always get there in time, but then again, there's always a chance of getting hooked up with one late in the evening again, though in my experience there ain't often very much doing in the middle of the day, not as a general rule, that is."

"Well, I'd gone up to the bay by the afternoon train, and after getting outside a bit of dinner, thought I'd have a try overnight anyhow to see if there was anything doing, though I didn't much expect to catch anything bigger than grilse until the next morning. I rigged up the rod and put on my old favorite, a small-sized spoon which I have found catches the big 'uns and the little 'uns, too, when they're in the mood, and nothing 'll catch 'em when they ain't, and I started to row to the piles across the end of the flats. I'd hardly got started, and was still letting out line by degrees; you know, letting out a few yards and then rowing hard to keep it off the bottom and then letting out a bit more. I suppose I'd got out about fifty feet or so and had put the rod down in the stern and just grabbed the sculls again, given about two or three strokes, when, just as I turned my head to get my course, I heard a rattle and a whizz, and I made a grab for the rod just too late. Over it went and splash into the water behind the boat. Now, it wasn't the bottom or a weed; it was sure enough a big fish; you'd have had no doubt about that if you'd seen the thing happen. That old fish didn't jump, but he made a regular wave as he came near the surface trying to race away from that spoon that bit him, and the rest, as the novelist says, was silence, for a while, until I broke it, never mind how."

Out of Business - "Well, there I was up for a week-end's fishing for Springs and the whole works gone overboard right before I had got properly started. Of course, I'd got some spare spoons and odds and ends in the old tobacco box in my pocket, but I hadn't brought another rod or reel or line, and I was strictly up against it. "What did I do? Why, darned if I didn't drag for it. The water wasn't very deep just there, and I took marks and then beat it for shore and rigged up a heavy line and sinker and a regular dragging outfit in the hope that the old fish had got disconnected before he had been able to take my tackle very far, but it was a forlorn hope, and I never got it back."

"I just had to make the best of it. I tried to borrow some tackle from the hotel, but the best I could raise was a heavy handline, and there ain't much sport in catching salmon that way. However, I got a little of my own back in the morning. I was up before it was light, and I landed three good big Spring salmon on that handline just by way of revenge."

"Tell you another annoying thing about that occurrence, Harry. I happened to be using a high-grade reel that I had spent more than I could afford on, and the thing was made of aluminum. It was a beautiful piece of goods, but there was just one drawback to it. That was that when used for fishing in the sea or in water that was at all brackish the aluminum corroded and the body of the reel was gradually sort of decaying slowly in consequence. Now I wanted to call the attention of the makers to this little drawback to aluminum for reels used for salt water fishing, and had intended to send the reel back to them to prove my contention that it was not a suitable metal for the purpose, but how could I when that beastly fish had destroyed all my evidence? However, I'm a pig-headed sort of cuss, and I had to have my little argument anyhow, so I wrote and told them all about it, and even explained that I couldn't send them the reel to see because a big fish had dragged it overboard."

Sympathetic Understanding - "Those chaps were good sportsmen. They never even hinted that I was telling them a 'fish story' in the general use of the term. They took my word for it absolutely, more power to 'em, and they gave me a hint which I'll pass along to you, and you can tell your friends or such of them as have aluminum reels. They told me, if I oiled the reel all over with sweet oil before going out fishing and wiped it well every time I came back that they thought the salt water or the salt air would do it no harm. Maybe they're right; I haven't tried, because I got them to make me a reel of the same pattern out of gunmetal, and that seems to stand anything. It's heavier, of course, but I don't think that a

drawback; it balances the rod better and it's still going strong after a good many years' use.

"Yes, that old fish sure put one over me that time. I ought to have known better, too, as that was the second time in my experience that I had lost a rod and tackle in practically the same way, though the other time it was in a swift river current just where the river entered the sea, and it was a bit tight on that occasion that put a temporary stop to my campaign against his tribe. Still that time it wasn't so bad, because it happened just at the end of a trip instead of just at the beginning, and in that case it was the fish that was taking revenge for the death of a good many of his brothers, mostly big brothers, too, while in the case I've just told you about I had to take my revenge on that salmon's brethren with a borrowed handline. Could anything be much more humiliating to a man who was out for sport and not just for fish?"

Old Dick Moralizes - "When I come to think about it, this mania a man has for fishing sometimes brings him into some queer kinds of trouble, worse sometimes than just losing a little tackle. There's more than one good chap lost even his life through his anxiety to catch fish, specially in swift water, capped or waded just a little too far or too carelessly; dangerous things waders if you start taking chances of that sort. I had my lesson in not taking chances with waders on one day up in the Cowichan River; came darned near drowning myself and did down a first-class watch, but lumme boys, what sport is there that's worth anything that a man won't take a chance for some time or other? I guess it's human nature, and we never seem to learn from other people's experience and not always from our own."

Makers of Empire

Home of Royal Geographical Society No. V.

THE exploits of some Makers of Empire cost a great deal of money and were largely financed from Government sources, but without regular organization. Toward the close of the eighteenth century a few English admirals banded themselves together and formed the African Association. Their funds were limited, but their hearts were staunch and they had determined to learn something about the interior of Africa.

A number of these men formed the Raleigh Dining Club, which held periodic dinners in a famous roadhouse of bygone London. Distinguished travelers were invited to speak on their wanderings and observations, and by 1830 the club had become one of the outstanding features of business society. On the 24th of May of that year, at a very largely attended meeting, with Sir John Barrow in the chair, it was decided to elevate the club into a Geographical Society for the purpose of promoting and diffusing geographical knowledge.

Twenty-five years later the Society became interested in a young missionary who had returned from Africa. His name was David Livingstone, and he decided to raise funds to send him out in 1865. They also helped to finance the expedition for his relief in 1872. They contributed a large sum to aid Captain Scott on his first Antarctic expedition, and assisted Sir Ernest Shackleton when he made his journey to the South Magnetic Pole in 1909.

Building Acquired - In 1859 a Royal Charter was granted by Queen Victoria and annual grants made in return of certain public privileges. Until 1911 the Society had no home of its own, but was operating in leased and rented premises. In 1911 the home of the Right Hon. James Lowther, M.P., Speaker of the House of Commons, was purchased and the valuable equipment moved to Kensington Gore. Here for the first time the relics of British arid and expansion could be displayed. A wonderful museum was formed with the rare maps, pictures and valuables set forth to public view. The map room, which is open to the public, is a model of efficiency. Near the doorway an illuminated stand displays new lantern slides which have been prepared by members, and which are used in lectures.

The lecture room is intended to seat only members and their immediate friends, but from time to time public meetings are held in the great Albert Hall, which is not far away. The Society has probably the finest home and library of any learned organization in the world. At the present time there are six thousand members, and much attention is being directed to the plans of the President, Sir Francis Younghusband, to gain the heights of Mount Everest, in Tibet.

The caves of Kirkdale, England, have great quantities of the bones of the elephant, hyena and rhinoceros.