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A JAPANESE FAIRY TALE ABOUT THE HYDROGEN ATOM

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Announcement. The information published by ITAR-TASS being available on the Internet concerning the fact that the Japanese scientists,

http://www.glubinnaya.info/modules.php?name=News&file=article&sid=994

were able to capture an image of a hydrogen atom is a recurrent Japanese fairy tale for those people who do not have new knowledge concerning the microworld.

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Microworld: The Japanese scientists were able to capture an image of a hydrogen atom. For the first time in history, the team of the specialists of the University of Tokyo was able to capture an image of a separate hydrogen atom, the smallest and lightest one of all the atoms. Headed by Professor Yuichi Ikuhara, the investigators informed that they used a state-of-the-art scanning transmission electron microscope for this purpose.

A hydrogen atom has a diameter of about one-10 millionth of a millimetre. It was supposed earlier that it was next to impossible to take its photo with the use of modern equipment. According to ITAR-TASS, hydrogen is 90% of all atoms in the Universe.

Together with the hydrogen atom, the Japanese scientists captured an image of a separate vanadium atom. It is possible to catch images of other elementary particles in the same way. "Now we can see all the atoms, which compose our world, - says Professor Ikuhara. - It is a breach to the new forms of production when it is possible to adopt decisions at the level of separate atoms and molecules in the future".

Dear Professor Yuichi Ikuhara,

I recollect the first Japanese sensation concerning the creation of an electron microscope with a resolution of 1 Angstrom unit $(10^{-10} m)$, which took place at the beginning of seventies of the last century. At that time, I was greatly impressed by the achievement of your scientists. Why did they fail to take the photo of a hydrogen atom, which size is near to one Angstrom unit in an unexcited state? Certainly, you have no answer to this question, because it is impossible to get it on the basis of old scientific knowledge, which you have. Please, allow me to answer instead of you.

Prior to analyzing the image of the hydrogen atom, which has been published by you at the site http://search.japantimes.co.jp/cgi-bin/nn20101105a1.html (Fig. 1, a), one should know that the hydrogen atoms exist only in a plasma state at the minimal temperature of nearly 2700 K and the maximal temperature of 10000 K. At the above-mentioned temperatures the electron of the hydrogen atom is in an excited state and transits between the energy levels changing the size of the atom and emitting and absorbing photons. It appears from this that it is impossible to capture the image of a hydrogen atom in a free state. In a free state, it is possible to give its theoretical presentation only. The theoretical model of the hydrogen atom (Fig 1, b) results from the mathematical model (1) of the law of formation of the spectra of the atoms and ions being discovered in the year of 1995 [3]. There is no energy of an orbital motion of the electron in this law, but

there is energy E_b of a linear interaction of the electrons with the protons of the atomic nuclei (2) [1], [2], [3].

$$E_f = E_i - \frac{E_1}{n^2}, \tag{1}$$

where E_f is energy of the photon being emitted by the electron; E_i is energy of ionization of the hydrogen atom; E_1 is binding energy of the hydrogen atom with its proton, which corresponds to the first (unexcited) energy level of the hydrogen atom; n=1, 2, 3,… is the main quantum number.

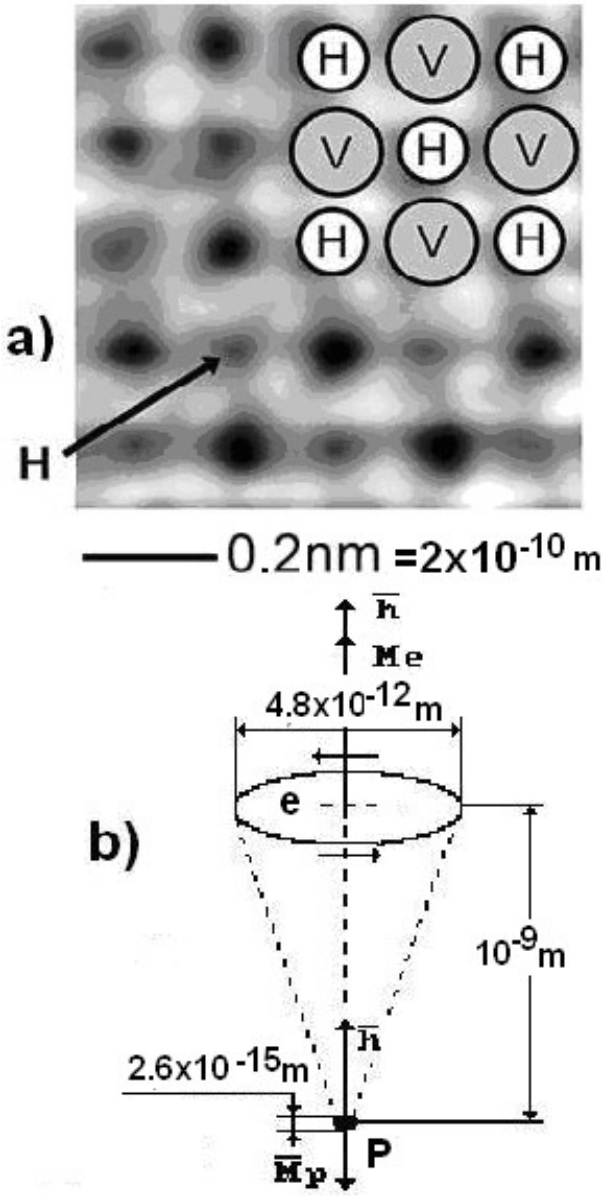

Fig. 1. a) the Japanese photo of the hydrogen atoms **H**;
b) the theoretical model of the hydrogen atom and its dimensions in the unexcited state

Binding energy of the electron with the proton, which corresponds to any energy level of any atom, is determined according to the formula [1], [2], [3]

$$E_b = \frac{E_1}{n^2} = \frac{h\nu_1}{n^2}\ . \tag{2}$$

Energies of the photons being emitted by the electron of the hydrogen atom and other atoms when the electrons transit between the energy levels are calculated according to the formula [1], [2], [3]

$$\Delta E_f = E_f = E_1 \cdot \left[\frac{1}{n_1^2} - \frac{1}{n_2^2} \right]. \quad (3)$$

According to Coulomb's law, if an electron of the hydrogen atom resides at the first energy level (in an unexcited state), a distance between the proton and the electron is [1], [2], [3]

$$R_1 = \frac{e^2}{4\pi \cdot \varepsilon_o \cdot E_1} = \frac{(1.602 \cdot 10^{-19})^2}{4 \cdot 3.142 \cdot 8.854 \cdot 10^{-12} \cdot 13.598 \cdot 1.602 \cdot 10^{-19}} = 1.059 \cdot 10^{-10} m. \quad (4)$$

Dear Professor Yuichi Ikuhara,

The calculated results according to these formulas are given in Table 1. A hydrogen atom model results from these formulas and the calculation results according to these formulas (Fig. 1, b).

Table 1. The hydrogen atom spectrum, the binding energies E_b between the proton and the electron and the distances R_i between them [1], [2]

Values	n	2	3	4	5
E_f (exp)	eV	10.20	12.09	12.75	13.05
E_f (theor)	eV	10.198	12.087	12.748	13.054
E_b (theor)	eV	3.40	1.51	0.85	0.54
R_i (theor)	$\cdot 10^{-10} m$	4.23	9.54	16.94	26.67

As it is clear (Fig. 1, b), the electron of the hydrogen atom interacts with its proton linearly, not orbitally. It is a consequence of an absence of energy of an orbital motion of the electrons in the atoms resulting from the laws of formation of the spectra of the atoms and ions expressed by the mathematical models (1), (2), (3).

The distance between the proton and the electron in the hydrogen atom depends on temperature. An analysis shows that at the usual temperature the electron establishes the bond with another atom and happens to be between the second and the third energy levels of the atomic state (Table 1). It means that in the molecules the distance between the protons and the electron in the hydrogen atom is increased approximately by an order of magnitude and the factor $10^{-10} m$ adopts a value of $\cdot 10^{-9} m$ (Fig. 1, b).

Dear Professor Yuichi Ikuhara,

I hope that you understand the reason why it is impossible to take a photo of the hydrogen atom in a free state. It is possible to take its photo only in the molecule composition; it was performed by the European investigators (Fig. 2) when they tried to take the photo of a cluster of the benzene molecules $\tilde{N}_6 \acute{I}_6$. As you see (Fig. 2), the benzene molecule consists of six carbon atoms and six hydrogen atoms. The photo proves the authenticity of the linear interaction of the electrons of the carbon atoms and the hydrogen atoms and the authenticity of the theoretical model of the hydrogen atom (Fig. 1, b).

Let us pay attention to the theoretical models of the benzene molecule (Fig. 2), its cluster and a photo of this cluster (Fig. 2). The hydrogen clusters are on the external contour of the ben-

zene molecule and its cluster and are connected with the electrons of the carbon atoms linearly. The supermodern European microscope has caught sight of the misty contours of the carbon atoms in the benzene molecule (Fig. 2) and the misty linear ray-path projections on the external contour of the benzene cluster, which belong to the hydrogen atoms in its theoretical model. What has the Japanese microscope managed to see (Fig. 1, a)? It has seen the misty contours of the structures, which forms resemble a square. The white misty tops of these squares are the atoms of the molecules, which form the cluster, which image has been captured by you. The centres of the squares are the hollows, but you have marked them as the atoms of hydrogen and vanadium; it seems that you have supposed that the white misty spots are the orbits of the electrons, and their nuclei are in the centres of the squares. I hope that you understand that your notions differ from more correct notions the European scientists (Fig. 2).

Dear Professor Yuichi Ikuhara,

Let us consider the resolution of the Japanese electron microscope. We should let alone the fairy tales of the relativists that the electrons bring the images of the microworld objects to an electron microscope photo. The photons only are the visual information carriers.

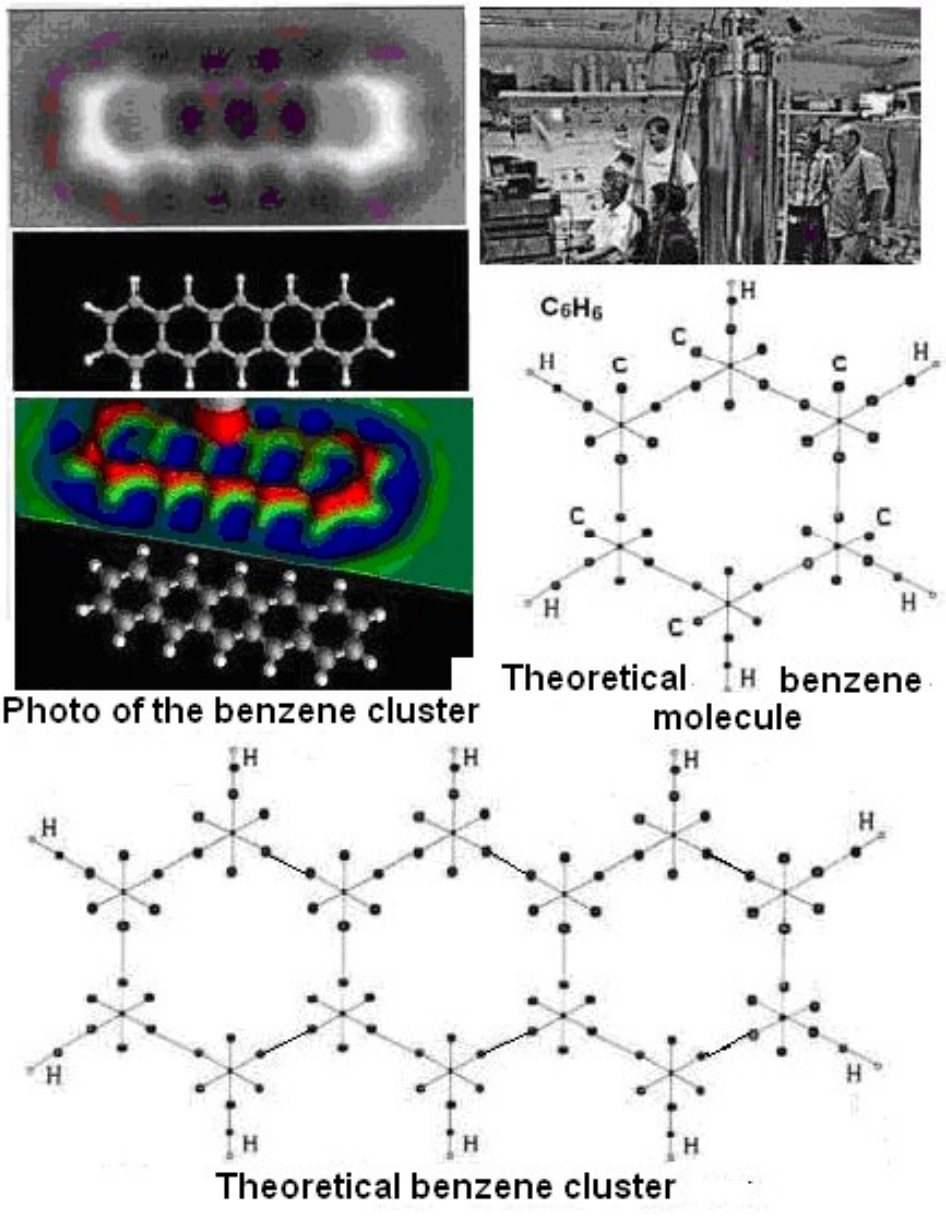

Fig. 2

The resolution of the human eye is known; it can see an object of 0.10 mm or $1.0 \cdot 10^{-4} m$ more or less distinctly. The resolution of the human eye or a camera is stipulated by the density of the photons, which are reflected from the surface of the object being photographed. The greater the density, the greater the image sharpness of the object being investigated. For example, a desk lamp with power of 100 W emits $1.0 \cdot 10^{23}$ photons per second per square centimetre of the desk surface; these photons provide sharpness of the letters of the text, which is read by us and is on the desk surface. It appears from it that a difference between a size of the object ($1.0 \cdot 10^{-4} m$), which is seen distinctly by the human eye, and the sizes of the light photons of $(3.0 \ldots 7.0) \cdot 10^{-7}$ m, which provide image sharpness of this object, is 3 orders of magnitude. It is natural that a decrease of this difference decreases image sharpness of the object being photographed. Nebulosity of the photos of the electron microscopes (Figs 1 and 2) proves it. There is every reason to believe that the difference between the dimensions of the misty objects in the photos and the dimensions of the photons, which have brought the images of these objects, is nearly two orders of magnitude (100fold), and we can determine approximately the radii of these photons (Figs 1 and 2).

Dear Professor Yuichi Ikuhara,

Your have shown a scale line of $2 \cdot 10^{-10} m$ in your photo (Fig. 1, a). A dimension of this line is close to a dimension between the white misty images in the tops of the squares in your photo, which are represented by the atoms of the molecules (in Fig. 2, there the carbon atoms in the tops of the hexagons as in the European photo). The electrons unite the atoms into molecules. The hydrogen atoms can play the role of a junction link. The protons of the hydrogen atoms (Fig. 1, b) take part in the formation of the linear bonds between the atoms in a molecule or a cluster as well. As a result, a dimension of a side of the square $2 \cdot 10^{-10} m$ in your photo (Fig. 1, a) will be at least by two orders of magnitude greater than $10^{-8} m$. It means that you have overrated the resolution of your microscope by 100fold at least. It appears from this that the images of the misty objects in your photos have been brought by the photons, which dimensions are nearly $10^{-10} \ldots 10^{-11} m$. They are the photons from the roentgen band (Table 2), which, as it is known, are reflected from the electrons in Compton effect, but they are not reflected from the protons of the hydrogen atoms, which dimensions are by 4 orders of magnitude less than the dimensions of the roentgen photons. An absence of the images at the ends of the linear projections of the benzene molecules (photo in Fig. 2) where the protons of the hydrogen atoms are situated proves it [1], [2].

Table 2. Bands of the electromagnetic radiation scale

Bands	Radii (wave-lengths), $r = \lambda$, m	Oscillation frequency, $\nu \quad c^{-1}$
1. Low- frequency band	$3 \cdot 10^{6} \ldots 3 \cdot 10^{4}$	$10^{1} \ldots 10^{4}$
2. Broadcast band	$3 \cdot 10^{4} \ldots 3 \cdot 10^{-1}$	$10^{4} \ldots 10^{9}$
3. Microwave band	$3 \cdot 10^{-1} \ldots 3 \cdot 10^{-4}$	$10^{9} \ldots 10^{12}$
4. Relic band (max)	$r = \lambda \approx 1 \cdot 10^{-3}$	$3 \cdot 10^{11}$
5. Infrared band	$3 \cdot 10^{-4} \ldots 7.7 \cdot 10^{-7}$	$10^{12} \ldots 3.9 \cdot 10^{14}$
6. Light band	$7.7 \cdot 10^{-7} \ldots 3.8 \cdot 10^{-7}$	$3.9 \cdot 10^{14} \ldots 7.9 \cdot 10^{14}$
7. Ultraviolet band	$3.8 \cdot 10^{-7} \ldots 3 \cdot 10^{-9}$	$7.9 \cdot 10^{14} \ldots 1 \cdot 10^{17}$
8. Roentgen band	$3 \cdot 10^{-9} \ldots 3 \cdot 10^{-12}$	$10^{17} \ldots 10^{20}$
9. Gamma band	$3 \cdot 10^{-12} \ldots 3 \cdot 10^{-18}$	$10^{20} \ldots 10^{24}$

CONCLUSION

The above-mentioned facts demonstrate a backwardness of the theoretical knowledge in physics, which inhibits scientific development, but instead of an attempt to find a way to solve

the problem, the punditry creates false committees in order to struggle against those who wish to solve the problem. The situation resembles the one, which took place in the Middle Ages, when the inquisition struggled against new knowledge being unable to understand that it is unconquerable [1], [2].

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