TO VICTOR AMBARTSUMIAN ON HIS 80TH BIRTHDAY

S. Chandrasekhar

It is a privilege to join Academician Victor Ambartsumian's many friends and colleagues all over the world in congratulating him on his eightieth birthday and to express gratitude for a lifetime of efforts towards scientific ends. The only other astronomer of this century who compares with Academician Ambartsumian in his constancy and devotion to astronomy is Professor Jan Oort; but they would appear to be dissimilar in every other way. It will be a worthy theme for a historian of science of the twenty-first century to compare and contrast these two great men of science.

Academician Ambartsumian's realm does not divide astronomy and astrophysics into its conventional parts: theoretical and observational. He is an astronomer par excellence.

As one whose main interests during the past thirty or more years have been outside the mainstream of astronomy, the task of writing an essay encompassing all of Ambartsumian's wide range of accomplishments is outside the circumference of my comprehension. And since many others more conversant than I will be writing about him for this issue, perhaps I may recall some of Ambartsumian's discoveries which reveal the elegance and clarity of his ideas.

1. One of Ambartsumian's earliest papers was concerned with Zanstra's method of determining the temperature of the central star illuminating a planetary nebula. Here is Ambartsumian's formulation which led to a first treatment of the radiative equilibrium of a planetary nebula:

There is a probability, p, that an ultraviolet light quantum (that is a quantum beyond the head of the Lyman series) will be transformed into a Lyman-alpha quantum by the process of ionization and recombination followed by cascades: a simple statement that succinctly epitomizes Zanstra'a idea.

2. The "blanketing" effect of absorption lines, in warming a stellar atmosphere, can be formulated in a first approximation by postulating that in a given frequency interval there is a probability, p, that an absorption line will occur. With such a formulation, the equations of radiative transfer governing thermodynamic equilibrium can be readily written down; and one obtains a satisfactory theory for the underlying phenomenon.

3. The formulation of the principles of invariance in the theory of radiative transfer: a theoretical innovation that is of the greatest significance. Many papers were contributed to a symposium on this topic at Byurakan in the fall of 1982; and in my contribution to that symposium I narrated the influence of Academician Ambartsumian's ideas on my own related work.

4. Ambartsumian's marvelously elegant formulation of the fluctuations in brightness in the Milky Way: in the limit of infinite optical depth, the probability distribution of the fluctuations in the brightness of the Milky Way is invariant to the location of of the observer. In the related series of investigations, in part in association with Academician Markarian, Ambartsumian introduced for the first time the now commonly accepted notion that interstellar matter occurs in the form of clouds.

5. Ambartsumian's discovery of the role of the escape of stars from galactic clusters resulting from the relatively short times of relaxation is as simple as it is profound.

6. Ambartsumian's recognition of stellar association as a dynamical entity with far-reaching implications for subsequent theories relating to star formation. I recall the scepticism with which his ideas were received when I first gave an account of

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University of Chicago, The Enrico Fermi Institute, USA. Published in English in Astrofizika, Vol. 29, No. 1, pp. 7-8, July-August, 1988 and republished here with minor editorial changes.

 0571-7256/88/2901-0408$12.50

Ambartsumian's ideas at a colloquium at the Yerkes Observatory late in 1946.

It was about this time that my own interests began to diverge from astronomy. But I am aware of Ambartsumian's founding of the Byurakan Observatory in Armenia, of the extremely important work that continues to be carried out at the Observatory, including of course Markarian's brilliant work on the discovery and cataloging of galaxies known by his name; and of the discovery and of the prevalence of flare stars.

There can be no more than two or three astronomers in this century who can look back on a life so worthily devoted to the progress of astronomy. It is a privilege to have known him and to wish him the very best on his reaching his eightieth birthday.

VICTOR AMBARTSUMIAN AND THE IAU

Jean-Claude Pecker

Few astronomers have had such a deep influence as Victor Ambartsumian has had on the life of the international bodies devoted to the promotion and defense of astronomy and science in general. I remember that, years ago someone asked me whether I was spending more time in astrophysical research or in teaching. I told him that the divisions of astronomical activity were not the ones he implied: there is astrometry on one side and astrophysics on the other side, but astropolitics is possibly, for some of us, the most important part of all. Professor Ambartsumian has been exemplary, in the sense that, a very active and productive astrophysicist himself, he entered into astropolitics without doing any harm to his scientific output.

President of the International Astronomical Union from 1961 to 1964, past-president and councilor of the Executive Committee from 1964 to 1967 then he became President-elect of the ICSU, and president of ICSU from 1970 to 1974: a record difficult to achieve and possibly unpaired amongst astronomers!

I had met Professor Ambartsumian much earlier indeed. He was amongst the few Soviet astronomers who visited France immediately after the Second World War and he came to our country on several occasions since. But, of course, the IAU was an ideal place to meet. First it took place in Rome, in 1952, at the General Assembly of the IAU. At that time, I witnessed the brilliant intuitions of Ambartsumian. It was the far-reaching discovery of O and T associations, the recognition of the importance in stellar births of explosive events, the studies of active galaxies... and in a quite different field, the celebrated invariance methods applied to solve difficult transfer problems. And, in 1958, in Moscow, as a guest to the Tenth General Assembly, Professor Ambartsumian expressed his ideas in the most enthusiastic way, as such:

"En faisant la part qui leur est due aux perfectionnements des moyens d'observations, je voudrais toutefois souligner l'importance décisive des recherches théoriques. Pendant les années qui se sont écoulées aprés l'Assemblée de Dublin, la théorie a compté de grands succés à son actif. Cependant, nous vivons à une époque où l'on peut imposer à la théorie de plus hautes exigences.

Je suis profondément convaincu que nous touchons à une étape du développement de l'astrophysique qui nous ouvre de nouvelles propriétés de la matière, qui ne pouvaient étre mises à jour dans les conditions qui existent dans les laboratoires terrestres. En d'autres termes, je voudrais dire que de nombreux phénoménes et lois de la physique stellaire que nous avons établies par voie empirique, à l'aide d'observations astronomiques, ne pourront étre expliques que par suite d'un approfondissement des conceptions de la physique théorique moderne.

Parmi les phénomènes qui exigent des efforts particulièrement grands des théoriciens et qui sont des problèmes de base de l'astronomie moderne, il faut citer, par exemple: 1) Le problème des étoiles non-stables. 2) Le problème des explosions des supernovae. 3) Le problème de l'origine des jeunes groupes stellaires. 4) Le problème de la formation

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Collège de France, Paris, France. Published in English in Astrofizika, Vol. 29, pp. 9-14, July-August, 1988 and republished here with minor editorial changes.

0571-7256/88/2901-0409$12.50